NATIONAL POLAR-ORBITING OPERATIONAL ENVIRONMENTAL SATELLITE SYSTEM (NPOESS)

NPOESS Common Data Format Control Book - External Volume III – SDR/TDR Formats
D34862-03 Rev E
CDRL No. A014

Northrop Grumman Space & Mission Systems Corporation
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D	5/27/2009	The following changes have been made with ECR 958C: • Corrected description of ATMS Remapped to CrIS QF4 • Added “SDR” suffix to ATMSREMAP quality flags • Added CrIS array dimension clarifications • Added PadBytes to all ATMS and CrIS Geolocations • Added SARSAT SDRs • Noted Reflectance Calibration includes terrain corrected solar angles and radiances are not corrected for OOB contributions • Removed Bad Detector QF from VIIRS DNB • Removed “Mixed” from VIIRS ModeScan flags • UML Updates • Editorial corrections	34,41, 50,56,57, 60, 82, 89-90, 248–286, 285, 286, 345, 347, 351, 281, 299, 309, 327, 334, 349, 40, 49, 88, 339, 359, 49, 59, 103, 175

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1.0 INTRODUCTION

1.1 Document Purpose and Scope

The Common Data Format Control Book – External (CDFCB-X) Volume III contains the specifications for the format of Sensor Data Records (SDRs) and Temperature Data Records (TDRs). This specification includes the format of the Hierarchical Data Format Release 5 (HDF5) files, as well as the product definitions. These formats are available to external users of the National Polar-orbiting Operational Environmental Satellite System (NPOESS). For an overview of the CDFCB-X and the list of reference documents, see the CDFCB-X Volume I-Overview, D34862-01.

1.2 Document Overview

The sections of this volume are organized in the following manner:

Section 1.0: Introduction – Provides a brief overview of the document's purpose and scope.

Section 2.0: Sensor Data Records Content – Provides a description of the contents of each NPOESS SDR.

Section 3.0: Temperature Data Records Content – Provides a description of the contents of each NPOESS TDR.

Within Sections 2.0 and 3.0, each instrument's SDR/TDR is described using a series of sub-sections: A general data content summary, product profile representation, and HDF5 details; geolocation data content summary and geolocation product profile (where applicable).

Within each data content summary table, granule parameters are listed with their respective field names, data types, dimension sizes, and units. For the aggregation dimension size, an "N" is indicative of the number of granules that would occur within a delivered file's aggregation. For example, [N*3] would indicate an array size of 300 if 100 granules were aggregated in the file.

Within the product profile table, the granule is described using the XML product profile supplied with the data set. More information on product profiles and definitions of table headings can be found in CDFCB-X, Volume V – Metadata, D34862-05. A general

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discussion of the HDF5 file and product profiles can be found in CDFCB-X, Volume I – Overview, D34862-01.

In Section 2.2, SDR HDF5 Structure, a Unified Modeling Language (UML) diagram outlines the structure of the HDF5 file for SDRs. Each class within the structure can contain a set of metadata attributes. These attributes are defined in more detail in the CDFCB-X Volume V – Metadata, D34862-05.

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2.0 SENSOR DATA RECORDS

SDR processing is instrument-specific and is an event-driven process. All instrument data required to create an SDR granule is contained within relevant Raw Data Record (RDR) granule(s). Processing an RDR into an SDR involves unpacking and de-commutating the Application Packet (AP) data, as necessary, applying calibration (radiometric, geometric, engineering), and finally geo-locating, as needed, using ephemeris and attitude information and earth model information.

An SDR contains the following:

- Calibrated sensor data
- Geolocation data (where applicable)
- Quality flags
- Metadata at the granule and aggregation level

2.1 DELETED

2.2 Sensor Data Records and Temperature Data Records HDF5 Details

Figure 2.2-1, Generalized UML Diagram for HDF5 SDR/TDR Files, depicts the HDF5 SDR/TDR organization as a Unified Modeling Language (UML) class diagram. Each HDF5 SDR/TDR file contains an HDF5 Root Group, '/', a Data Products Group, Product Groups (Collection Short Name), an optional Geolocation Group (depending upon packaging option, see the CDFCB-X Volume I for a description of the geolocation packaging), and an All Data Group (dataset arrays). The Product Groups and Geolocation Group both contain datasets – an Aggregation Dataset (Collection Short Name_Aggr) and Granule Datasets (Collection Short Name_Gran_n) – where n indicates the nth granule in a temporal aggregation of granules (1 .. n). A granule is a general term used to describe the minimum quanta of data collected per processing period, generally on the order of seconds. For the definition and organization of the metadata attributes contained in the HDF5 files, see the CDFCB-X Volume V – Metadata, D34862-05. Attributes that are specific to a particular SDR/TDR are listed with the specific SDR/TDR's data format definition. For the generalized formats and packaging options for the Geolocation data, see the CDFCB-X Volume I – Overview.

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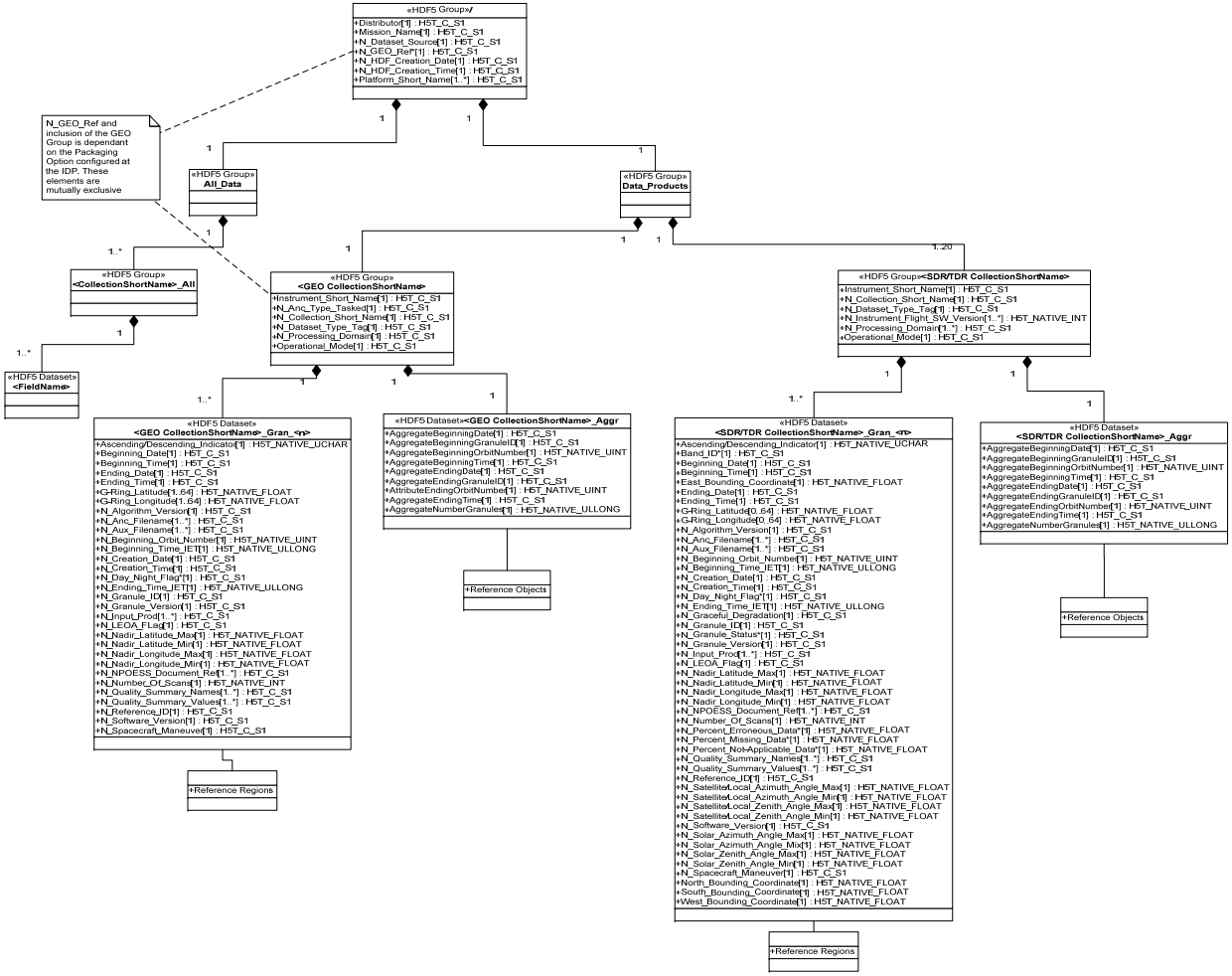

Figure 2.2-1, Generalized UML Diagram for HDF5 SDR/TDR Files

2.3 SDR Granule Size

The granule sizes for SDRs given below are not absolute over the life of the sensor. Application software will need to determine the SDR array size by using the HDF5 software API.

The SDR granule is the smallest component of an HDF5 aggregation. Each HDF5 file will be composed of an aggregation of contiguous granules covering the time period specified in a request (the range being from one granule to the total number of granules in one orbit). To correctly use the HDF5 SDR files, operational software will need to determine the SDR array size by examining the appropriate HDF5 API's returned values per granule, or aggregation, as desired. The estimated size for each SDR granule is given in the SDR Data Unit Format.

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2.4 Advanced Technology Microwave Sounder SDR

Data Mnemonic	SDRE-ATMS-C0030
Description/ Purpose	Advanced Technology Microwave Sounder (ATMS) sensor data calibrated to support Environmental Data Record (EDR) generation. Data from ATMS, along with processing coefficients and spacecraft attitude and ephemeris, are processed by the ATMS Sensor Data Record (SDR) routines to produce geolocated, corrected, calibrated scene brightness temperatures. ATMS and Cross-track Infrared Sounder (CrIS) SDRs are used by the Cross-track Infrared Microwave Sounder Suite (CrIMSS) EDR processors to produce CrIMSS EDRs. ATMS rotates three times every 8 seconds resulting in three scans for every single scan of CrIS. For optimal performance within the NPOESS processing system, the length of each ATMS granule is set to 32 seconds, which is equivalent to 12 scans. ATMS rotates counter-clockwise (w.r.t. the positive velocity direction) producing 104 views, with each view taking approximately 18 milliseconds. 96 earth view brightness temperatures are reported in the SDR for each of the 22 channels. As part of the normal ATMS calibration process, there are also four “cold” space views and four “warm” target views. Noise-Equivalent delta Temperatures (NEdT) are reported for each of the calibration views. Quality Flags: There are two “warm” calibration targets --one for K, Ka, and V-bands (KAV Target) and one for W and G-band (WG Target). The KAV target has eight Platinum Resistance Thermistors (PRT) and the WG target has seven PRTs. Also, each of the four shelf receivers has a PRT: one for each K/Ka, V, W, and G Bands. In all quality flags which reference PRTs, the least significant bit (lsb) of the 8 bit quality flag corresponds to the 1st item (e.g. PRT #1 or K/Ka). For quality flags which reference space views, the lsb corresponds to the first space view.
File-Naming Construct	See the CDFCB-X Volume I, D34862-01, Section 3.0 for details.
File Size	Approximately 63 KiB per data granule. Approximately 82 KiB per geolocation granule. Sizes do not include HDF5 overhead or metadata.
File Format Type	HDF5
Data Content and Data Format	See Section 2.4.1, ATMS SDR Data Content Summary. See Section 2.4.5, ATMS SDR Geolocation Content Summary

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2.4.1 ATMS SDR Product Data Content Summary

Table 2.4.1-1, ATMS Product Data Content Summary

Name	Description	Data Type	Aggregate Dimension (N = Number of Granules)	Granule Dimension	Units
BeamTime	The time in IET of the end of the view period for this observation	64-bit integer	[N*12, 96]	[12, 96]	microsecond
BrightnessTemperature	Calibrated scene brightness temperature for each ATMS channel and beam position. This output is the Rayleigh equivalent temperature.	unsigned 16-bit integer	[N*12, 96, 22]	[12, 96, 22]	kelvin
NEdTCold	Noise-equivalent delta Temperature while viewing cold space	32-bit floating point	[N*12, 22]	[12, 22]	kelvin
NEdTWarm	Noise-equivalent delta Temperature while viewing warm target	32-bit floating point	[N*12, 22]	[12, 22]	kelvin
GainCalibration	Gain factor used in calibrating earth scene brightness temperatures	32-bit floating point	[N*12, 22]	[12, 22]	kelvin
InstrumentMode	Instrument mode word 73 in the Health & Status APID 531	unsigned 16-bit integer	[N*4]	[4]	unitless
QF1_GRAN_HEALTHSTATUS	Out of range quality flag for 8 second health and status packet	unsigned 8-bit char	[N*4]	[4]	unitless
QF2_GRAN_HEALTHSTATUS	Out of range quality flag for 8 second health and status packet	unsigned 8-bit char	[N*4]	[4]	unitless
QF3_GRAN_HEALTHSTATUS	Out of range quality flag for 8 second health and status packet	unsigned 8-bit char	[N*4]	[4]	unitless
QF4_GRAN_HEALTHSTATUS	Out of range quality flag for 8 second health and status packet	unsigned 8-bit char	[N*4]	[4]	unitless
QF5_GRAN_HEALTHSTATUS	Out of range quality flag for 8 second health and status packet	unsigned 8-bit char	[N*4]	[4]	unitless
QF6_GRAN_HEALTHSTATUS	Out of range quality flag for 8 second health and status packet	unsigned 8-bit char	[N*4]	[4]	unitless

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Name	Description	Data Type	Aggregate Dimension (N = Number of Granules)	Granule Dimension	Units
QF7_GRAN_HEALTHSTATUS	Out of range quality flag for 8 second health and status packet	unsigned 8-bit char	[N*4]	[4]	unitless
QF8_GRAN_HEALTHSTATUS	Out of range quality flag for 8 second health and status packet	unsigned 8-bit char	[N*4]	[4]	unitless
QF9_GRAN_HEALTHSTATUS	Out of range quality flag for 8 second health and status packet	unsigned 8-bit char	[N*4]	[4]	unitless
QF10_GRAN_HEALTHSTATUS	Out of range quality flag for 8 second health and status packet	unsigned 8-bit char	[N*4]	[4]	unitless
QF11_GRAN_QUADRATICCORRECTION	Quadratic correction applied to the radiometric transfer function for non-linearity correction.	unsigned 8-bit char	[N]	[1]	unitless
QF12_SCAN_KAVPRTCONVERR	If a divide-by-zero condition exists, or if computation loop fails to converge in the temperature computations for the 8 KAV PRTs, the condition is flagged by the corresponding bit in the flag to indicate which PRT has failed.	unsigned 8-bit char	[N*12]	[12]	unitless
QF13_SCAN_WGPRTCONVERR	If a divide-by-zero condition exists, or if computation loop fails to converge in the temperature computations for the 7 WG PRTs, the condition is flagged by the corresponding bit in the flag to indicate which PRT has failed.	unsigned 8-bit char	[N*12]	[12]	unitless

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Name	Description	Data Type	Aggregate Dimension (N = Number of Granules)	Granule Dimension	Units
QF14_SCAN_SHELFPRTCONVERR	If a divide-by-zero condition exists, or if the computation loop fails to converge in the temperature computations for the 4 Receiver Shelf (KKa, V, W and G) PRTs, the condition is flagged by the corresponding bit in the flag to indicate which PRT has failed.	unsigned 8-bit char	[N*12]	[12]	unitless
QF15_SCAN_KAVPRTTEMPLIMIT	Each of the 8 KAV PRT temperatures is checked against a lower limit and an upper limit. Out of range conditions are flagged by the corresponding bit in the flag to indicate which PRT has failed the test.	unsigned 8-bit char	[N*12]	[12]	unitless
QF16_SCAN_WGPRTTEMPLIMIT	Each of the 7 WG PRT temperatures is checked against a lower limit and an upper limit. Out of range conditions are flagged by the corresponding bit in the flag to indicate which PRT has failed the test.	unsigned 8-bit char	[N*12]	[12]	unitless
QF17_SCAN_KAVPRTTEMPCONSISTENCY	The 8 KAV PRT temperatures are checked against each other for consistency. The check failure shall be flagged by the corresponding bit in the flag to indicate which PRT has failed the test.	unsigned 8-bit char	[N*12]	[12]	unitless

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Name	Description	Data Type	Aggregate Dimension (N = Number of Granules)	Granule Dimension	Units
QF18_SCAN_WGPRTTEMPCONSISTENCY	The 7 WG PRT temperatures are checked against each other for consistency. The check failure shall be flagged by the corresponding bit in the flag to indicate which PRT has failed the test.	unsigned 8-bit char	[N*12]	[12]	unitless
QF19_SCAN_ATMSSDR	Scan-level Quality Flag	unsigned 8-bit char	[N*12]	[12]	unitless
QF20_ATMSSDR	Scan-level Quality Flag per channel	unsigned 8-bit char	[N*12, 22]	[12, 22]	unitless
QF21_ATMSSDR	Out of range - Space and Blackbody View Quality Flag	unsigned 8-bit char	[N*12, 22]	[12, 22]	unitless
QF22_ATMSSDR	Space and Blackbody View Quality Flag	unsigned 8-bit char	[N*12, 22]	[12, 22]	unitless
PadByte1	Pad byte	unsigned 8-bit char	[N*7]	[7]	unitless
BrightnessTemperatureFactors	Scale = first array element; offset = second array element	32-bit floating point	[N*2]	[2]	Scale = unitless; Offset = kelvin

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2.4.2 ATMS SDR Product Profile

Table 2.4.2-1, ATMS SDR Product Profile

Name	Data Size	Dimensions
BeamTime	8byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	12	12
BeamPosition	No	No	96	96

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
The time in IET of the end of the view period for this observation	0			microsecond	No		64-bit integer	NA_INT64_FILL	-999		
								MISS_INT64_FILL	-998		
								ERR_INT64_FILL	-995		
								VDNE_INT64_FILL	-993		

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	12	12
BeamPosition	No	No	96	96
Channel	No	No	22	22

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Calibrated scene brightness temperature for each ATMS channel and beam position. This output is the Rayleigh equivalent	0			kelvin	Yes	Brightness Temperature Factors	unsigned 16-bit integer	NA_UINT16_FILL	65535		
								MISS_UINT16_FILL	65534		
								ERR_UINT16_FILL	65531		
								VDNE_UINT16_FILL	65529		
								SOUB_UINT16_FILL	65528		

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		temperature.

NEdTCold — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	12	12
Channel	No	No	22	22

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Noise equivalent delta Temperature while viewing cold space	0			kelvin	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

NEdTWarm — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	12	12
Channel	No	No	22	22

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Noise-equivalent delta Temperature while viewing warm target	0			kelvin	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

GainCalibration — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	12	12
Channel	No	No	22	22

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Gain factor used in calibrating	0			kelvin	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		

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		earth scene brightness temperatures								ERR_FLOAT32_FILL VDNE_FLOAT32_FILL	-999.5 -999.3	
InstrumentMode	2byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**						
		Status	Yes	No	4	4						
		Datum										
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**	**Legend Entries**	
		Instrument mode word 73 in the Health & Status APID 531	0			unitless	No		unsigned 16 bit integer	**Name** **Value**	**Name** **Value**	

Table 2.4.2-2, ATMS SDR Product Profile - Quality Flags

Name	Data Size	Dimensions
QF1_GRAN_HEALTHSTATUS	1byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Time	Yes	No	4	4

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend	Entries
Spare	0			unitless	No		1 bit(s)	Name	Value	Name	Value
SPA_P5V_A_VMON or SPA_P5V_B_VMON health check failed	1			unitless	No		1 bit(s)	Name	Value	Name False True	Value 0 1
SPA_P15V_A_VMON or SPA_P15V_B_VMON health check failed	2			unitless	No		1 bit(s)	Name	Value	Name False True	Value 0 1
SPA_N15V_A_VMON or SPA_N15V_B_VMON health check failed	3			unitless	No		1 bit(s)	Name	Value	Name False True	Value 0 1
RCV_P6V_RF_VMON health check failed	4			unitless	No		1 bit(s)	Name	Value	Name False True	Value 0 1
RCV_P12V_RF2_VMON health check failed	5			unitless	No		1 bit(s)	Name	Value	Name False True	Value 0 1
RCV_P15V_RF_VMON health check failed	6			unitless	No		1 bit(s)	Name	Value	Name False True	Value 0 1
RCV_N15V_RF_VMON health check failed	7			unitless	No		1 bit(s)	Name	Value	Name False True	Value 0 1

QF2_GRAN_HEALTHSTATUS 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Time	Yes	No	4	4

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries

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		RCV_P15V_ANA_VMON health check failed	0			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1	
		RCV_N15V_ANA_VMON health check failed	1			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1	
		K_RFE_PRT health check failed	2			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1	
		KA_RFE_PRT health check failed	3			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1	
		V_RFE_PRT health check failed	4			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1	
		V_PRI_PLO_PRT health check failed	5			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1	
		V_RED_PLO_PRT health check failed	6			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1	
		V_IF_PRT health check failed	7			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1	
QF3_GRAN_HEALTHSTATUS	1byte(s)	**Name** / Time	**Granule Boundary** / Yes	**Dynamic** / No	**Min Array Size** / 4	**Max Array Size** / 4						
		Datum										
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**	**Legend Entries**	
		W_RFE_PRT health check failed	0			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1	
		SAW_FILT_PRT health check failed	1			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1	
		W_IF_PRT health check failed	2			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1	

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		W_PRI_GDO_PRT health check failed	3			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1	
		W_RED_GDO_PRT health check failed	4			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1	
		G_PRI_CSO_PRT health check failed	5			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1	
		G_RED_CSO_PRT health check failed	6			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1	
		G1_IF_PRT health check failed	7			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1	
QF4_GRAN_HEALTHSTATUS	1byte(s)	**Name** / Time	**Granule Boundary** / Yes	**Dynamic** / No	**Min Array Size** / 4	**Max Array Size** / 4						
		Datum										
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**	**Legend Entries**	
		G2_IF_PRT health check failed	0			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1	
		W_SHELF_PRT health check failed	1			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1	
		KKA_SHELF_PRT health check failed	2			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1	
		G_SHELF_PRT health check failed	3			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1	
		V_SHELF_PRT health check failed	4			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1	
		RCVPS_A_PRT health check failed	5			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1	

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		RCVPS_B_PRT health check failed	6			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1		
		OCXO_PRI_PRT health check failed	7			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1		
QF5_GRAN_HEALTHSTATUS	1byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**							
		Time	Yes	No	4	4							
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**	**Legend Entries**		
		OCXO_RED_PRT health check failed	0			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1		
		DSPA_1553_PRT health check failed	1			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1		
		DSPB_1553_PRT health check failed	2			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1		
		SPA_PS_A_PRT health check failed	3			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1		
		SPA_PS_B_PRT health check failed	4			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1		
		DSPA_PROC_PRT health check failed	5			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1		
		DSPB_PROC_PRT health check failed	6			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1		
		SD_MECH_TEMP health check failed	7			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1		
QF6_GRAN_HEALTHSTATUS	1byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**							
		Time	Yes	No	4	4							
		Datum											

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		Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
		SD_PS_PRT health check failed	0			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
		V_PLO_A_LOCK_VMON health check failed	1			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
		V_PLO_B_LOCK_VMON health check failed	2			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
		HK_2WREST1_A or HK_2WREST1_B health check failed	3			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
		HK_2WREST2_A or HK_2WREST2_B health check failed	4			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
		4W_GND_A or 4W_GND_B health check failed	5			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
		2W_GND_A or 2W_GND_B health check failed	6			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
		VD_REF_A or VD_REF_B; Module 1 health check failed	7			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
QF7_GRAN_HEALTHSTATUS	1byte(s)										

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Time	Yes	No	4	4

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
VD_REF_A or VD_REF_B; Module 2 health check failed	0			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1

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		VD_REF_A or VD_REF_B; Module 3 health check failed	1			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1	
		VD_REF_A or VD_REF_B; Module 4 health check failed	2			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1	
		VD_GND_A or VD_GND_B; Module 1 health check failed	3			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1	
		VD_GND_A or VD_GND_B; Module 2 health check failed	4			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1	
		VD_GND_A or VD_GND_B; Module 3 health check failed	5			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1	
		VD_GND_A or VD_GND_B; Module 4 health check failed	6			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1	
		SD_P5V_VMON health check failed	7			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1	
QF8_GRAN_HEALTHSTATUS	1byte(s)	**Name** / Time	**Granule Boundary** / Yes	**Dynamic** / No	**Min Array Size** / 4	**Max Array Size** / 4						
		Datum										
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**	**Legend Entries**	
		SD_P12V_VMON health check failed	0			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1	
		SD_N12V_VMON health check failed	1			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1	
		MAIN_MOTOR_CUR health check failed	2			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1	
		COMP_MOTOR_CUR health check failed	3			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1	

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		RESOLVER_VMON health check failed	4			unitless	No		1 bit(s)	Name Value	Name	Value
											False	0
											True	1
		SD_MAIN_MOTOR_VEL health check failed	5			unitless	No		1 bit(s)	Name Value	Name	Value
											False	0
											True	1
		SD_COMP_MOTOR_VEL health check failed	6			unitless	No		1 bit(s)	Name Value	Name	Value
											False	0
											True	1
		SD_MAIN_LOOP_ERROR health check failed	7			unitless	No		1 bit(s)	Name Value	Name	Value
											False	0
											True	1
QF9_GRAN_HEALTHSTATUS	1byte(s)												

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Time	Yes	No	4	4

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
SD_MAIN_LOOP_INT_ERROR health check failed	0			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
SD_MAIN_LOOP_VEL_ERROR health check failed	1			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
SD_COMP_LOOP_ERROR health check failed	2			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
SD_MAIN_MOTOR_REQ_VOLTAGE health check failed	3			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
SD_COMP_MOTOR_REQ_VOLTAGE health check failed	4			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
SD_FEED_FORWARD_VOLTAGE health check failed	5			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
COMP_MOTOR_POS health check failed	6			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1

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		Spare	7			unitless	No		1 bit(s)	Name Value	Name Value	

QF10_GRAN_HEALTHSTATUS — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Time	Yes	No	4	4

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Spare	0			unitless	No		8 bit(s)	Name Value	Name Value

QF11_GRAN_QUADRATICCORRECTION — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	1	1

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Quadratic correction applied to the radiometric transfer function for non-linearity correction.	0			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
Spare	1			unitless	No		7 bit(s)	Name Value	Name Value

QF12_SCAN_KAVPRTCONVERR — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	12	12

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Divide-by-zero condition or computation loop failed to converge in the K/Ka and V (KAV) Band PRT #1 temperature computation.	0			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
Divide-by-zero condition or computation loop failed to converge in the K/Ka and V (KAV) Band PRT #2 temperature computation.	1			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
Divide-by-zero condition or computation loop failed to converge in the K/Ka and V (KAV) Band PRT #3 temperature computation.	2			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
Divide-by-zero condition or computation loop failed to converge in the K/Ka and V (KAV) Band PRT #4 temperature computation.	3			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1

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		Divide-by-zero condition or computation loop failed to converge in the K/Ka and V (KAV) Band PRT #5 temperature computation.	4			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
		Divide-by-zero condition or computation loop failed to converge in the K/Ka and V (KAV) Band PRT #6 temperature computation.	5			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
		Divide-by-zero condition or computation loop failed to converge in the K/Ka and V (KAV) Band PRT #7 temperature computation.	6			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
		Divide-by-zero condition or computation loop failed to converge in the K/Ka and V (KAV) Band PRT #8 temperature computation.	7			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
QF13_SCAN_WGPRTCONVERR	1byte(s)										

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	12	12

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Divide-by-zero condition or computation loop failed to converge in the WG Band PRT #1 temperature computation.	0			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
Divide-by-zero condition or computation loop failed to converge in the WG Band PRT #2 temperature computation.	1			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
Divide-by-zero condition or computation loop failed to converge in the WG Band PRT #3 temperature computation.	2			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
Divide-by-zero condition or computation loop failed to converge in the WG Band PRT #4 temperature computation.	3			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
Divide-by-zero condition or computation loop failed to converge in the WG Band PRT #5 temperature computation.	4			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
Divide-by-zero condition or computation loop failed to converge in the WG Band PRT #6 temperature computation.	5			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
Divide-by-zero condition or computation loop failed to converge in the WG Band	6			unitless	No		1 bit(s)	Name Value	Name Value False 0

		PRT #7 temperature computation.									True	1
		Spare	7									

QF14_SCAN_SHELFPRTCONVERR — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	12	12

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values (Name / Value)	Legend Entries (Name / Value)
Divide-by-zero condition or computation loop failed to converge in the K/Ka, V, W, G Band Receiver Shelf PRT K temperature computation.	0			unitless	No		1 bit(s)		False 0 True 1
Divide-by-zero condition or computation loop failed to converge in the K/Ka, V, W, G Band Receiver Shelf PRT V temperature computation.	1			unitless	No		1 bit(s)		False 0 True 1
Divide-by-zero condition or computation loop failed to converge in the K/Ka, V, W, G Band Receiver Shelf PRT W temperature computation.	2			unitless	No		1 bit(s)		False 0 True 1
Divide-by-zero condition or computation loop failed to converge in the K/Ka, V, W, G Band Receiver Shelf PRT G temperature computation.	3			unitless	No		1 bit(s)		False 0 True 1
Spare	4			unitless			4 bit(s)		

QF15_SCAN_KAVPRTTEMPLIMIT — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	12	12

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values (Name / Value)	Legend Entries (Name / Value)
Out of range condition for the K/Ka and V Band PRT #1 temperatures.	0			unitless	No		1 bit(s)		False 0 True 1
Out of range condition for the K/Ka and V Band PRT #2 temperatures.	1			unitless	No		1 bit(s)		False 0 True 1
Out of range condition for the K/Ka and V Band PRT #3 temperatures.	2			unitless	No		1 bit(s)		False 0 True 1

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		Out of range condition for the K/Ka and V Band PRT #4 temperatures.	3			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
		Out of range condition for the K/Ka and V Band PRT #5 temperatures.	4			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
		Out of range condition for the K/Ka and V Band PRT #6 temperatures.	5			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
		Out of range condition for the K/Ka and V Band PRT #7 temperatures.	6			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
		Out of range condition for the K/Ka and V Band PRT #8 temperatures.	7			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
QF16_SCAN_WGPRTTEMPLIMIT	1byte(s)										

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	12	12

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Out of range condition for the WG Band PRT #1 temperatures.	0			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
Out of range condition for the WG Band PRT #2 temperatures.	1			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
Out of range condition for the WG Band PRT #3 temperatures.	2			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
Out of range condition for the WG Band PRT #4 temperatures.	3			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
Out of range condition for the WG Band PRT #5 temperatures.	4			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
Out of range condition for the WG Band PRT #6 temperatures.	5			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1

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		Out of range condition for the WG Band PRT #7 temperatures.	6			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1		
		Spare	7			unitless	No		1 bit(s)	Name Value	Name Value		
QF17_SCAN_KAVPRTTEMPCONSISTENCY	1byte(s)	Name: Scan; Granule Boundary: Yes; Dynamic: No; Min Array Size: 12; Max Array Size: 12											
		Datum											
		Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries		
		KAV PRT #1 temperature inconsistency	0			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1		
		KAV PRT #2 temperature inconsistency	1			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1		
		KAV PRT #3 temperature inconsistency	2			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1		
		KAV PRT #4 temperature inconsistency	3			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1		
		KAV PRT #5 temperature inconsistency	4			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1		
		KAV PRT #6 temperature inconsistency	5			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1		
		KAV PRT #7 temperature inconsistency	6			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1		
		KAV PRT #8 temperature inconsistency	7			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1		
QF18_SCAN_WGPRTTEMPCONSISTENCY	1byte(s)	Name: Scan; Granule Boundary: Yes; Dynamic: No; Min Array Size: 12; Max Array Size: 12											
		Datum											
		Description	Datum	Unscaled	Unscaled	Measurement	Scaled	Scale	Data	Fill Values	Legend Entries		

			Offset	Valid Range Min	Valid Range Max	Units		Factor Name	Type				
		WG PRT #1 temperature inconsistency	0			unitless	No		1 bit(s)	Name	Value	Name	Value
												False	0
												True	1
		WG PRT #2 temperature inconsistency	1			unitless	No		1 bit(s)	Name	Value	Name	Value
												False	0
												True	1
		WG PRT #3 temperature inconsistency	2			unitless	No		1 bit(s)	Name	Value	Name	Value
												False	0
												True	1
		WG PRT #4 temperature inconsistency	3			unitless	No		1 bit(s)	Name	Value	Name	Value
												False	0
												True	1
		WG PRT #5 temperature inconsistency	4			unitless	No		1 bit(s)	Name	Value	Name	Value
												False	0
												True	1
		WG PRT #6 temperature inconsistency	5			unitless	No		1 bit(s)	Name	Value	Name	Value
												False	0
												True	1
		WG PRT #7 temperature inconsistency	6			unitless	No		1 bit(s)	Name	Value	Name	Value
												False	0
												True	1
		Spare	7			unitless			1 bit(s)	Name	Value	Name	Value

QF19_SCAN_ATMSSDR — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	12	12

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Time Sequence Error - The nominal scan period of ATMS is 8/3 sec. The scan start time is defined as the start of sample 1. The scan start time of the current scan is compared to the scan start time of the previous scan. If the time difference is not within 8/3 sec +/- allowable_dev (initially 18 msec), the Time Sequence Error Flag is set. allowable_dev is a tunable parameter.	0			unitless	No		1 bit(s)	Name	Value	Name	Value
										False	0
										True	1

		Data Gap - Missing scan(s) preceding the current scan.	1			unitless	No		1 bit(s)	Name Value	Name	Value
											False	0
											True	1
		KAV PRT Sufficiency - Insufficient KAV PRT data are available, either because of missing data or failing to pass the quality checks.	2			unitless	No		1 bit(s)	Name Value	Name	Value
											False	0
											True	1
		WG PRT Sufficiency - Insufficient WG PRT data are available, either because of missing data or failing to pass the quality checks.	3			unitless	No		1 bit(s)	Name Value	Name	Value
											False	0
											True	1
		Space View antenna position error - There are 4 space view antenna groupings. ATMS is commanded to use one of the 4 groupings. The grouping selected is indicated by the Scan Pattern ID (Bit No. 7-9) in InstrumentMode. Values are interpreted as: 001, 010, 011, 100 = RAM profiles 1, 2, 3, 4. If any of the actual space view positions (as determined from the scan angle counts in the Science Data packet) does not fall within the range of the expected counts +/- εc, the Space View Antenna Position Error flag is set. The expected counts and εc are tunable parameters. εc is set to 7 counts.	4			unitless	No		1 bit(s)	Name Value	Name	Value
											False	0
											True	1
		Blackbody antenna position error - There are 4 blackbody view positions. If any of the actual blackbody view position (as determined from the scan angle counts in the Science Data packet) does not fall within the range of the expected count +/- εw, the Blackbody Antenna Position Error flag is set. The expected counts and εw are tunable parameters. εw is set to 7 counts.	5			unitless	No		1 bit(s)	Name Value	Name	Value
											False	0
											True	1
		Spare	6			unitless	No		2 bit(s)	Name Value	Name	Value
QF20_ATMSSDR	1byte(s)											

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	12	12
Channel	No	No	22	22

Datum											
Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Moon in Space View - The Moon appears in any of the four calibration space views.	0			unitless	No		1 bit(s)	Name Value		Name	Value
										False	0
										True	1

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		Gain Error - The lowest blackbody count is smaller than or equal to the highest space view count in a scan.	1			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1		
		Calibration With Fewer Than Preferred Samples -.Scan line has been calibrated with fewer than the preferred number of samples and/or scans either because of missing data or some data failing the quality checks.	2			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1		
		Space View Data Sufficiency Check - Insufficient space view samples are available, either because of missing data or failing to pass the quality checks.	3			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1		
		Blackbody View Data Sufficiency Check - Insufficient blackbody view samples are available, either because of missing data or failing to pass the quality checks.	4			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1		
		Spare	5			unitless	No		3 bit(s)	Name Value	Name Value		
QF21_ATMSSDR	1byte(s)	**Name** / **Granule Boundary** / **Dynamic** / **Min Array Size** / **Max Array Size** Scan / Yes / No / 12 / 12 Channel / No / No / 22 / 22											
		Datum Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**	**Legend Entries**		
		Space View #1 out of range condition	0			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1		
		Space View #2 out of range condition	1			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1		
		Space View #3 out of range condition	2			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1		
		Space View #4 out of range condition	3			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1		
		BlackBody View #1 out of range condition	4			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1		
		BlackBody View #2 out of range condition	5			unitless	No		1 bit(s)	Name Value	Name Value		

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												False	0
												True	1
		BlackBody View #3 out of range condition	6			unitless	No		1 bit(s)	Name Value		Name	Value
												False	0
												True	1
		BlackBody View #4 out of range condition	7			unitless	No		1 bit(s)	Name Value		Name	Value
												False	0
												True	1
QF22_ATMSSDR	1byte(s)												

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	12	12
Channel	No	No	22	22

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Space view #1 inconsistency	0			unitless	No		1 bit(s)	Name	Value	Name	Value
										False	0
										True	1
Space view #2 inconsistency	1			unitless	No		1 bit(s)	Name	Value	Name	Value
										False	0
										True	1
Space view #3 inconsistency	2			unitless	No		1 bit(s)	Name	Value	Name	Value
										False	0
										True	1
Space view #4 inconsistency	3			unitless	No		1 bit(s)	Name	Value	Name	Value
										False	0
										True	1
BlackBody view #1 inconsistency	4			unitless	No		1 bit(s)	Name	Value	Name	Value
										False	0
										True	1
BlackBody view #2 inconsistency	5			unitless	No		1 bit(s)	Name	Value	Name	Value
										False	0
										True	1
BlackBody view #3 inconsistency	6			unitless	No		1 bit(s)	Name	Value	Name	Value
										False	0
										True	1
BlackBody view #4 inconsistency	7			unitless	No		1 bit(s)	Name	Value	Name	Value
										False	0
										True	1

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PadByte1	1byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**							
		Granule	Yes	No	7	7							
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Pad byte	0			unitless	No		unsigned 8-bit char	**Name**	**Value**	**Name**	**Value**

Table 2.4.2-3, ATMS SDR Product Profile - Factors

Name	Data Size	Dimensions
BrightnessTemperatureFactors	4byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Factors	Yes	No	2	2

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Scale = first array element; offset = second array element	0			Scale = unitless; Offset = kelvin	No		32-bit floating point				

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2.4.3 ATMS SDR HDF5 Details

Figure 2.4.3-1 provides the details on the content and data types of the ATMS SDR. This UML diagram provides details at the product level only. In addition to this UML diagram, refer to Figure 2.2-1, Generalized UML Diagram for HDF5 SDR/TDR Files, for a complete UML rendering of this product.

ATMS-SDR
+BeamTime : H5T_NATIVE_LLONG +BrightnessTemperature : H5T_NATIVE_USHORT +NEdTCold : H5T_NATIVE_FLOAT +NEdTWarm : H5T_NATIVE_FLOAT +GainCalibration : H5T_NATIVE_FLOAT +InstrumentMode : H5T_NATIVE_USHORT +QF1_GRAN_HEALTHSTATUS : H5T_NATIVE_UCHAR +QF2_GRAN_HEALTHSTATUS : H5T_NATIVE_UCHAR +QF3_GRAN_HEALTHSTATUS : H5T_NATIVE_UCHAR +QF4_GRAN_HEALTHSTATUS : H5T_NATIVE_UCHAR +QF5_GRAN_HEALTHSTATUS : H5T_NATIVE_UCHAR +QF6_GRAN_HEALTHSTATUS : H5T_NATIVE_UCHAR +QF7_GRAN_HEALTHSTATUS : H5T_NATIVE_UCHAR +QF8_GRAN_HEALTHSTATUS : H5T_NATIVE_UCHAR +QF9_GRAN_HEALTHSTATUS : H5T_NATIVE_UCHAR +QF10_GRAN_HEALTHSTATUS : H5T_NATIVE_UCHAR +QF11_GRAN_QUADRATICCORRECTION : H5T_NATIVE_UCHAR +QF12_SCAN_KAVPRTCONVERR : H5T_NATIVE_UCHAR +QF13_SCAN_WGPRTCONVERR : H5T_NATIVE_UCHAR +QF14_SCAN_SHELFPRTCONVERR : H5T_NATIVE_UCHAR +QF15_SCAN_KAVPRTTEMPLIMIT : H5T_NATIVE_UCHAR +QF16_SCAN_WGPRTTEMPLIMIT : H5T_NATIVE_UCHAR +QF17_SCAN_KAVPRTTEMPCONSISTENCY : H5T_NATIVE_UCHAR +QF18_SCAN_WGPRTTEMPCONSISTENCY : H5T_NATIVE_UCHAR +QF19_SCAN_ATMSSDR : H5T_NATIVE_UCHAR +QF20_ATMSSDR : H5T_NATIVE_UCHAR +QF21_ATMSSDR : H5T_NATIVE_UCHAR +QF22_ATMSSDR : H5T_NATIVE_UCHAR +PadByte1 : H5T_NATIVE_UCHAR +BrightnessTemperatureFactors : H5T_NATIVE_FLOAT

Figure 2.4.3-1, ATMS SDR UML Diagram

2.4.4 ATMS SDR Metadata Details

The HDF5 metadata elements associated with the ATMS SDR are listed in the CDFCB-X Volume V, Section 4.3, HDF5 (Metadata) Hierarchy. The ATMS SDR metadata includes all common metadata at the root, product, aggregation, and granule level.

In addition to the common metadata items for the ATMS SDR, the items listed in Table 2.4.4-1, ATMS SDR Quality Summary Metadata are included as name/value pair items

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under the granule level metadata attribute “N_Quality_Summary”. The listed name/value pair items in the table are the granule level quality summary flags for the ATMS SDRs.

Table 2.4.4-1, ATMS SDR Quality Summary Metadata Values

N_Quality_Summary			
Name	**Value**	**Description**	**Comments**
Summary ATMS SDR Quality	0 – 100 %	Percentage of good quality earth view observations in granule	

2.4.5 ATMS SDR Geolocation Content Summary

Table 2.4.5-1, ATMS SDR Geolocation Data Content Summary

Name	Description	Data Type	Aggregate Dimension (N = Number of Granules)	Granule Dimension	Units
StartTime	Starting Time of scan in IET(1/1/1958)	64-bit integer	[N*12]	[12]	microsecond
MidTime	Mid Time of scan in IET (1/1/1958)	64-bit integer	[N*12]	[12]	microsecond
Latitude	Latitude of channel 17 beam position center (positive North)	32-bit floating point	[N*12, 96]	[12, 96]	degree
Longitude	Longitude of channel 17 beam position center (positive East)	32-bit floating point	[N*12, 96]	[12, 96]	degree
SolarZenithAngle	Zenith angle of sun at the geolocated beam position center	32-bit floating point	[N*12, 96]	[12, 96]	degree
SolarAzimuthAngle	Azimuth angle (measured clockwise positive from North) of sun at the geolocated beam position center	32-bit floating point	[N*12, 96]	[12, 96]	degree
SatelliteZenithAngle	Zenith angle to satellite at the geolocated beam position center	32-bit floating point	[N*12, 96]	[12, 96]	degree

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Name	Description	Data Type	Aggregate Dimension (N = Number of Granules)	Granule Dimension	Units
SatelliteAzimuthAngle	Azimuth angle (measured clockwise positive from North) to satellite at the geolocated beam position center	32-bit floating point	[N*12, 96]	[12, 96]	degree
Height	Ellipsoid-Geoid separation	32-bit floating point	[N*12, 96]	[12, 96]	meter
SatelliteRange	Line of sight distance from the ellipsoid intersection to the satellite	32-bit floating point	[N*12, 96]	[12, 96]	meter
BeamLatitude	Latitude of individual beam position centers (channels 1, 2, 3, 16, 17)	32-bit floating point	[N*12, 96, 5]	[12, 96, 5]	degree
BeamLongitude	Longitude of individual beam position centers (channels 1, 2, 3, 16, 17)	32-bit floating point	[N*12, 96, 5]	[12, 96, 5]	degree
SCPosition	Spacecraft position in Earth Centered Rotating (ECR) Coordinates (X, Y, Z) at the mid-time of scan	32-bit floating point	[N*12, 3]	[12, 3]	meter
SCVelocity	Spacecraft velocity in ECR Coordinates (dx/dt, dy/dt, dz/dt) at the mid-time of scan	32-bit floating point	[N*12, 3]	[12, 3]	m/s
SCAttitude	Spacecraft attitude with respect to Geodetic Reference Frame Coordinates (roll, pitch, yaw) at the mid-time of scan	32-bit floating point	[N*12, 3]	[12, 3]	arcsecond
QF1_ATMSSDRGEO	Attitude and Ephemeris availability status	unsigned 8-bit char	[N*12]	[12]	unitless
PadByte1	Pad byte	unsigned 8-bit char	[N*4]	[4]	unitless

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2.4.6 ATMS SDR Geolocation Product Profile

Table 2.4.6-1, ATMS SDR Geolocation Product Profile

Fields

Name	Data Size	Dimensions
StartTime	8byte(s)	
MidTime	8byte(s)	
Latitude	4byte(s)	
Longitude	4byte(s)	

StartTime — Dimensions

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	12	12

StartTime — Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Starting Time of scan in IET (1/1/1958)	0			microseconds	No		64-bit integer	NA_INT64_FILL	-999		
								MISS_INT64_FILL	-998		
								ERR_INT64_FILL	-995		
								VDNE_INT64_FILL	-993		

MidTime — Dimensions

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	12	12

MidTime — Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Mid Time of scan in IET (1/1/1958)	0			microseconds	No		64-bit integer	NA_INT64_FILL	-999		
								MISS_INT64_FILL	-998		
								ERR_INT64_FILL	-995		
								VDNE_INT64_FILL	-993		

Latitude — Dimensions

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	12	12
BeamPosition	No	No	96	96

Latitude — Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Latitude of channel 17 beam position center (positive North)	0	-90	90	degree	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

Longitude — Dimensions

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size

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		Scan	Yes	No	12	12
		BeamPosition	No	No	96	96

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Longitude of channel 17 beam position center (positive East)	0	-180	180	degree	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

SolarZenithAngle	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**
		Scan	Yes	No	12	12
		BeamPosition	No	No	96	96

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Zenith angle to sun at the geolocated beam position center	0	0	180	degree	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

SolarAzimuthAngle	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**
		Scan	Yes	No	12	12
		BeamPosition	No	No	96	96

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Azimuth angle (measured clockwise positive from North) of sun at the geolocated beam position center	0	-180	180	degree	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

SatelliteZenithAngle	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**
		Scan	Yes	No	12	12
		BeamPosition	No	No	96	96

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries

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		Zenith angle to satellite at the geolocated beam position center	0	0	~70	degree	No		32-bit floating point	**Name** / **Value**: NA_FLOAT32_FILL -999.9; MISS_FLOAT32_FILL -999.8; ERR_FLOAT32_FILL -999.5; VDNE_FLOAT32_FILL -999.3	**Name** / **Value**		

SatelliteAzimuthAngle — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	12	12
BeamPosition	No	No	96	96

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Azimuth angle (measured clockwise positive from North) at the geolocated beam position center	0	-180	180	degree	No		32-bit floating point	**Name** / **Value**: NA_FLOAT32_FILL -999.9; MISS_FLOAT32_FILL -999.8; ERR_FLOAT32_FILL -999.5; VDNE_FLOAT32_FILL -999.3	**Name** / **Value**

Height — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	12	12
BeamPosition	No	No	96	96

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Ellipsoid-Geoid separation	0			meter	No		32-bit floating point	**Name** / **Value**: NA_FLOAT32_FILL -999.9; MISS_FLOAT32_FILL -999.8; ERR_FLOAT32_FILL -999.5; VDNE_FLOAT32_FILL -999.3	**Name** / **Value**

SatelliteRange — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	12	12
BeamPosition	No	No	96	96

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Line of sight distance from the ellipsoid intersection to the satellite	0			meter	No		32-bit floating point	**Name** / **Value**: NA_FLOAT32_FILL -999.9; MISS_FLOAT32_FILL -999.8; ERR_FLOAT32_FILL -999.5; VDNE_FLOAT32_FILL -999.3	**Name** / **Value**

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BeamLatitude — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	12	12
BeamPosition	No	No	96	96
Channel	No	No	5	5

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Latitude of individual beam position centers (channels 1, 2, 3, 16, 17)	0	-90	90	degree	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

BeamLongitude — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	12	12
BeamPosition	No	No	96	96
Channel	No	No	5	5

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Longitude of individual beam position centers (channels 1, 2, 3, 16, 17)	0	-180	180	degree	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

SCPosition — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	12	12
ECRCoordinate	No	No	3	3

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Spacecraft position in Earth Centered Rotating (ECR) Coordinates (X, Y, Z) at the mid-time of scan	0			meter	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

SCVelocity — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	12	12
ECRCoordinate	No	No	3	3

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		Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Spacecraft velocity in ECR Coordinates (dx/dt, dy/dt, dz/dt) at the mid-time of scan	0			m/s	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

SCAttitude — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	12	12
GRFCoordinate	No	No	3	3

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Spacecraft attitude with respect to Geodetic Reference Frame Coordinates (roll, pitch, yaw) at the mid-time of scan	0			arcsecond	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

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Table 2.4.6-2, ATMS SDR Geolocation Product Profile -- Quality Flags

Name	Data Size	Dimensions
QF1_ATMSSDRGEO	1byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	12	12

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Attitude and Ephemeris availability status	0			unitless	No		2 bit(s)			Nominal - E&A data available	0
										Missing Data <= Small Gap	1
										Small Gap < Missing Data < Granule Boundary	2
										Missing Data >= Granule Boundary	3
Spare	2			unitless	No		6 bit(s)	Name	Value	Name	Value

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	4	4

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Pad byte	0			unitless	No		unsigned 8-bit char				

2.4.7 ATMS SDR Geolocation HDF5 Details

Figure 2.4.7-1 provides the details on the content and data types of the ATMS SDR. This UML diagram provides details at the product level only. In addition to this UML diagram, refer to Figure 2.2-1, Generalized UML Diagram for HDF5 SDR/TDR Files, for a complete UML rendering of this product.

ATMS-SDR-GEO
+StartTime : H5T_NATIVE_LLONG +MidTime : H5T_NATIVE_LLONG +Latitude : H5T_NATIVE_FLOAT +Longitude : H5T_NATIVE_FLOAT +SolarZenithAngle : H5T_NATIVE_FLOAT +SolarAzimuthAngle : H5T_NATIVE_FLOAT +SatelliteZenithAngle : H5T_NATIVE_FLOAT +SatelliteAzimuthAngle : H5T_NATIVE_FLOAT +Height : H5T_NATIVE_FLOAT +SatelliteRange : H5T_NATIVE_FLOAT +SCPosition : H5T_NATIVE_FLOAT +SCVelocity : H5T_NATIVE_FLOAT +SCAttitude : H5T_NATIVE_FLOAT +QF1_ATMSSDRGEO : H5T_NATIVE_UCHAR +PadByte1 : H5T_NATIVE_UCHAR

Figure 2.4.7-1, ATMS SDR Geolocation UML Diagram

2.4.8 ATMS SDR Geolocation Metadata Details

There are no quality summary metadata items in the ATMS SDR Geolocation.

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2.5 ATMS Remapped to CrIS SDR

Data Mnemonic	SDRE-ATMR-C0030
Description/ Purpose	Advanced Technology Microwave Sounder (ATMS) Sensor Data Records remapped onto the CrIS field of regard (Field of View (FOV) #5) locations. ATMS and Cross-track Infrared Sounder (CrIS) SDRs are used by the Cross-track Infrared Microwave Sounder Suite (CrIMSS) EDR processors to produce CrIMSS EDRs.
File-Naming Construct	See the CDFCB-X Volume I, D34862-01, Section 3.0 for details.
File Size	Approximately 5.6 KiB per data granule. Approximately 4.9 KiB per geolocation granule. Sizes do not include HDF5 overhead or metadata.
File Format Type	HDF5
Data Content and Data Format	See Section 2.5.1 ATMS Remapped to CrIS SDR Product Data Content Summary See Section 2.5.5 ATMS Remapped to CrIS SDR Geolocation Data Content Summary

2.5.1 ATMS Remapped to CrIS SDR Product Data Content Summary

Table 2.5.1-1, ATMS Remapped to CrIS SDR Product Data Content Summary

Name	Description	Data Type	Aggregate Dimension (N = Number of Granules)	Granule Dimension	Units
BrightnessTemperature	Calibrated scene brightness temperature for each ATMS channel and beam position remapped to each CrIS FOR. This output is the Rayleigh equivalent temperature.	unsigned 16-bit integer	[N*4, 30, 22]	[4,30, 22]	kelvin

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Name	Description	Data Type	Aggregate Dimension (N = Number of Granules)	Granule Dimension	Units
QF1_ATMSREMAPSDR	If a fill value is found for an ATMS sample used in resampling to an FOR, this flag is set to true for that FOR and ATMS channel (each bit corresponds to an ATMS channel 1 through 8)	unsigned 8-bit char	[N*4, 30]	[4,30]	unitless
QF2_ATMSREMAPSDR	If a fill value is found for an ATMS sample used in resampling to an FOR, this flag is set to true for that FOR and ATMS channel (each bit corresponds to an ATMS channel 9 through 16)	unsigned 8-bit char	[N*4, 30]	[4,30]	unitless
QF3_ATMSREMAPSDR	If a fill value is found for an ATMS sample used in resampling to an FOR, this flag is set to true for that FOR and ATMS channel (each bit corresponds to an ATMS channel 17 to 22 with 2 spare bits)	unsigned 8-bit char	[N*4, 30]	[4,30]	unitless
QF4_ATMSREMAPSDR	ATMS and CrIS time synchronization error detected	unsigned 8-bit char	[N*4]	[4]	unitless
BrightnessTemperatureFactors	Scale = first array element; offset = second array element	32-bit floating point	[N*2]	[2]	Scale = unitless; Offset= kelvin

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2.5.2 ATMS Remapped to CrIS SDR Product Profile

Table 2.5.2-1, ATMS Remapped to CrIS SDR Product Profile

Fields															
Name	**Data Size**	**Dimensions**													
BrightnessTemperature	2byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**									
		Scan	Yes	No	4	4									
		FOR	No	No	30	30									
		Channel	No	No	22	22									
		Datum													
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**			
		Calibrated scene brightness temperature for each ATMS channel and beam position remapped to the CrIS FORs. This output is the Rayleigh equivalent temperature.	0			kelvin	Yes	Brightness Temperature Factors	unsigned 16-bit integer	**Name**	**Value**	**Name**	**Value**		
										NA_UINT16_FILL	65535				
										MISS_UINT16_FILL	65534				
										ERR_UINT16_FILL	65531				
										VDNE_UINT16_FILL	65529				
										SOUB_UINT16_FILL	65528				

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Table 2.5.2-2, ATMS Remapped to CrIS SDR Product Profile - Quality Flags

Fields															
Name	**Data Size**	**Dimensions**													
QF1_ATMSREMAPSDR	1byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**									
		Scan	Yes	No	4	4									
		FOR	No	No	30	30									
		Datum													
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**			
		ATMS channel 1 missing samples in resampling	0			unitless	No		1 bit(s)	**Name**	**Value**	**Name**	**Value**		
												False	0		
												True	1		
		ATMS channel 2 missing samples in resampling	1			unitless	No		1 bit(s)	**Name**	**Value**	**Name**	**Value**		
												False	0		
												True	1		
		ATMS channel 3 missing samples in resampling	2			unitless	No		1 bit(s)	**Name**	**Value**	**Name**	**Value**		
												False	0		
												True	1		
		ATMS channel 4 missing samples in resampling	3			unitless	No		1 bit(s)	**Name**	**Value**	**Name**	**Value**		
												False	0		
												True	1		
		ATMS channel 5 missing samples in resampling	4			unitless	No		1 bit(s)	**Name**	**Value**	**Name**	**Value**		
												False	0		
												True	1		
		ATMS channel 6 missing samples in resampling	5			unitless	No		1 bit(s)	**Name**	**Value**	**Name**	**Value**		
												False	0		
												True	1		
		ATMS channel 7 missing samples in resampling	6			unitless	No		1 bit(s)	**Name**	**Value**	**Name**	**Value**		
												False	0		
												True	1		
		ATMS channel 8 missing samples in resampling	7			unitless	No		1 bit(s)	**Name**	**Value**	**Name**	**Value**		
												False	0		
												True	1		
QF2_ATMSREMAPSDR	1byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**									

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Scan	Yes	No	4	4
FOR	No	No	30	30

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
ATMS channel 9 missing samples in resampling	0			unitless	No		1 bit(s)			False	0
										True	1
ATMS channel 10 missing samples in resampling	1			unitless	No		1 bit(s)			False	0
										True	1
ATMS channel 11 missing samples in resampling	2			unitless	No		1 bit(s)			False	0
										True	1
ATMS channel 12 missing samples in resampling	3			unitless	No		1 bit(s)			False	0
										True	1
ATMS channel 13 missing samples in resampling	4			unitless	No		1 bit(s)			False	0
										True	1
ATMS channel 14 missing samples in resampling	5			unitless	No		1 bit(s)			False	0
										True	1
ATMS channel 15 missing samples in resampling	6			unitless	No		1 bit(s)			False	0
										True	1
ATMS channel 16 missing samples in resampling	7			unitless	No		1 bit(s)			False	0
										True	1

QF3_ATMSREMAPSDR 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	4	4
FOR	No	No	30	30

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries

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		ATMS channel 17 missing samples in resampling	0			unitless	No		1 bit(s)	**Name** **Value**	**Name** **Value**		
											False	0	
											True	1	
		ATMS channel 18 missing samples in resampling	1			unitless	No		1 bit(s)	**Name** **Value**	**Name** **Value**		
											False	0	
											True	1	
		ATMS channel 19 missing samples in resampling	2			unitless	No		1 bit(s)	**Name** **Value**	**Name** **Value**		
											False	0	
											True	1	
		ATMS channel 20 missing samples in resampling	3			unitless	No		1 bit(s)	**Name** **Value**	**Name** **Value**		
											False	0	
											True	1	
		ATMS channel 21 missing samples in resampling	4			unitless	No		1 bit(s)	**Name** **Value**	**Name** **Value**		
											False	0	
											True	1	
		ATMS channel 22 missing samples in resampling	5			unitless	No		1 bit(s)	**Name** **Value**	**Name** **Value**		
											False	0	
											True	1	
		Spare	6			unitless	No		2 bit(s)	**Name** **Value**	**Name** **Value**		
QF4_ATMSREMAPSDR	1byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**							
		Scan	Yes	No	4	4							
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**	**Legend Entries**		
		ATMS and CrIS time synchronization error detected	0			unitless	No		1 bit(s)	**Name** **Value**	**Name** **Value**		
											False	0	
											True	1	
		Spare	1			unitless	No		7 bit(s)	**Name** **Value**	**Name** **Value**		

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Table 2.5.2-3, ATMS Remapped to CrIS SDR Product Profile - Factors

Fields												
Name	**Data Size**	**Dimensions**										
BrightnessTemperatureFactors	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**						
		Factors	Yes	No	2	2						
		Datum										
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Scale = first array element; offset = second array element	0			Scale = unitless; Offset = kelvin	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**

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2.5.3 ATMS Remapped to CrIS SDR HDF5 Details

Figure 2.5.3-1 provides the details on the content and data types of the ATMS Remapped to CrIS SDR. This UML diagram provides details at the product level only. In addition to this UML diagram, refer to Figure 2.2-1, Generalized UML Diagram for HDF5 SDR/TDR Files, for a complete UML rendering of this product.

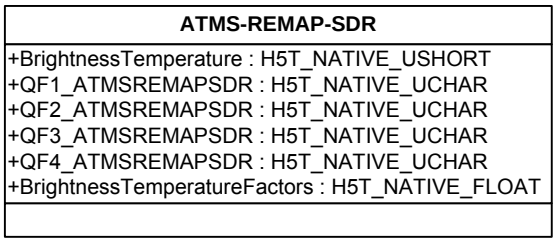

Figure 2.5.3-1, ATMS Remapped to CrIS SDR UML Diagram

2.5.4 ATMS Remapped to CrIS SDR Metadata Details

There are no quality summary metadata items in the ATMS Remapped to CrIS SDR.

2.5.5 ATMS Remapped to CrIS SDR Geolocation Content Summary

Table 2.5.5-1, ATMS Remapped to CrIS SDR Geolocation Data Content Summary

Name	Description	Data Type	Aggregate Dimension (N = Number of Granules)	Granule Dimension	Units
StartTime	Starting Time of CrIS Scan in IET	64-bit integer	[N*4]	[4]	microsecond
MidTime	Mid Time of CrIS Scan in IET	64-bit integer	[N*4]	[4]	microsecond
CrIS_FORTime	CrIS Field of Regard times (IET) used to create remapped product.	64-bit integer	[N*4, 30]	[4, 30]	microsecond
Latitude	Latitude (positive North)	32-bit floating point	[N*4, 30]	[4, 30]	degree
Longitude	Longitude (positive East)	32-bit floating point	[N*4, 30]	[4, 30]	degree
SolarZenithAngle	Solar Zenith Angle at the CrIS FOV #5 position.	32-bit floating point	[N*4, 30]	[4, 30]	degree

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Name	Description	Data Type	Aggregate Dimension (N = Number of Granules)	Granule Dimension	Units
SolarAzimuthAngle	Solar Azimuth Angle at the CrIS FOV #5 position.	32-bit floating point	[N*4, 30]	[4, 30]	degree
SatelliteZenithAngle	Satellite Zenith Angle at the CrIS FOV #5 position.	32-bit floating point	[N*4, 30]	[4, 30]	degree
SatelliteAzimuthAngle	Satellite Azimuth Angle at the CrIS FOV #5 position. Positive east of north.	32-bit floating point	[N*4, 30]	[4, 30]	degree
Height	Ellipsoid-Geoid separation	32-bit floating point	[N*4, 30]	[4, 30]	meter
SatelliteRange	Line of sight distance from the ellipsoid intersection to the satellite	32-bit floating point	[N*4, 30]	[4, 30]	meter
SCPosition	Spacecraft position in ECR Coordinates (X, Y, Z) at the midtime of scan.	32-bit floating point	[N*4, 3]	[4, 3]	meter
SCVelocity	Spacecraft velocity in ECR Coordinates (dx/dt, dy/dt, dz/dt) at the midtime of scan.	32-bit floating point	[N*4, 3]	[4, 3]	m/s
SCAttitude	Spacecraft attitude with respect to the Geodetic Reference Frame (roll, pitch, yaw) at the midtime of scan.	32-bit floating point	[N*4,3]	[4,3]	arcsecond
QF1_ATMSSDRGEO	Attitude and Ephemeris availability status	unsigned 8-bit char	[N*4]	[4]	unitless
PadByte1	Pad byte	unsigned 8-bit char	[N*4]	[4]	unitless

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2.5.6 ATMS Remapped to CrIS SDR Geolocation Product Profile

Table 2.5.6-1, ATMS Remapped to CrIS SDR Geolocation Product Profile

Fields		
Name	**Data Size**	**Dimensions**
StartTime	8byte(s)	
MidTime	8byte(s)	
CrIS_FORTime	8byte(s)	

StartTime — Dimensions

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	4	4

StartTime — Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Starting Time of CrIS Scan in IET	0			microsecond	No		64-bit integer	NA_INT64_FILL	-999		
								MISS_INT64_FILL	-998		
								ERR_INT64_FILL	-995		
								VDNE_INT64_FILL	-993		

MidTime — Dimensions

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	4	4

MidTime — Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Mid Time of CrIS Scan in IET	0			microsecond	No		64-bit integer	NA_INT64_FILL	-999		
								MISS_INT64_FILL	-998		
								ERR_INT64_FILL	-995		
								VDNE_INT64_FILL	-993		

CrIS_FORTime — Dimensions

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	4	4
FOR	No	No	30	30

CrIS_FORTime — Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
CrIS Field of Regards times	0			microsecond	No		64-bit integer				

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		(IET) used to create remapped product.								NA_INT64_FILL	-999	
										MISS_INT64_FILL	-998	
										ERR_INT64_FILL	-995	
										VDNE_INT64_FILL	-993	

Latitude — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	4	4
FOR	No	No	30	30

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Latitude (positive North)	0	-90	90	degree	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

Longitude — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	4	4
FOR	No	No	30	30

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Longitude (positive East)	0	-180	180	degree	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

SolarZenithAngle — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	4	4
FOR	No	No	30	30

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries

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		Solar Zenith Angle at the CrIS FOV #5 position.	0	0	180	degree	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
										NA_FLOAT32_FILL	-999.9		
										MISS_FLOAT32_FILL	-999.8		
										ERR_FLOAT32_FILL	-999.5		
										VDNE_FLOAT32_FILL	-999.3		
SolarAzimuthAngle	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**							
		Scan	Yes	No	4	4							
		FOR	No	No	30	30							
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Solar Azimuth Angle at the CrIS FOV #5 position.	0	-180	180	degree	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
										NA_FLOAT32_FILL	-999.9		
										MISS_FLOAT32_FILL	-999.8		
										ERR_FLOAT32_FILL	-999.5		
										VDNE_FLOAT32_FILL	-999.3		
SatelliteZenithAngle	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**							
		Scan	Yes	No	4	4							
		FOR	No	No	30	30							
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Satellite Zenith Angle at the CrIS FOV #5 position.	0	0	~70	degree	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
										NA_FLOAT32_FILL	-999.9		
										MISS_FLOAT32_FILL	-999.8		
										ERR_FLOAT32_FILL	-999.5		
										VDNE_FLOAT32_FILL	-999.3		
SatelliteAzimuthAngle	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**							
		Scan	Yes	No	4	4							
		FOR	No	No	30	30							
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range**	**Unscaled Valid Range**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	

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				Min	Max							
		Satellite Azimuth Angle at the CrIS FOV #5 position. Positive east of north.	0	-180	180	degree	No		32-bit floating point	Name: NA_FLOAT32_FILL, Value: -999.9 Name: MISS_FLOAT32_FILL, Value: -999.8 Name: ERR_FLOAT32_FILL, Value: -999.5 Name: VDNE_FLOAT32_FILL, Value: -999.3		

Height — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	4	4
FOR	No	No	30	30

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Ellipsoid-Geoid separation	0			meter	No		32-bit floating point	Name: NA_FLOAT32_FILL, Value: -999.9 Name: MISS_FLOAT32_FILL, Value: -999.8 Name: ERR_FLOAT32_FILL, Value: -999.5 Name: VDNE_FLOAT32_FILL, Value: -999.3	

SatelliteRange — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	4	4
FOR	No	No	30	30

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Line of sight distance from the ellipsoid intersection to the satellite	0			meter	No		32-bit floating point	Name: NA_FLOAT32_FILL, Value: -999.9 Name: MISS_FLOAT32_FILL, Value: -999.8 Name: ERR_FLOAT32_FILL, Value: -999.5 Name: VDNE_FLOAT32_FILL, Value: -999.3	

SCPosition — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	4	4
ECRCoordinate	No	No	3	3

Datum

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		Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
		Spacecraft position in ECR Coordinates (X, Y, Z) at the midtime of scan.	0			meter	No		32-bit floating point	Name	Value	Name	Value
										NA_FLOAT32_FILL	-999.9		
										MISS_FLOAT32_FILL	-999.8		
										ERR_FLOAT32_FILL	-999.5		
										VDNE_FLOAT32_FILL	-999.3		

		Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
SCVelocity	4byte(s)	Scan	Yes	No	4	4
		ECRCoordinate	No	No	3	3

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Spacecraft velocity in ECR Coordinates (dx/dt, dy/dt, dz/dt) at the midtime of scan.	0			m/s	No		32-bit floating point	Name	Value	Name	Value
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

		Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
SCAttitude	4byte(s)	Scan	Yes	No	4	4
		GRFCoordinate	No	No	3	3

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Spacecraft attitude with respect to Geodetic Reference Frame (roll, pitch, yaw) at the midtime of	0			arcsecond	No		32-bit floating point	Name	Value	Name	Value
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

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		scan.									

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Table 2.5.6-2, ATMS Remapped to CrIS SDR Geolocation Product Profile - Quality Flags

Name	Data Size	Dimensions
QF1_ATMSSDRGEO	1byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	4	4

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Attitude and Ephemeris availability status	0			unitless	No		2 bit(s)			Nominal - E&A data available	0
										Missing Data <= Small Gap	1
										Small Gap < Missing Data < Granule Boundary	2
										Missing Data >= Granule Boundary	3
Spare	2			unitless	No		6 bit(s)	Name	Value	Name	Value

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	4	4

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Pad byte	0			unitless	No		unsigned 8-bit char				

2.5.7 ATMS Remapped to CrIS SDR Geolocation HDF5 Details

Figure 2.5.7-1 provides the details on the content and data types of the ATMS Remapped to CrIS SDR Geolocation. This UML diagram provides details at the product level only. In addition to this UML diagram, refer to Figure 2.2-1, Generalized UML Diagram for HDF5 SDR/TDR Files, for a complete UML rendering of this product.

ATMS-REMAP-SDR-GEO
+StartTime : H5T_NATIVE_LLONG +MidTime : H5T_NATIVE_LLONG +CrIS_FORTime : H5T_NATIVE_LLONG +Latitude : H5T_NATIVE_FLOAT +Longitude : H5T_NATIVE_FLOAT +SolarZenithAngle : H5T_NATIVE_FLOAT +SolarAzimuthAngle : H5T_NATIVE_FLOAT +SatelliteZenithAngle : H5T_NATIVE_FLOAT +SatelliteAzimuthAngle : H5T_NATIVE_FLOAT +Height : H5T_NATIVE_FLOAT +SatelliteRange : H5T_NATIVE_FLOAT +SCPosition : H5T_NATIVE_FLOAT +SCVelocity : H5T_NATIVE_FLOAT +SCAttitude : H5T_NATIVE_FLOAT +QF1_ATMSSDRGEO : H5T_NATIVE_UCHAR +PadByte1 : H5T_NATIVE_UCHAR

Figure 2.5.7-1, ATMS Remapped to CrIS SDR Geolocation UML Diagram

2.5.8 ATMS Remapped to CrIS SDR Geolocation Metadata Details

There are no quality summary metadata items in the ATMS Remapped to CrIS SDR Geolocation.

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2.6 Cross-Track Infrared Sounder SDR

Data Mnemonic	SDRE-CrIS-C0030
Description/ Purpose	CrIS is an infrared sounder (Michelson Interferometer) designed to measure scene radiance and calculate the vertical distribution of temperature, moisture, and pressure in the Earth's atmosphere. CrIS is designed to work in unison with the Advanced Technology Microwave Sounder (ATMS); together they create the Cross-track Infrared Microwave Sounding Suite (CrIMSS). The CrIS SDR algorithms transform the scene interferograms into fully calibrated, unapodized, spectral information. For the radiance arrays dimensioned with wavenumber, the wavenumber is increasing, and the values are most representative of the wavelength bin center. For arrays dimensioned with “band” […3], the ordering is LW (Long-wave), MW (Middle-wave), SW (Short-wave). Raw data (earth view, internal calibration and space view) are preprocessed, undergo radiometric, spectral, and geometric calibrations, and are quality checked prior to SDR creation. This output is then used in subsequent atmospheric parameter calculations. As depicted in Figure 2.6-1, CrIS Field-of-Regard (FOR), the FOR is a 3 x 3 element detector field-of-view (FOV) array. Each FOV subtends slightly less than 1 degree with a 1.1 degree separation between FOVs. The first element of data arrays with dimensions associated with FOV is from detector #1, and so on sequentially through 9. Although the Earth Scene (prefixed with ES_) data presented in the SDR is a contiguous array of FOVs and FORs, the SDR data should always be used with its respective geolocation in order to georeference the data.
File-Naming Construct	See the CDFCB-X Volume I, D34862-01, Section 3.0 for details.
File Size	Approximately 16703 KiB per data granule. Approximately 35 KiB per geolocation granule. Sizes do not include HDF5 overhead or metadata.
File Format Type	HDF5
Data Content and Data Format	See Section 2.6.1 CrIS SDR Product Data Content Summary See Section 2.6.5, CrIS SDR Geolocation Content Summary

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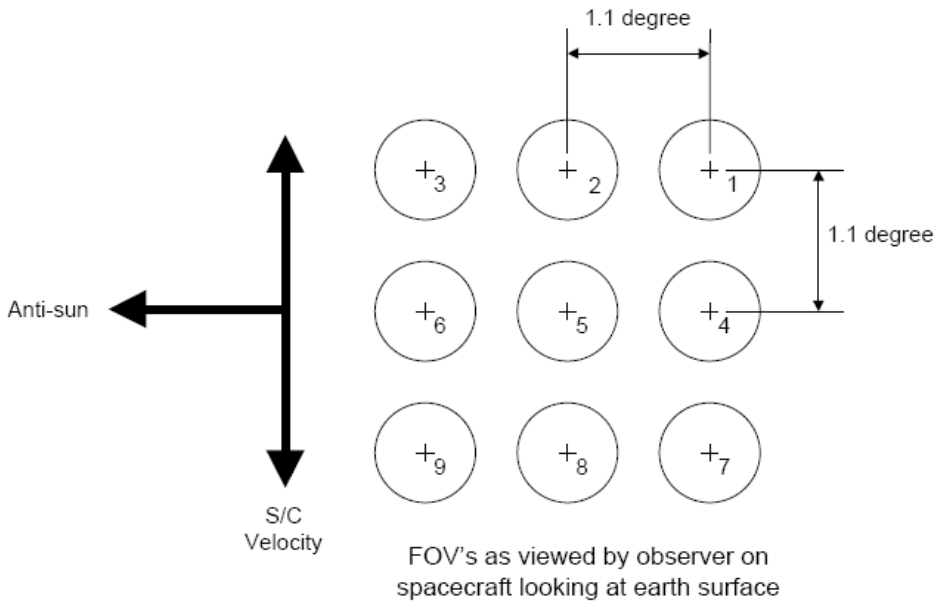

Figure 2.6.1-1, CrIS Field of Regard

2.6.1 CrIS SDR Product Data Content Summary

Table 2.6.1-1, CrIS SDR Product Data Content Summary

Name	Description	Data Type	Aggregate Dimension (N = Number of Granules)	Granule Dimension	Units
ES_RealLW	CrIS LW Band spectrally and radiometrically calibrated radiances (real part of spectra)	32-bit floating point	[N*4, 30, 9, 717]	[4, 30, 9, 717]	mW/(m^2 sr cm^{-1})
ES_RealMW	CrIS MW Band spectrally and radiometrically calibrated data for mid-wave band (real part of spectra)	32-bit floating point	[N*4, 30, 9, 437]	[4, 30, 9, 437]	mW/(m^2 sr cm^{-1})

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Name	Description	Data Type	Aggregate Dimension (N = Number of Granules)	Granule Dimension	Units
ES_RealSW	CrIS SW Band spectrally and radiometrically calibrated data for short-wave band (real part of spectra)	32-bit floating point	[N*4, 30, 9, 163]	[4, 30, 9, 163]	mW/(m^2 sr cm^{-1})
ES_ImaginaryLW	Imaginary part of spectra for long-wave band	32-bit floating point	[N*4, 30, 9, 717]	[4, 30, 9, 717]	mW/(m^2 sr cm^{-1})
ES_ImaginaryMW	Imaginary part of spectra for mid-wave band	32-bit floating point	[N*4, 30, 9, 437]	[4, 30, 9, 437]	mW/(m^2 sr cm^{-1})
ES_ImaginarySW	Imaginary part of spectra for short-wave band	32-bit floating point	[N*4, 30, 9, 163]	[4, 30, 9, 163]	mW/(m^2 sr cm^{-1})
ES_NEdNLW	Spectral Noise Estimate - long-wave	32-bit floating point	[N*4, 30, 9, 717]	[4, 30, 9, 717]	mW/(m^2 sr cm^{-1})
ES_NEdNMW	Spectral Noise Estimate - mid-wave	32-bit floating point	[N*4, 30, 9, 437]	[4, 30, 9, 437]	mW/(m^2 sr cm^{-1})
ES_NEdNSW	Spectral Noise Estimate - short-wave	32-bit floating point	[N*4, 30, 9, 163]	[4, 30, 9, 163]	mW/(m^2 sr cm^{-1})
DS_WindowSize	The number of Deep Space (DS) spectra used to calibrate the earth scene.	unsigned 16-bit integer	[N*4, 2, 9, 3]	[4, 2, 9, 3]	unitless
ICT_WindowSize	The number of Internal Calibration Target (ICT) spectra used to calibrate the earth scene.	unsigned 16-bit integer	[N*4, 2, 9, 3]	[4, 2, 9, 3]	unitless
ES_ZPDMagnitude	Interferogram magnitude at zero path difference	unsigned 16-bit integer	[N*4, 30, 9, 3]	[4, 30, 9, 3]	unitless
ES_ZPDFringeCount	Interferogram fringe count at zero path difference before decimation	unsigned 16-bit integer	[N*4, 30, 9, 3]	[4, 30, 9, 3]	unitless

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Name	Description	Data Type	Aggregate Dimension (N = Number of Granules)	Granule Dimension	Units
SDRFringeCount	The calculated number of fringes that the interferogram was advanced or delayed.	unsigned 16-bit integer	[N*4, 30, 9, 3]	[4, 30, 9, 3]	unitless
ES_RDRImpulseNoise	This flag represents the number of samples in an interferogram that exceeded the impulse noise mask and were set to zero; if > 1 the resultant spectrum is flagged as having excess noise.	unsigned 8-bit char	[N*4, 30, 9, 3]	[4, 30, 9, 3]	unitless
MonitoredLaserWavelength	This flag represents the monitored laser metrology wavelength, calculated using data from the 4-min engineering packets and Neon calibrated laser metrology wavelength.	64-bit floating point	[N*4]	[4]	nm
MeasuredLaserWavelength	This quality flag represents the measured metrology laser wavelength with neon lamp calibration.	64-bit floating point	[N*4]	[4]	nm
ResamplingLaserWavelength	This flag represents the wavelength used for the spectral resampling, which is half of the current metrology laser wavelength.	64-bit floating point	[N*4]	[4]	nm
DS_Symmetry	This flag is intended to identify the asymmetry in the measured DS IGMs.	64-bit floating point	[N*4, 9, 3]	[4, 9, 3]	unitless

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Name	Description	Data Type	Aggregate Dimension (N = Number of Granules)	Granule Dimension	Units
DS_SpectralStability	This flag monitors the spectral variability of the DS views within the moving window.	64-bit floating point	[N*4, 2, 9, 3]	[4, 2, 9, 3]	unitless
ICT_SpectralStability	This flag monitors the spectral variability of the ICT views within the moving window.	64-bit floating point	[N*4, 2, 9, 3]	[4, 2, 9, 3]	unitless
ICT_TemperatureStability	This flag measures the stability of the two Platinum Resistance Temperature measurements of the Internal Calibration Target.	32-bit floating point	[N*4, 2]	[4, 2]	K
ICT_TemperatureConsistency	This flag measures the consistency between the two Platinum Resistance Temperature measurements of the Internal Calibration Target.	32-bit floating point	[N*4]	[4]	K
NumberOfValidPRTTemps	Number of valid PRT Temperatures used	unsigned 8-bit char	[N*4, 2]	[4, 2]	unitless
QF1_SCAN_CRISSDR	Scan-level Quality Flags	unsigned 8-bit char	[N*4]	[4]	unitless
QF2_CRISSDR	Calibration Quality Flags	unsigned 8-bit char	[N*4, 9, 3]	[4, 9, 3]	unitless
QF3_CRISSDR	FOV Quality Flags	unsigned 8-bit char	[N*4, 30, 9, 3]	[4, 30, 9, 3]	unitless
QF4_CRISSDR	FOV Quality Flags	unsigned 8-bit char	[N*4, 30, 9, 3]	[4, 30, 9, 3]	unitless

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2.6.2 CrIS SDR Product Profile

Table 2.6.2-1, CrIS SDR Product Profile

Name	Data Size	Dimensions
ES_RealLW	4byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	4	4
FOR	No	No	30	30
FOV	No	No	9	9
LWPoint	No	No	717	717

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
CrIS LW Band spectrally and radiometrically calibrated radiances (real part of spectra)	0			mW/(m^2 sr cm^{-1})	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

Name	Data Size	Dimensions
ES_RealMW	4byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	4	4
FOR	No	No	30	30
FOV	No	No	9	9
MWPoint	No	No	437	437

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
CrIS MW Band spectrally and radiometrically calibrated	0			mW/(m^2 sr cm^{-1})	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

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		data for mid-wave band (real part of spectra)									

ES_RealSW — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	4	4
FOR	No	No	30	30
FOV	No	No	9	9
SWPoint	No	No	163	163

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
CrIS SW Band spectrally and radiometrically calibrated data for short-wave band (real part of spectra)	0			mW/(m^2 sr cm^{-1})	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

ES_ImaginaryLW — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	4	4
FOR	No	No	30	30
FOV	No	No	9	9
LWPoint	No	No	717	717

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Imaginary part of spectra for long-wave band	0			mW/(m^2 sr cm^{-1})	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

ES_ImaginaryMW — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	4	4

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FOR	No	No	30	30
FOV	No	No	9	9
MWPoint	No	No	437	437

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	**Value**	**Name**	**Value**
Imaginary part of spectra for mid-wave band	0			mW/(m^2 sr cm^{-1})	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

ES_ImaginarySW — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	4	4
FOR	No	No	30	30
FOV	No	No	9	9
SWPoint	No	No	163	163

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	**Value**	**Name**	**Value**
Imaginary part of spectra for short-wave band	0			mW/(m^2 sr cm^{-1})	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

ES_NEdNLW — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	4	4
FOR	No	No	30	30
FOV	No	No	9	9
LWPoint	No	No	717	717

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries

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		Spectral Noise Estimate - long-wave	0			mW/(m^2 sr cm^{-1})	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
										NA_FLOAT32_FILL	-999.9		
										MISS_FLOAT32_FILL	-999.8		
										ERR_FLOAT32_FILL	-999.5		
										VDNE_FLOAT32_FILL	-999.3		
ES_NEdNMW	4byte(s)												

Name	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**
Scan	Yes	No	4	4
FOR	No	No	30	30
FOV	No	No	9	9
MWPoint	No	No	437	437

Datum

Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
Spectral Noise Estimate - mid-wave	0			mW/(m^2 sr cm^{-1})	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

ES_NEdNSW	4byte(s)												

Name	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**
Scan	Yes	No	4	4
FOR	No	No	30	30
FOV	No	No	9	9
SWPoint	No	No	163	163

Datum

Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
Spectral Noise Estimate - short-wave	0			mW/(m^2 sr cm^{-1})	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

DS_WindowSize	2byte(s)												

Name	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**
Scan	Yes	No	4	4
DS_View	No	No	2	2

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		FOV: No / No / 9 / 9 Band: No / No / 3 / 3 **Datum** **Description:** The number of Deep Space (DS) spectra used to calibrate the earth scene. **Datum Offset:** 0 **Unscaled Valid Range Min:** **Unscaled Valid Range Max:** **Measurement Units:** unitless **Scaled:** No **Scale Factor Name:** **Data Type:** unsigned 16-bit integer **Fill Values:** NA_UINT16_FILL 65535; MISS_UINT16_FILL 65534; ERR_UINT16_FILL 65531; VDNE_UINT16_FILL 65529 **Legend Entries:**
ICT_WindowSize	2byte(s)	**Name** / **Granule Boundary** / **Dynamic** / **Min Array Size** / **Max Array Size** Scan / Yes / No / 4 / 4 ICT_View / No / No / 2 / 2 FOV / No / No / 9 / 9 Band / No / No / 3 / 3 **Datum** **Description:** The number of Internal Calibration Target (ICT) spectra used to calibrate the earth scene. **Datum Offset:** 0 **Unscaled Valid Range Min:** **Unscaled Valid Range Max:** **Measurement Units:** unitless **Scaled:** No **Scale Factor Name:** **Data Type:** unsigned 16-bit integer **Fill Values:** NA_UINT16_FILL 65535; MISS_UINT16_FILL 65534; ERR_UINT16_FILL 65531; VDNE_UINT16_FILL 65529 **Legend Entries:**
ES_ZPDMagnitude	2byte(s)	**Name** / **Granule Boundary** / **Dynamic** / **Min Array Size** / **Max Array Size** Scan / Yes / No / 4 / 4 FOR / No / No / 30 / 30 FOV / No / No / 9 / 9 Band / No / No / 3 / 3 **Datum** **Description:** **Datum:** **Unscaled Valid:** **Unscaled Valid:** **Measurement Units:** **Scaled:** **Scale Facto:** **Data Type:** **Fill Values:** **Legend Entries:**

			Offset	Range Min	Range Max			r Name					
		Interferogram magnitude at zero path difference.	0			unitless	No		unsigned 16-bit integer	Name	Value	Name	Value
										NA_UINT16_FILL	65535		
										MISS_UINT16_FILL	65534		
										ERR_UINT16_FILL	65531		
										VDNE_UINT16_FILL	65529		

ES_ZPDFringeCount — 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	4	4
FOR	No	No	30	30
FOV	No	No	9	9
Band	No	No	3	3

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Interferogram fringe count at zero path difference before decimation.	0			unitless	No		unsigned 16-bit integer	Name	Value	Name	Value
								NA_UINT16_FILL	65535		
								MISS_UINT16_FILL	65534		
								ERR_UINT16_FILL	65531		
								VDNE_UINT16_FILL	65529		

SDRFringeCount — 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	4	4
FOR	No	No	30	30
FOV	No	No	9	9
Band	No	No	3	3

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
The calculated number of fringes that the interferogram	0			unitless	No		unsigned 16-bit integer	Name	Value	Name	Value
								NA_UINT16_FILL	65535		
								MISS_UINT16_FILL	65534		
								ERR_UINT16_FILL	65531		
								VDNE_UINT16_FILL	65529		

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		was advanced or delayed.
ES_RDRImpulseNoise	1byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	4	4
FOR	No	No	30	30
FOV	No	No	9	9
Band	No	No	3	3

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
This flag represents the number of samples in an interferogram that exceeded the impulse noise mask and were set to zero; if > 1 the resultant spectrum is flagged as having excess noise.	0			unitless	No		unsigned 8-bit char	NA_UINT8_FILL	255		
								MISS_UINT8_FILL	254		
								ERR_UINT8_FILL	251		
								VDNE_UINT8_FILL	249		

MonitoredLaserWavelength 8byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	4	4

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
This flag represents the monitored laser metrology	0			nm	No		64-bit floating point	NA_FLOAT64_FILL	-999.9		
								MISS_FLOAT64_FILL	-999.8		
								ERR_FLOAT64_FILL	-999.5		
								VDNE_FLOAT64_FILL	-999.3		

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		wavelength, calculated using data from the 4-min engineering packets and Neon calibrated laser metrology wavelength.										

MeasuredLaserWavelength — 8byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	4	4

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
This quality flag represents the measured metrology laser wavelength with neon lamp calibration.	0			nm	No		64-bit floating point	NA_FLOAT64_FILL	-999.9		
								MISS_FLOAT64_FILL	-999.8		
								ERR_FLOAT64_FILL	-999.5		
								VDNE_FLOAT64_FILL	-999.3		

ResamplingLaserWavelength — 8byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	4	4

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
This flag represents the wavelength used for the	0			nm	No		64-bit floating point	NA_FLOAT64_FILL	-999.9		
								MISS_FLOAT64_FILL	-999.8		
								ERR_FLOAT64_FILL	-999.5		

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		spectral resampling, which is half of the current metrology laser wavelength.								VDNE_FLOAT64_FILL	-999.3	

DS_Symmetry — 8byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	4	4
FOV	No	No	9	9
Band	No	No	3	3

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
This flag is intended to identify the asymmetry in the measured DS IGMs.	0			unitless	No		64-bit floating point	NA_FLOAT64_FILL	-999.9		
								MISS_FLOAT64_FILL	-999.8		
								ERR_FLOAT64_FILL	-999.5		
								VDNE_FLOAT64_FILL	-999.3		

DS_SpectralStability — 8byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	4	4
Direction	No	No	2	2
FOV	No	No	9	9
Band	No	No	3	3

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
This flag monitors the spectral variability of the DS views within the moving	0			unitless	No		64-bit floating point	NA_FLOAT64_FILL	-999.9		
								MISS_FLOAT64_FILL	-999.8		
								ERR_FLOAT64_FILL	-999.5		
								VDNE_FLOAT64_FILL	-999.3		

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		window.
ICT_SpectralStability	8byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	4	4
Direction	No	No	2	2
FOV	No	No	9	9
Band	No	No	3	3

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
This flag monitors the spectral variability of the ICT views within the moving window.	0			unitless	No		64-bit floating point	NA_FLOAT64_FILL	-999.9		
								MISS_FLOAT64_FILL	-999.8		
								ERR_FLOAT64_FILL	-999.5		
								VDNE_FLOAT64_FILL	-999.3		

ICT_TemperatureStability | 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	4	4
Direction	No	No	2	2

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
This flag measures the stability of the two Platinum Resistance Temperature measurements of the Internal Calibration Target.	0			kelvin	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

ICT_TemperatureConsistency | 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	4	4

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		Datum										
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		This flag measures the consistency between the two Platinum Resistance Temperature measurements of the Internal Calibration Target.	0			kelvin	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
										NA_FLOAT32_FILL	-999.9		
										MISS_FLOAT32_FILL	-999.8		
										ERR_FLOAT32_FILL	-999.5		
										VDNE_FLOAT32_FILL	-999.3		
NumberOfValidPRTTemps	1byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**							
		Scan	Yes	No	4	4							
		PRTType	No	No	2	2							
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Number of valid PRT Temperatures used.	0			unitless	No		unsigned 8-bit char	**Name**	**Value**	**Name**	**Value**
										NA_UINT8_FILL	255		
										MISS_UINT8_FILL	254		
										ERR_UINT8_FILL	251		
										VDNE_UINT8_FILL	249		

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Table 2.6.2-2, CrIS SDR Product Profile - Quality Flags

Name	Data Size	Dimensions
QF1_SCAN_CRISSDR	1byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	4	4

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Data Gap - There is a data gap in the RDRs, i.e. missing scan(s), preceding the current scan.	0			unitless	No		1 bit(s)	Name: Value:	Name: False, Value: 0; Name: True, Value: 1
Timing sequence Error - The recorded time is not in sequence. Set if scan start time is out of sequence.	1			unitless	No		1 bit(s)	Name: Value:	Name: False, Value: 0; Name: True, Value: 1
Lambda Monitored Quality -Invalid laser wavelength calculation due to invalid diode current and/or temperature measurements. This flag is set by checking if the laser diode current and temperature measurements are out of the predetermined allowable ranges. The ranges are tunable. (0 – Lambda Monitored calculation is valid and updated; 1 – Lambda Monitored is not updated due to invalid laser diode bias current or invalid laser diode temperature).	2			unitless	No		1 bit(s)	Name: Value:	Name: False, Value: 0; Name: True, Value: 1
Invalid Instrument Temperatures - The measured temperature of any instrument components (e.g., beam-splitter, scan mirror, scan baffle, etc.) are out of allowable ranges. These temperatures are used to compute the “environmental” contribution to the ICT radiances. If this happens, the invalid temperatures are replaced	3			unitless	No		1 bit(s)	Name: Value:	Name: False, Value: 0; Name: True, Value: 1

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		with the validated temperature value of the ICT.											
		Excess Thermal Drift (over threshold): At least one of the monitored instrument temperatures has drifted more than a specified tolerance value.	4			unitless	No		1 bit(s)	**Name** **Value**	**Name** **Value** False 0 True 1		
		Suspect neon calibration flag is set	5			unitless	No		1 bit(s)	**Name** **Value**	**Name** **Value** False 0 True 1		
		Spare	6			unitless	No		2 bit(s)	**Name** **Value**	**Name** **Value**		
QF2_CRISSDR	1byte(s)	**Name** **Granule Boundary** **Dynamic** **Min Array Size** **Max Array Size** Scan Yes No 4 4 FOV No No 9 9 Band No No 3 3											
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**	**Legend Entries**		
		Lunar Intrusion - If set at least one spectrum in the Deep Space moving average was invalidated due to a lunar intrusion.	0			unitless	No		2 bit(s)	**Name** **Value**	**Name** **Value** No intrusion 0 Lunar intrusion on first DS view 1 Lunar intrusion on second DS view 2 Intrusion on both DS views. 3		
		Spare	2			unitless	No		6 bit(s)	**Name** **Value**	**Name** **Value**		
QF3_CRISSDR	1byte(s)	**Name** **Granule Boundary** **Dynamic** **Min Array Size** **Max Array Size** Scan Yes No 4 4 FOR No No 30 30 FOV No No 9 9 Band No No 3 3											

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		Datum									
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**	**Legend Entries**
		SDR Quality - 2 (invalid): if Bit Trim Failed = 1; OR FCE Detect = 1; OR Invalid RDR = 1; OR Invalid Radiometric Calibration = 2; OR Invalid Spectral Calibration = 2.	0			unitless	No		2 bit(s)	**Name** **Value**	**Name** **Value** Good 0 Degraded 1 Invalid 2
		Invalid Geolocation - The geolocation information included in the SDR is invalid.	2			unitless	No		1 bit(s)	**Name** **Value**	**Name** **Value** False 0 True 1
		Invalid Radiometric Calibration - 2(invalid): if radiometric calibration is not performed or performed with invalid calibration data (e.g., DS Window size = 0).	3			unitless	No		2 bit(s)	**Name** **Value**	**Name** **Value** Good 0 Degraded 1 Invalid 2
		Invalid Spectral Calibration - 2 (invalid): if FCE corrected = 1; or if Suspect Neon Calibration =1 AND Lambda Monitored Quality = 1.	5			unitless	No		2 bit(s)	**Name** **Value**	**Name** **Value** Good 0 Degraded 1 Invalid 2
		Fringe Count Error Correction Failed.	7			unitless	No		1 bit(s)	**Name** **Value**	**Name** **Value** False 0 True 1
QF4_CRISSDR	1byte(s)	**Name** **Granule Boundary** **Dynamic** **Min Array Size** **Max Array Size** Scan Yes No 4 4 FOR No No 30 30 FOV No No 9 9 Band No No 3 3									
		Datum									
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**	**Legend Entries**

		Day/Night Indicator	0			unitless	No		1 bit(s)	**Name**	**Value**	**Name**	**Value**
												Day (Solar Zenith Angle < 90)	0
												Night (Solar Zenith Angle >= 90)	1
		Invalid RDR Data - The instrument exhibited operational errors and the associated interferogram(s) is excluded from SDR processing.	1			unitless	No		1 bit(s)	**Name**	**Value**	**Name**	**Value**
												False	0
												True	1
		Fringe Count Error Detection - A significant number of fringes have been missed, shifting the interferogram ZPD outside of a window monitored by the instrument, and the interferogram is excluded from SDR processing.	2			unitless	No		1 bit(s)	**Name**	**Value**	**Name**	**Value**
												False	0
												True	1
		Bit Trim Failed	3			unitless	No		1 bit(s)	**Name**	**Value**	**Name**	**Value**
												False	0
												True	1
		Spare	4			unitless	No		4 bit(s)	**Name**	**Value**	**Name**	**Value**

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2.6.3 CrIS SDR HDF5 Details

Figure 2.6.3-1 provides the details on the content and data types of the CrIS SDR. This UML diagram provides details at the product level only. In addition to this UML diagram, refer to Figure 2.2-1, Generalized UML Diagram for HDF5 SDR/TDR Files, for a complete UML rendering of this product.

CrIS-SDR
+ES_RealLW : H5T_NATIVE_FLOAT +ES_RealMW : H5T_NATIVE_FLOAT +ES_RealSW : H5T_NATIVE_FLOAT +ES_ImaginaryLW : H5T_NATIVE_FLOAT +ES_ImaginaryMW : H5T_NATIVE_FLOAT +ES_ImaginarySW : H5T_NATIVE_FLOAT +ES_NEdNLW : H5T_NATIVE_FLOAT +ES_NEdNMW : H5T_NATIVE_FLOAT +ES_NEdNSW : H5T_NATIVE_FLOAT +DS_WindowSize : H5T_NATIVE_USHORT +ICT_WindowSize : H5T_NATIVE_USHORT +ES_ZPDMagnitude : H5T_NATIVE_USHORT +ES_ZPDFringeCount : H5T_NATIVE_USHORT +ES_FCECount : H5T_NATIVE_USHORT +SDRFringeCount : H5T_NATIVE_USHORT +ES_RDRImpulseNoise : H5T_NATIVE_UCHAR +MonitoredLaserWavelength : H5T_NATIVE_DOUBLE +MeasuredLaserWavelength : H5T_NATIVE_DOUBLE +ResamplingLaserWavelength : H5T_NATIVE_DOUBLE +DS_Symmetry : H5T_NATIVE_DOUBLE +DS_SpectralStability : H5T_NATIVE_DOUBLE +ICT_SpectralStability : H5T_NATIVE_DOUBLE +ICT_TemperatureStability : H5T_NATIVE_FLOAT +ICT_TemperatureConsistency : H5T_NATIVE_FLOAT +NumberOfValidPRTTemps : H5T_NATIVE_UCHAR +QF1_SCAN_CRISSDR : H5T_NATIVE_UCHAR +QF2_CRISSDR : H5T_NATIVE_UCHAR +QF3_CRISSDR : H5T_NATIVE_UCHAR +QF4_CRISSDR : H5T_NATIVE_UCHAR

Figure 2.6.3-1, CrIS SDR UML Diagram

2.6.4 CrIS SDR Metadata Details

The HDF5 metadata elements associated with the CrIS SDR are listed in the CDFCB-X Volume V, Section 4.3, HDF5 (Metadata) Hierarchy. The CrIS SDR metadata includes all common metadata at the root, product, aggregation, and granule level.

In addition to the common metadata items for the CrIS SDR, the items listed in Table 2.6.4-1, CrIS SDR Quality Summary Metadata are included as name/value pair items under the granule level metadata attribute “N_Quality_Summary”. The listed name/value pair items in the table are the granule level quality summary flags for the

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CrIS SDRs.

Table 2.6.4-1, CrIS SDR Quality Summary Metadata Values

N_Quality_Summary			
Name	**Value**	**Description**	**Comments**
Summary CrIS RDR Quality	0 – 100 %	Percentage of good quality earth view observations in granule	
Summary CrIS SDR Quality	0 – 100 %	Percentage of good quality earth view observations in granule	
Invalid Radiometric Calibration Yield	0 – 100 %	Percentage of calibrations that are invalid - Indicates the quality of the radiometric calibration	

2.6.5 CrIS SDR Geolocation Content Summary

Table 2.6.5-1, CrIS SDR Geolocation Data Content Summary

Name	Description	Data Type	Aggregate Dimension (N = Number of Granules)	Granule Dimension	Units
FORTime	Time for each FOR in IET (1/1/1958)	64-bit integer	[N*4, 30]	[4, 30]	microsecond
StartTime	Starting time of scan in IET (1/1/1958)	64-bit integer	[N*4]	[4]	microsecond
MidTime	Mid time of scan in IET (1/1/1958)	64-bit integer	[N*4]	[4]	microsecond
Latitude	Latitude (positive North) of the geolocated FOV center	32-bit floating point	[N*4, 30, 9]	[4, 30, 9]	degree
Longitude	Longitude (positive East) of the geolocated FOV center	32-bit floating point	[N*4,30, 9]	[4, 30, 9]	degree
SolarZenithAngle	Zenith angle of sun at the geolocated FOV center	32-bit floating point	[N*4, 30, 9]	[4, 30, 9]	degree
SolarAzimuthAngle	Azimuth angle of sun (measured clockwise positive from North) at the geolocated FOV center	32-bit floating point	[N*4, 30, 9]	[4, 30, 9]	degree

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Name	Description	Data Type	Aggregate Dimension (N = Number of Granules)	Granule Dimension	Units
SatelliteZenithAngle	Zenith angle to satellite at the geolocated FOV center	32-bit floating point	[N*4, 30, 9]	[4, 30, 9]	degree
SatelliteAzimuthAngle	Azimuth angle (measured clockwise positive from North) to satellite at the geolocated FOV center	32-bit floating point	[N*4, 30, 9]	[4, 30, 9]	degree
Height	Ellipsoid-Geoid separation	32-bit floating point	[N*4, 30, 9]	[4, 30, 9]	meter
SatelliteRange	Line of sight distance from the ellipsoid intersection to the satellite	32-bit floating point	[N*4, 30, 9]	[4, 30, 9]	meter
SCPosition	Spacecraft position in ECR Coordinates (X, Y, Z) at the mid-time of scan	32-bit floating point	[N*4, 3]	[4, 3]	meter
SCVelocity	Spacecraft velocity in ECR Coordinates (dx/dt, dy/dt, dz/dt) at the mid-time of scan	32-bit floating point	[N*4, 3]	[4, 3]	m/s
SCAttitude	Spacecraft attitude with respect to the Geodetic Reference Frame Coordinates (roll, pitch, yaw) at the mid-time of scan	32-bit floating point	[N*4, 3]	[4, 3]	arcsecond
QF1_CRISSDRGEO	Attitude and Ephemeris availability status	unsigned 8-bit char	[N*4]	[4]	unitless
PadByte1	Pad byte	unsigned 8-bit char	[N*4]	[4]	unitless

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2.6.6 CrIS SDR Geolocation Product Profile

Table 2.6.6-1, CrIS SDR Geolocation Product Profile

Name	Data Size	Dimensions													
FORTime	8byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**									
		Scan	Yes	No	4	4									
		FOR	No	No	30	30									
		Datum													
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**			
		Time for each FOR in IET (1/1/1958)	0			microsecond	No		64-bit integer	**Name**	**Value**	**Name**	**Value**		
										NA_INT64_FILL	-999				
										MISS_INT64_FILL	-998				
										ERR_INT64_FILL	-995				
										VDNE_INT64_FILL	-993				
StartTime	8byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**									
		Scan	Yes	No	4	4									
		Datum													
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**			
		Starting time of scan in IET (1/1/1958)	0			microsecond	No		64-bit integer	**Name**	**Value**	**Name**	**Value**		
										NA_INT64_FILL	-999				
										MISS_INT64_FILL	-998				
										ERR_INT64_FILL	-995				
										VDNE_INT64_FILL	-993				
MidTime	8byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**									
		Scan	Yes	No	4	4									
		Datum													
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**			
		Mid time of	0			microsecond	No		64-bit	**Name**	**Value**	**Name**	**Value**		

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		scan in IET (1/1/1958)							integer	NA_INT64_FILL	-999	
										MISS_INT64_FILL	-998	
										ERR_INT64_FILL	-995	
										VDNE_INT64_FILL	-993	

Latitude — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	4	4
FOR	No	No	30	30
FOV	No	No	9	9

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Latitude (positive North) of the geolocated FOV center	0	-90	90	degree	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

Longitude — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	4	4
FOR	No	No	30	30
FOV	No	No	9	9

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Longitude (positive East) of the geolocated FOV center	0	-180	180	degree	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

SolarZenithAngle — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	4	4
FOR	No	No	30	30
FOV	No	No	9	9

Datum

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		Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
		Zenith angle of sun at the geolocated FOV center	0	0	180	degree	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
										NA_FLOAT32_FILL	-999.9		
										MISS_FLOAT32_FILL	-999.8		
										ERR_FLOAT32_FILL	-999.5		
										VDNE_FLOAT32_FILL	-999.3		

SolarAzimuthAngle — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	4	4
FOR	No	No	30	30
FOV	No	No	9	9

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Azimuth angle of sun (measured clockwise positive from North) at the geolocated FOV center	0	-180	180	degree	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

SatelliteZenithAngle — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	4	4
FOR	No	No	30	30
FOV	No	No	9	9

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Zenith angle to satellite at the geolocated FOV center	0	0	~70	degree	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		

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										VDNE_FLOAT32_FILL	-999.3	

SatelliteAzimuthAngle — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	4	4
FOR	No	No	30	30
FOV	No	No	9	9

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Azimuth angle (measured clockwise positive from North) to satellite at the geolocated FOV center	0	-180	180	degree	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

Height — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	4	4
FOR	No	No	30	30
FOV	No	No	9	9

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Ellipsoid-Geoid separation	0			meter	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

SatelliteRange — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	4	4
FOR	No	No	30	30
FOV	No	No	9	9

Datum

Description	Datum Offset	Unscaled Valid	Unscaled Valid	Measurement Units	Scaled	Scale Factor	Data Type	Fill Values	Legend Entries

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				Range Min	Range Max			Name					
		Line of sight distance from the ellipsoid intersection to the satellite	0			meter	No		32-bit floating point	Name	Value	Name	Value
										NA_FLOAT32_FILL	-999.9		
										MISS_FLOAT32_FILL	-999.8		
										ERR_FLOAT32_FILL	-999.5		
										VDNE_FLOAT32_FILL	-999.3		

		Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
SCPosition	4byte(s)	Scan	Yes	No	4	4
		ECRCoordinate	No	No	3	3

Datum										
Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries
Spacecraft position in ECR Coordinates (X, Y, Z) at the mid-time of scan	0			meter	No		32-bit floating point	Name	Value	Name Value
								NA_FLOAT32_FILL	-999.9	
								MISS_FLOAT32_FILL	-999.8	
								ERR_FLOAT32_FILL	-999.5	
								VDNE_FLOAT32_FILL	-999.3	

		Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
SCVelocity	4byte(s)	Scan	Yes	No	4	4
		ECRCoordinate	No	No	3	3

Datum										
Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries
Spacecraft velocity in ECR Coordinates (dx/dt, dy/dt, dz/dt) at the mid-time of scan	0			m/s	No		32-bit floating point	Name	Value	Name Value
								NA_FLOAT32_FILL	-999.9	
								MISS_FLOAT32_FILL	-999.8	
								ERR_FLOAT32_FILL	-999.5	
								VDNE_FLOAT32_FILL	-999.3	

		Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
SCAttitude	4byte(s)	Scan	Yes	No	4	4
		GRFCoordinate	No	No	3	3

Datum

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		Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
		Spacecraft attitude with respect to the Geodetic Reference Frame Coordinates (roll, pitch, yaw) at the mid-time of scan	0			arcsecond	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
										NA_FLOAT32_FILL	-999.9		
										MISS_FLOAT32_FILL	-999.8		
										ERR_FLOAT32_FILL	-999.5		
										VDNE_FLOAT32_FILL	-999.3		

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Table 2.6.6-2, CrIS SDR Geolocation Product Profile - Quality Flags

Name	Data Size	Dimensions
QF1_CRISSDRGEO	1byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	4	4

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Attitude and Ephemeris availability status	0			unitless	No		2 bit(s)			Nominal - E&A data available	0
										Missing Data <= Small Gap	1
										Small Gap < Missing Data < Granule Boundary	2
										Missing Data >= Granule Boundary	3
Spare	2			unitless	No		6 bit(s)	Name	Value	Name	Value

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	4	4

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Pad byte	0			unitless	No		unsigned 8-bit char				

2.6.7 CrIS SDR Geolocation HDF5 Details

Figure 2.6.7-1 provides the details on the content and data types of the CrIS SDR Geolocation. This UML diagram provides details at the product level only. In addition to this UML diagram, refer to Figure 2.2-1, Generalized UML Diagram for HDF5 SDR/TDR Files, for a complete UML rendering of this product.

CrIS-SDR-GEO
+FORTime : H5T_NATIVE_LLONG +StartTime : H5T_NATIVE_LLONG +MidTime : H5T_NATIVE_LLONG +Latitude : H5T_NATIVE_FLOAT +Longitude : H5T_NATIVE_FLOAT +SolarZenithAngle : H5T_NATIVE_FLOAT +SolarAzimuthAngle : H5T_NATIVE_FLOAT +SatelliteZenithAngle : H5T_NATIVE_FLOAT +SatelliteAzimuthAngle : H5T_NATIVE_FLOAT +Height : H5T_NATIVE_FLOAT +SatelliteRange : H5T_NATIVE_FLOAT +SCPosition : H5T_NATIVE_FLOAT +SCVelocity : H5T_NATIVE_FLOAT +SCAttitude : H5T_NATIVE_FLOAT +QF1_CRISSDRGEO : H5T_NATIVE_UCHAR +PadByte1 : H5T_NATIVE_UCHAR

Figure 2.6.7-1, CrIS SDR Geolocation UML Diagram

2.6.8 CrIS SDR Geolocation Metadata Details

There are no quality summary metadata items in the CrIS SDR Geolocation.

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2.7 Advanced - Data Collection System SDR

Data Mnemonic (NPOESS Only)	SDRE-ADSD-C0030
Description/ Purpose	EDFCB3-TBR-8783 Advanced Data Collection System (A-DCS) telemetry converted into engineering units.
File-Naming Construct	See the CDFCB-X Volume I, D34862-01, Section 3.0 for details.
File Size	EDFCB3-TBD-8784
File Format Type	HDF5
Data Content and Data Format	EDFCB3-TBD-8786

2.7.1 A-DCS SDR Product Profile

EDFCB3-TBD-8787

2.7.2 A-DCS SDR HDF5 Details

EDFCB3-TBD-8788

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2.8 DELETED

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2.9 Ozone Mapping and Profiler Suite (OMPS) Nadir Profile SDRs

Data Mnemonic	SDRE-OMPS-C0030 Nadir Profile (Science) SDRE-OMPS-C0031 Calibration GEOE-OMPS-C0030 Geolocation - ellipsoid
Description/ Purpose	The OMPS raw sensor data is decommutated, corrected, and calibrated by the SDR software and then stored in the Nadir Profile (NP) SDR product. In addition to the data needed to support IP/EDR generation, the NP SDR includes a number of other parameters described in more detail in Section 2.9.1, OMPS Nadir Profile SDR Format. In addition to the production of the NP SDR, the generation of special Calibration SDRs supports the on-going, continuous calibration of the NP sensor. The Calibration SDR is described in Section 2.9.2, OMPS Nadir Profile Calibration SDR Format. The OMPS nadir sensor uses a wide field-of-view push-broom telescope to feed two separate spectrometers. The nadir profile spectrometer measures the scene radiance between approximately 250 and 310 nanometers (nm) with a resolution of 1 nm sampled every 0.42 nm. In the parameters described below certain array dimensions are sized to a maximum expected value to allow some flexibility in sensor and algorithm configuration. For example, the actual number of Integrated Field of Views (IFOVs), Swaths, and Spectral Pixels could change based on the configuration. In the case where actual data does not complete the array, fill values (Does Not Exist) are used. For these three dimensions, parameters available in the product indicate the number of actual values to be interpreted. Example geospatial coverage: The across-track pixels are binned into a single IFOV within a single swath (time integration), per granule. The IFOV is 250 km cross track with a 250 km along track. The 250km along track interval is a result of the pixel extent combined with the spacecraft motion during the 37.44 second integration time. The OMPS NP SDR is used in the generation of the Ozone EDR/IPs.
File-Naming Construct	See the CDFCB-X Volume I, D34862-01, Section 3.0 for details.
File Size	Science: 43.97 KiB Science Geolocation: 2.04 KiB Calibration: 108,152.11 KiB

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	Calibration Geolocation: 12.90 KiB Sizes are for a single granule without HDF5 overhead.
File Format Type	HDF5
Data Content and Data Format	The NP SDR format is described in Section 2.9.1, OMPS NP SDR Format, and the NP Calibration SDR format is described in Section 2.9.2, OMPS NP Calibration SDR Format.

2.9.1 OMPS NP SDR Format

The OMPS NP SDR format is described in the following subparagraphs.

2.9.1.1 OMPS NP SDR Data Content Summary

The OMPS NP SDR product structure contains the data arrays shown below in Table 2.9.1.1-1, OMPS NP SDR Data Content Summary.

Table 2.9.1.1-1, OMPS NP SDR Data Content Summary

Name	Description	Data Type	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
SmearDataEarth	Raw smear counts of Earth image	32-bit floating point	[N*5, 1, 200]	[5, 1, 200]	count
RadianceEarth	Calibrated Earth View Radiances	32-bit floating point	[N*5, 5, 200]	[5, 5, 200]	W/(cm^3•sr)
Wavelengths	Wavelengths used in SDR processing (wref)	64-bit floating point	[N*5, 200]	[5, 200]	nanometer
SolarFlux	Reference solar flux from calibration database (rsf_piece)	32-bit floating point	[N*5, 200]	[5, 200]	W/cm^3
Bias1	Average electronics bias CCD Side 1	32-bit floating point	[N]	[1]	count
DarkCurrentEarth	Dark current in earth data (dark_piece)	32-bit floating point	[N*6, 200]	[6, 200]	count
DarkExposeEarth	Integration time for dark data (expose_dark)	64-bit floating point	[N]	[1]	second

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Name	Description	Data Type	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
Cal	Radiometric calibration	32-bit floating point	[N*5, 200]	[5, 200]	W/(cm^3•sr)
NumberOfSwaths	Number of actual swaths in granule	16-bit integer	[N]	[1]	unitless
NumberOfIFOVs	Number of actual IFOVs	16-bit integer	[N]	[1]	unitless
NumberOfSpectralPixels	Number of actual spectral pixels	16-bit integer	[N]	[1]	unitless
LinearityTblVersion	Version and Profile ID of on-board Linearity Table from RDR	unsigned 16-bit integer	[N*2]	[2]	unitless
GainTblVersion	Version and Profile ID of on-board Gain Table from RDR	unsigned 16-bit integer	[N*2]	[2]	unitless
BadCal	Cal factor is out of date (greater than 28 days old)	unsigned 8-bit char	[N]	[1]	unitless
SunGlint	Sun glint indication (scattering angle and surface type thresholds)	unsigned 8-bit char	[N*5, 5]	[5, 5]	unitless
SolarEclipse	All or part of the IFOV is affected by a solar eclipse, umbra or penumbra viewing.	unsigned 8-bit char	[N*5, 5]	[5, 5]	unitless
WaveFlag	Wavelength limits exceeded	unsigned 8-bit char	[N*5, 5]	[5, 5]	unitless
RadFlag	Ratio of the median radiance per spatial FOV to the maximum	32-bit floating point	[N*5, 5]	[5, 5]	unitless
NPLinearCorrection	Indicates Linearity Correction performed inflight	unsigned 8-bit char	[N*5]	[5]	unitless
SAA	Spacecraft within South Atlantic Anomaly (extent in percent based on Climatological data)	unsigned 8-bit char	[N*5]	[5]	unitless

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Name	Description	Data Type	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
QualityEarth	Earth processing reliability (cumulative relative quality indicator count)	16-bit integer	[N*5]	[5]	unitless

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2.9.1.2 OMPS NP SDR – Product Profile Data

Table 2.9.1.2-1, OMPS NP SDR Product Profile

Name	Data Size	Dimensions
SmearDataEarth	4byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Swath	Yes	No	5	5
CCD	No	No	1	1
SpectralPixel	No	No	200	200

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Raw smear counts of Earth image	0			count	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

RadianceEarth	4byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Swath	Yes	No	5	5
IFOV	No	No	5	5
SpectralPixel	No	No	200	200

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Calibrated Earth View Radiances	0			W/(cm^3•sr)	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

Wavelengths	8byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
IFOV	Yes	No	5	5

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		SpectralPixel	No		No	200		200						
		Datum												
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**		
		Wavelengths used in SDR processing (wref)	0			nanometer	No		64-bit floating point	**Name**	**Value**	**Name**	**Value**	
										NA_FLOAT64_FILL	-999.9			
										MISS_FLOAT64_FILL	-999.8			
										ERR_FLOAT64_FILL	-999.5			
										VDNE_FLOAT64_FILL	-999.3			
SolarFlux	4byte(s)	**Name**	**Granule Boundary**		**Dynamic**	**Min Array Size**		**Max Array Size**						
		IFOV	Yes		No	5		5						
		SpectralPixel	No		No	200		200						
		Datum												
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**		
		Reference solar flux (rsf_piece)	0			W/cm^3	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**	
										NA_FLOAT32_FILL	-999.9			
										MISS_FLOAT32_FILL	-999.8			
										ERR_FLOAT32_FILL	-999.5			
										VDNE_FLOAT32_FILL	-999.3			
Bias1	4byte(s)	**Name**	**Granule Boundary**		**Dynamic**	**Min Array Size**		**Max Array Size**						
		Granule	Yes		No	1		1						
		Datum												
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**		
		Average electronics bias CCD Side 1	0			count	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**	
										NA_FLOAT32_FILL	-999.9			
										MISS_FLOAT32_FILL	-999.8			
										ERR_FLOAT32_FILL	-999.5			
										VDNE_FLOAT32_FILL	-999.3			
DarkCurrentEarth	4byte(s)	**Name**	**Granule Boundary**		**Dynamic**	**Min Array Size**		**Max Array Size**						
		IFOV	Yes		No	6		6						

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		SpectralPixel	No		No	200	200								
		Datum													
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**			
		Dark current in earth data (dark_piece)	0			count	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**		
										NA_FLOAT32_FILL	-999.9				
										MISS_FLOAT32_FILL	-999.8				
										ERR_FLOAT32_FILL	-999.5				
										VDNE_FLOAT32_FILL	-999.3				
DarkExposeEarth	8byte(s)	**Name**	**Granule Boundary**		**Dynamic**	**Min Array Size**	**Max Array Size**								
		Granule	Yes		No	1	1								
		Datum													
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**			
		Integration time for dark data (expose_dark)	0			second	No		64-bit floating point	**Name**	**Value**	**Name**	**Value**		
										NA_FLOAT64_FILL	-999.9				
										MISS_FLOAT64_FILL	-999.8				
										ERR_FLOAT64_FILL	-999.5				
										VDNE_FLOAT64_FILL	-999.3				
Cal	4byte(s)	**Name**	**Granule Boundary**		**Dynamic**	**Min Array Size**	**Max Array Size**								
		IFOV	Yes		No	5	5								
		SpectralPixel	No		No	200	200								
		Datum													
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**			
		Radiometric calibration	0			W/(cm^3•sr)	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**		
										NA_FLOAT32_FILL	-999.9				
										MISS_FLOAT32_FILL	-999.8				
										ERR_FLOAT32_FILL	-999.5				
										VDNE_FLOAT32_FILL	-999.3				
NumberOfSwaths	2byte(s)	**Name**	**Granule Boundary**		**Dynamic**	**Min Array Size**	**Max Array Size**								
		Granule	Yes		No	1	1								

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		Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Number of actual swaths in granule	0			unitless	No		16-bit integer	**Name**	**Value**	**Name**	**Value**
								NA_INT16_FILL	-999		
								MISS_INT16_FILL	-998		
								ERR_INT16_FILL	-995		
								VDNE_INT16_FILL	-993		

NumberOfIFOVs — 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	1	1

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Number of actual IFOVs	0			unitless	No		16-bit integer	**Name**	**Value**	**Name**	**Value**
								NA_INT16_FILL	-999		
								MISS_INT16_FILL	-998		
								ERR_INT16_FILL	-995		
								VDNE_INT16_FILL	-993		

NumberOfSpectralPixels — 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	1	1

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Number of actual spectral pixels	0			unitless	No		16-bit integer	**Name**	**Value**	**Name**	**Value**
								NA_INT16_FILL	-999		
								MISS_INT16_FILL	-998		
								ERR_INT16_FILL	-995		
								VDNE_INT16_FILL	-993		

LinearityTblVersion — 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	2	2

Datum

Description	Datum	Unscaled	Unscaled	Measurement	Scaled	Scale	Data	Fill Values	Legend

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			Offset	Valid Range Min	Valid Range Max	Units		Factor Name	Type		Entries
		Version and Profile ID of on-board Linearity Table from RDR	0			unitless	No		unsigned 16-bit integer	Name / Value NA_INT16_FILL / -999 MISS_INT16_FILL / -998 ERR_INT16_FILL / -995 VDNE_INT16_FILL / -993	Name / Value

GainTblVersion — 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	2	2

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Version and Profile ID of on-board Gain Table from RDR	0			unitless	No		unsigned 16-bit integer	Name / Value NA_INT16_FILL / -999 MISS_INT16_FILL / -998 ERR_INT16_FILL / -995 VDNE_INT16_FILL / -993	Name / Value

BadCal — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	1	1

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Cal factor is out of date (greater than 28 days old)	0			unitless	No		unsigned 8-bit char	Name / Value NA_UINT8_FILL / 255 MISS_UINT8_FILL / 254 ERR_UINT8_FILL / 251 VDNE_UINT8_FILL / 249	Name / Value False / 0 True / 1

SunGlint — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Swath	Yes	No	5	5
IFOV	No	No	5	5

Datum

Description	Datum Offset	Unscaled Valid	Unscaled Valid	Measurement Units	Scaled	Scale Factor	Data Type	Fill Values	Legend Entries

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				Range Min	Range Max			Name					
		Sun glint indication (scattering angle and surface type thresholds)	0			unitless	No		unsigned 8-bit char	Name / Value: NA_UINT8_FILL 255; MISS_UINT8_FILL 254; ERR_UINT8_FILL 251; VDNE_UINT8_FILL 249		Name / Value: False 0; True 1	

SolarEclipse — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Swath	Yes	No	5	5
IFOV	No	No	5	5

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
All or part of the IFOV is affected by a solar eclipse, umbra or penumbra viewing.	0			unitless	No		unsigned 8-bit char	Name	Value	Name	Value
								NA_UINT8_FILL	255	False	0
								MISS_UINT8_FILL	254	True	1
								ERR_UINT8_FILL	251		
								VDNE_UINT8_FILL	249		

WaveFlag — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Swath	Yes	No	5	5
IFOV	No	No	5	5

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Wavelength limits exceeded	0			unitless	No		unsigned 8-bit char	Name	Value	Name	Value
								NA_UINT8_FILL	255	False	0
								MISS_UINT8_FILL	254	True	1
								ERR_UINT8_FILL	251		
								VDNE_UINT8_FILL	249		

RadFlag — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Swath	Yes	No	5	5
IFOV	No	No	5	5

Datum

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		Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
		Ratio of the median radiance per spatial FOV to the maximum	0			unitless	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
										NA_FLOAT32_FILL	-999.9		
										MISS_FLOAT32_FILL	-999.8		
										ERR_FLOAT32_FILL	-999.5		
										VDNE_FLOAT32_FILL	-999.3		

		Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
NPLinearCorrection	1byte(s)	Swath	Yes	No	5	5

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Linearity Correction performed inflight	0			unitless	No		unsigned 8-bit char	**Name**	**Value**	**Name**	**Value**
								NA_UINT8_FILL	255	False	0
								MISS_UINT8_FILL	254	True	1
								ERR_UINT8_FILL	251		
								VDNE_UINT8_FILL	249		

		Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
SAA	1byte(s)	Swath	Yes	No	5	5

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Spacecraft within South Atlantic Anomaly (extent in percent based on Climatological data)	0			unitless	No		unsigned 8-bit char	Name	Value	**Name**	**Value**
										0% <= SAA <= 10%	0
										10% < SAA <= 20%	1
										20% < SAA <= 30%	2
										30% < SAA <=	3

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											40%	
											40% < SAA <= 50%	4
											50% < SAA <= 60%	5
											60% < SAA <= 70%	6
											70% < SAA <= 80%	7
											80% < SAA	8

QualityEarth	2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Swath	Yes	No	5	5

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Earth processing reliability (cumulative relative quality indicator count)	0			unitless	No		16-bit integer	NA_INT16_FILL	-999		
								MISS_INT16_FILL	-998		
								ERR_INT16_FILL	-995		
								VDNE_INT16_FILL	-993		

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2.9.1.3 OMPS NP SDR HDF5 Details

Figure 2.9.1.3-1, OMPS NP SDR UML Diagram, provides the details on the content and data types of the OMPS NP SDR. This UML diagram provides details at the granule level only. In addition to this UML diagram, refer to Section 2.1, Sensor Data Records and Temperature Data Records HDF5 Details, Figure 2.2-1, Generalized UML Diagram for HDF5 SDR/TDR Files, for a complete UML rendering of this product.

The OMPS NP SDR within the HDF5 files can be found within the Data Products group with the group name of OMPS-NP-SDR. The aggregation and granule(s) contain the data fields listed in the UML diagrams. The corresponding HDF5 data type for each field is also provided.

OMPS-NP-SDR
+SmearDataEarth : H5T_NATIVE_FLOAT +RadianceEarth : H5T_NATIVE_FLOAT +Wavelengths : H5T_NATIVE_DOUBLE +SolarFlux : H5T_NATIVE_FLOAT +Bias1 : H5T_NATIVE_FLOAT +DarkCurrentEarth : H5T_NATIVE_FLOAT +DarkExposeEarth : H5T_NATIVE_DOUBLE +Cal : H5T_NATIVE_FLOAT +NumberOfSwaths : H5T_NATIVE_SHORT +NumberOfIFOVs : H5T_NATIVE_SHORT +NumberOfSpectralPixels : H5T_NATIVE_SHORT +LinearityTblVersion : H5T_NATIVE_USHORT +GainTblVersion : H5T_NATIVE_USHORT +BadCal : H5T_NATIVE_UCHAR +SunGlint : H5T_NATIVE_UCHAR +SolarEclipse : H5T_NATIVE_UCHAR +WaveFlag : H5T_NATIVE_UCHAR +RadFlag : H5T_NATIVE_FLOAT +NPLinearCorrection : H5T_NATIVE_UCHAR +SAA : H5T_NATIVE_UCHAR +QualityEarth : H5T_NATIVE_SHORT

Figure 2.9.1.3-1, OMPS NP SDR UML Diagram

2.9.1.4 OMPS NP SDR HDF5 Metadata Details

The HDF5 metadata elements associated with the OMPS NP SDR are listed in the CDFCB-X Volume V, Section 4.3, HDF5 (Metadata) Hierarchy. The OMPS NP SDR metadata includes all common metadata at the root, product, aggregation, and granule levels. In addition to the common metadata items for this product, Table 2.9.1.4-1, OMPS NP SDR N_Quality_Summary Granule Level Metadata Values, provides the following items as name/value pairs under the granule level metadata attribute

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"N_Quality_Summary".

Table 2.9.1.4-1, OMPS NP SDR N_Quality_Summary Granule Level Metadata Values

N_Quality_Summary		
Name	**Value**	**Description**
Pixel	0 – 100 %	Percentage of good pixels

2.9.1.5 OMPS NP SDR Geolocation Content Summary

The OMPS NP SDR geolocation data arrays structures are summarized below in Table 2.9.1.5-1, OMPS NP SDR Geolocation Data Array Summary.

Table 2.9.1.5-1, OMPS NP SDR Geolocation Data Content Summary

Name	Description	Data Type	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
StartTime	Starting Time of Swath in IET (1/1/1958)	64-bit integer	[N*5]	[5]	microsecond
MidTime	Mid Time of Swath in IET (1/1/1958)	64-bit integer	[N*5]	[5]	microsecond
Latitude	Latitude of each IFOV (positive North)	32-bit floating point	[N*5, 5]	[5, 5]	degree
Longitude	Longitude of each IFOV (positive East)	32-bit floating point	[N*5, 5]	[5, 5]	degree
LatitudeCorners	Latitude of each IFOV Corner – Array starts at upper right and proceeds clockwise	32-bit floating point	[N*5, 5, 4]	[5, 5, 4]	degree
LongitudeCorners	Longitude of each IFOV Corner - Array starts at upper right and proceeds clockwise	32-bit floating point	[N*5, 5, 4]	[5, 5, 4]	degree
SolarZenithAngle	Zenith angle of sun at each IFOV position	32-bit floating point	[N*5, 5]	[5, 5]	degree

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Name	Description	Data Type	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
SolarAzimuthAngle	Azimuth angle of sun (measured clockwise positive from North) at each IFOV position	32-bit floating point	[N*5, 5]	[5, 5]	degree
SatelliteZenithAngle	Zenith angle to satellite at each IFOV position	32-bit floating point	[N*5, 5]	[5, 5]	degree
SatelliteAzimuthAngle	Azimuth angle (measured clockwise positive from North) to Satellite at each IFOV position	32-bit floating point	[N*5, 5]	[5, 5]	degree
RelativeAzimuthAngle	Difference between solar and satellite azimuth angles at each IFOV position (solar – satellite)	32-bit floating point	[N*5, 5]	[5, 5]	degree
Height	Ellipsoid-Geoid separation	32-bit floating point	[N*5, 5]	[5, 5]	meter
SatelliteRange	Line of sight distance from the ellipsoid intersection to the satellite	32-bit floating point	[N*5, 5]	[5, 5]	meter
MoonVector	Lunar position in Spacecraft Coordinates at MidTime	32-bit floating point	[N*5, 3]	[5, 3]	meter
SunVector	Solar position in Spacecraft Coordinates at MidTime	32-bit floating point	[N*5, 3]	[5, 3]	meter
SCPosition	Spacecraft position in ECR Coordinates (X, Y, Z) at MidTime	32-bit floating point	[N*5, 3]	[5, 3]	meter

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Name	Description	Data Type	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
SCVelocity	Spacecraft velocity in ECR Coordinates (dx/dt, dy/dt, dz/dt) at MidTime	32-bit floating point	[N*5, 3]	[5, 3]	m/s
SCAttitude	Spacecraft attitude with respect to the Geodetic Reference Frame (roll, pitch, yaw) at MidTime	32-bit floating point	[N*5, 3]	[5, 3]	arcsecond
NumberOfSwaths	Number of actual swaths in granule	16-bit integer	[N]	[1]	unitless
NumberOfIFOVs	Number of actual IFOVs	16-bit integer	[N]	[1]	unitless
QF1_OMPSNPGEO	Attitude/Ephemeris availability status	unsigned 8-bit char	[N*5]	[5]	unitless

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2.9.1.6 OMPS NP SDR Geolocation Product Profile

Table 2.9.1.6-1, OMPS NP SDR Geolocation Product Profile

Fields																
Name	**Data Size**	**Dimensions**														
StartTime	8byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**										
		Swath	Yes	No	5	5										
		Datum														
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**				
		Starting Time of Swath in IET (1/1/1958)	0			microsecond	No		64-bit integer	**Name**	**Value**	**Name**	**Value**			
										NA_INT64_FILL	-999					
										MISS_INT64_FILL	-998					
										ERR_INT64_FILL	-995					
										VDNE_INT64_FILL	-993					
MidTime	8byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**										
		Swath	Yes	No	5	5										
		Datum														
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**				
		Mid Time of Swath in IET (1/1/1958)	0			microsecond	No		64-bit integer	**Name**	**Value**	**Name**	**Value**			
										NA_INT64_FILL	-999					
										MISS_INT64_FILL	-998					
										ERR_INT64_FILL	-995					
										VDNE_INT64_FILL	-993					
Latitude	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**										
		Swath	Yes	No	5	5										
		IFOV	No	No	5	5										
		Datum														
		Description	**Datum Offset**	**Unscaled Valid Range**	**Unscaled Valid Range**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**				

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				Min	Max							
		Latitude of each IFOV (positive North)	0	-90	90	degree	No		32-bit floating point	Name / Value: NA_FLOAT32_FILL -999.9; MISS_FLOAT32_FILL -999.8; ERR_FLOAT32_FILL -999.5; VDNE_FLOAT32_FILL -999.3	Name / Value	

Longitude — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Swath	Yes	No	5	5
IFOV	No	No	5	5

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Longitude of each IFOV (positive East)	0	-180	180	degree	No		32-bit floating point	Name / Value: NA_FLOAT32_FILL -999.9; MISS_FLOAT32_FILL -999.8; ERR_FLOAT32_FILL -999.5; VDNE_FLOAT32_FILL -999.3	Name / Value

LatitudeCorners — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Swath	Yes	No	5	5
IFOV	No	No	5	5
Corner	No	No	4	4

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Latitude of each IFOV corner – Array starts at upper right and proceeds clockwise	0	-90	90	degree	No		32-bit floating point	Name / Value: NA_FLOAT32_FILL -999.9; MISS_FLOAT32_FILL -999.8; ERR_FLOAT32_FILL -999.5; VDNE_FLOAT32_FILL -999.3	Name / Value

LongitudeCorners — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Swath	Yes	No	5	5
IFOV	No	No	5	5
Corner	No	No	4	4

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		Datum										
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Longitude of each IFOV corner – Array starts at upper right and proceeds clockwise	0	-180	180	degree	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
										NA_FLOAT32_FILL	-999.9		
										MISS_FLOAT32_FILL	-999.8		
										ERR_FLOAT32_FILL	-999.5		
										VDNE_FLOAT32_FILL	-999.3		

SolarZenithAngle	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**
		Swath	Yes	No	5	5
		IFOV	No	No	5	5

		Datum										
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Zenith angle of sun at each IFOV position	0	0	180	degree	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
										NA_FLOAT32_FILL	-999.9		
										MISS_FLOAT32_FILL	-999.8		
										ERR_FLOAT32_FILL	-999.5		
										VDNE_FLOAT32_FILL	-999.3		

SolarAzimuthAngle	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**
		Swath	Yes	No	5	5
		IFOV	No	No	5	5

		Datum										
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Azimuth angle of sun (measured clockwise positive from North) at each IFOV position	0	-180	180	degree	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
										NA_FLOAT32_FILL	-999.9		
										MISS_FLOAT32_FILL	-999.8		
										ERR_FLOAT32_FILL	-999.5		
										VDNE_FLOAT32_FILL	-999.3		

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SatelliteZenithAngle — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Swath	Yes	No	5	5
IFOV	No	No	5	5

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Zenith angle to satellite at each IFOV position	0	0	~70	degree	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

SatelliteAzimuthAngle — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Swath	Yes	No	5	5
IFOV	No	No	5	5

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Azimuth angle (measured clockwise positive from North) to Satellite at each IFOV position	0	-180	180	degree	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

RelativeAzimuthAngle — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Swath	Yes	No	5	5
IFOV	No	No	5	5

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Difference between solar and satellite azimuth angles	0	-180	180	degree	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		

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		at each IFOV position (solar – satellite)								ERR_FLOAT32_FILL VDNE_FLOAT32_FILL	-999.5 -999.3	

Height — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Swath	Yes	No	5	5
IFOV	No	No	5	5

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Ellipsoid-Geoid separation	0			meter	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

SatelliteRange — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Swath	Yes	No	5	5
IFOV	No	No	5	5

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Line of sight distance from the ellipsoid intersection to the satellite	0			meter	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

MoonVector — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Swath	Yes	No	5	5
SCCoordinate	No	No	3	3

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries

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		Lunar Position in Spacecraft Coordinates at MidTime	0			meter	No		32-bit floating point	**Name** / **Value**: NA_FLOAT32_FILL -999.9; MISS_FLOAT32_FILL -999.8; ERR_FLOAT32_FILL -999.5; VDNE_FLOAT32_FILL -999.3	**Name** / **Value**	

SunVector — 4byte(s)

Name	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**
Swath	Yes	No	5	5
SCCoordinate	No	No	3	3

Datum

Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
Solar position in Spacecraft Coordinates at MidTime	0			meter	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

SCPosition — 4byte(s)

Name	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**
Swath	Yes	No	5	5
ECRCoordinate	No	No	3	3

Datum

Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
Spacecraft position in ECR Coordinates (X, Y, Z) at MidTime	0			meter	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

SCVelocity — 4byte(s)

Name	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**
Swath	Yes	No	5	5
ECRCoordinate	No	No	3	3

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		Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Spacecraft velocity in ECR Coordinates (dx/dt, dy/dt, dz/dt) at MidTime	0			m/s	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

SCAttitude	4byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Swath	Yes	No	5	5
GRFCoordinate	No	No	3	3

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Spacecraft attitude with respect to the Geodetic Reference Frame (roll, pitch, yaw) at MidTime.	0			arcsecond	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

NumberOfSwaths	2byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	1	1

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Number of actual swaths in granule	0			unitless	No		16-bit integer	**Name**	**Value**	**Name**	**Value**
								NA_INT16_FILL	-999		
								MISS_INT16_FILL	-998		
								ERR_INT16_FILL	-995		
								VDNE_INT16_FILL	-993		

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NumberOfIFOVs	2byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**							
		Granule	Yes	No	1	1							
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Number of actual IFOVs	0			unitless	No		16-bit integer	**Name**	**Value**	**Name**	**Value**
										NA_INT16_FILL	-999		
										MISS_INT16_FILL	-998		
										ERR_INT16_FILL	-995		
										VDNE_INT16_FILL	-993		

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Table 2.9.1.6-2, OMPS NP SDR Geolocation Product Profile – Quality Flags

Name	Data Size	Dimensions
QF1_OMPSNPGEO	1byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Swath	Yes	No	5	5

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Attitude and Ephemeris availability status	0			unitless	No		2 bit(s)			Nominal - E&A data available	0
										Missing Data <= Small Gap	1
										Small Gap < Missing Data < Granule Boundary	2
										Missing Data >= Granule Boundary	3
Spare	2			unitless	No		6 bit(s)	Name	Value	Name	Value

2.9.1.7 OMPS NP SDR Geolocation HDF5 Details

The OMPS NP SDR Geolocation is based on a simple spatial average over the geometric cell bounds, regardless of pixel sampling. Geolocation is reported on the ellipsoid. Figure 2.9.1.7-1, OMPS NP SDR Geolocation UML Diagram, provides details on the contents and data types of the OMPS NP SDR geolocation.

OMPS-NP-GEO
+StartTime : H5T_NATIVE_LLONG +MidTime : H5T_NATIVE_LLONG +Latitude : H5T_NATIVE_FLOAT +Longitude : H5T_NATIVE_FLOAT +LatitudeCorners : H5T_NATIVE_FLOAT +LongitudeCorners : H5T_NATIVE_FLOAT +SolarZenithAngle : H5T_NATIVE_FLOAT +SolarAzimuthAngle : H5T_NATIVE_FLOAT +SatelliteZenithAngle : H5T_NATIVE_FLOAT +SatelliteAzimuthAngle : H5T_NATIVE_FLOAT +RelativeAzimuthAngle : H5T_NATIVE_FLOAT +Height : H5T_NATIVE_FLOAT +SatelliteRange : H5T_NATIVE_FLOAT +MoonVector : H5T_NATIVE_FLOAT +SunVector : H5T_NATIVE_FLOAT +SCPosition : H5T_NATIVE_FLOAT +SCVelocity : H5T_NATIVE_FLOAT +SCAttitude : H5T_NATIVE_FLOAT +NumberOfSwaths : H5T_NATIVE_SHORT +NumberOfIFOVs : H5T_NATIVE_SHORT +QF1_OMPSNPGEO : H5T_NATIVE_UCHAR

Figure 2.9.1.7-1, OMPS NP SDR Geolocation UML Diagram

2.9.1.8 OMPS NP SDR Geolocation Metadata Details

The HDF5 metadata elements associated with the OMPS NP SDR Geolocation are listed in the CDFCB-X Volume V, Section 4.3, HDF5 (Metadata) Hierarchy. There are no additional metadata elements or granule level quality flags for this geolocation.

2.9.2 OMPS NP Calibration SDR

The OMPS NP calibration SDR dataset and metadata formats are described in the following subparagraphs.

2.9.2.1 OMPS NP Calibration SDR Data Content Summary

The OMPS NP Calibration SDR product structure contains the data arrays shown below in Table 2.9.2.1-1, OMPS NP Calibration SDR Data Array Summary.

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Table 2.9.2.1-1, OMPS NP Calibration SDR Data Content Summary

Name	Description	Data Type	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
Bias1	Average electronics bias CCD side 1	32-bit floating point	[N]	[1]	count
DarkData	Dark current corrected coadded counts	32-bit floating point	[N*364, 390]	[364, 390]	count
DarkCurrentExpose	Exposure time of dark current (expose_dark)	64-bit floating point	[N]	[1]	second
LampExpose	Exposure time of lamp counts (expose_lamp)	64-bit floating point	[N]	[1]	second
BadPixelMap	Map of pixels used for solar data (badpix)	32-bit floating point	[N*200, 370]	[200, 370]	unitless
WavelengthMap	Wavelength map (wmap)	64-bit floating point	[N*200, 370]	[200, 370]	unitless
Flat	Local relative normalized radiometric sensitivities	32-bit floating point	[N*200, 370]	[200, 370]	unitless
NumberOfWorkingSolar	Number of solar frames from working diffuser	16-bit integer	[N]	[1]	unitless
NumberOfReferenceSolar	Number of solar frames from reference diffuser	16-bit integer	[N]	[1]	unitless
NumberOfDark	Number of dark frames (images)	16-bit integer	[N]	[1]	unitless
NumberOfLamp	Number of lamp frames (images)	16-bit integer	[N]	[1]	unitless
NumberOfCoaddsSolar	Number of Co-adds during solar calibration	16-bit integer	[N]	[1]	unitless
NumberOfCoaddsDark	Number of coadds during Dark calibration	16-bit integer	[N]	[1]	unitless

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Name	Description	Data Type	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
NumberOfCoaddsLamp	Number of coadds during Lamp calibration.	16-bit integer	[N]	[1]	unitless
CCD	Count rate of sun (ccd)	64-bit floating point	[N*200, 370]	[200, 370]	count/second
TotalSolarExpose	Total Solar Exposure time (total_sol_expose)	64-bit floating point	[N]	[1]	second
RSFCounts	Reference solar counts (rsf_data)	32-bit floating point	[N*200, 370]	[200, 370]	count
RSFExpose	Reference solar exposure time (rsf_expose)	32-bit floating point	[N]	[1]	second
RawSolar	Raw Solar Radiances	32-bit floating point	[N*27, 364, 200]	[27, 364, 200]	count
SmearDataSolar	Smear Data Solar Radiances	32-bit floating point	[N*27, 200, 2]	[27, 200, 2]	count
SolarBeta1	Angle between orbital plane and sun at start of solar observation	32-bit floating point	[N*27]	[27]	degree
SolarBeta2	Angle between orbital plane and sun at end of solar observation	32-bit floating point	[N*27]	[27]	degree
DiffIncinAngle	Angle from normal of incident solar flux	32-bit floating point	[N*27]	[27]	degree
DiffuserPositionSolar	Starting and ending pixel column for each solar measurement	16-bit integer	[N*27, 2]	[27, 2]	unitless
YearSolar	Year of Solar Observation	32-bit integer	[N*27]	[27]	year
DaySolar	Day of Year for Solar Observation	32-bit integer	[N*27]	[27]	day

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Name	Description	Data Type	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
DiffuserSurfaceSolar	Diffuser Surface used for Solar Calibration	32-bit integer	[N*27]	[27]	unitless
TccdNPSolar	CCD Temperature	16-bit integer	[N*27]	[27]	count
TmotnadSolar	Motor Temperature at Nadir	16-bit integer	[N*27]	[27]	count
TlmpnadSolar	Lamp Temperature at Nadir	16-bit integer	[N*27]	[27]	count
TradnadSolar	Radiator Temperature at Nadir	16-bit integer	[N*27]	[27]	count
Tel1nadSolar	Electronics 1 Temperature at Nadir	16-bit integer	[N*27]	[27]	count
Tel2nadSolar	Electronics 2 Temperature at Nadir	16-bit integer	[N*27]	[27]	count
PccdNPSolar	Profile of CCD	16-bit integer	[N*27]	[27]	count
VtecNPSolar	Voltage of Electronics	16-bit integer	[N*27]	[27]	count
CtecNPSolar	Electronics current	16-bit integer	[N*27]	[27]	count
GonPar	Goniometric correction to solar counts	32-bit floating point	[N*27, 200, 200]	[27, 200, 200]	unitless
FluxData	Final corrected solar counts of individual solar observation	32-bit floating point	[N*27, 364, 200]	[27, 364, 200]	W/cm^3
TccdNPDark	CCD Temperature	16-bit integer	[N*5]	[5]	count
TmotnadDark	Motor Temperature at Nadir	16-bit integer	[N*5]	[5]	count
TlmpnadDark	Lamp Temperature at Nadir	16-bit integer	[N*5]	[5]	count

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Name	Description	Data Type	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
TradnadDark	Radiator Temperature at Nadir	16-bit integer	[N*5]	[5]	count
Tel1nadDark	Electronics 1 Temperature at Nadir	16-bit integer	[N*5]	[5]	count
Tel2nadDark	Electronics 2 Temperature at Nadir	16-bit integer	[N*5]	[5]	count
PccdNPDark	Profile of CCD	16-bit integer	[N*5]	[5]	count
VtecNPDark	Voltage of Electronics	16-bit integer	[N*5]	[5]	count
CtecNPDark	Current of Electronics	16-bit integer	[N*5]	[5]	count
DarkArray	Correct counts of an individual dark current image.	32-bit floating point	[N*5, 364, 390]	[5, 364, 390]	count
TccdNPLamp	CCD Temperature	16-bit integer	[N*150]	[150]	count
TmotnadLamp	Motor Temperature at Nadir	16-bit integer	[N*150]	[150]	count
TlmpnadLamp	Lamp Temperature at Nadir	16-bit integer	[N*150]	[150]	count
TradnadLamp	Radiator Temperature at Nadir	16-bit integer	[N*150]	[150]	count
Tel1nadLamp	Electronics 1 Temperature at Nadir	16-bit integer	[N*150]	[150]	count
Tel2nadLamp	Electronics 2 Temperature at Nadir	16-bit integer	[N*150]	[150]	count
PccdNPLamp	Profile of CCD	16-bit integer	[N*150]	[150]	count
VtecNPLamp	Voltage of Electronics	16-bit integer	[N*150]	[150]	count
CtecNPLamp	Current of Electronics	16-bit integer	[N*150]	[150]	count

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Name	Description	Data Type	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
LampData	Correct counts of an individual lamp image	32-bit floating point	[N*150, 364, 390]	[150, 364, 390]	count
QualityLamp	Reliability of lamp processing	16-bit integer	[N*150]	[150]	unitless
QualitySolar	Reliability of solar processing	16-bit integer	[N*27]	[27]	unitless
QualityDark	Reliability of dark processing	16-bit integer	[N*5]	[5]	unitless
MedianDark	Median dark current	32-bit floating point	[N]	[1]	count
Fitness	Chi-squared goodness of fit for wavelengths	64-bit floating point	[N*5]	[5]	unitless
CompleteFlag	Completeness of solar calibration data	16-bit integer	[N]	[1]	unitless
SAALamp	Spacecraft within South Atlantic Anomaly during lamp calibration (extent in percent based on Climatological data)	unsigned 8-bit char	[N*150]	[150]	unitless
SAASolar	Spacecraft within South Atlantic Anomaly during solar calibration (extent in percent based on Climatological data)	unsigned 8-bit char	[N*27]	[27]	unitless
SAADark	Spacecraft within South Atlantic Anomaly during dark calibration (extent in percent based on Climatological data)	unsigned 8-bit char	[N*5]	[5]	unitless

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Name	Description	Data Type	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
Eclipse	Eclipse - All or part of the S/C is affected by a solar eclipse, umbra or penumbra viewing.	unsigned 8-bit char	[N*27]	[27]	unitless
OccultationFlag	Occultation of the diffuser during solar observation	unsigned 8-bit char	[N*27]	[27]	unitless

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2.9.2.2 OMPS NP Calibration SDR Product Profile

Table 2.9.2.2-1, OMPS NP Calibration SDR Product Profile

Name	Data Size	Dimensions
Bias1	4byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	1	1

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Average electronics bias CCD side 1	0			count	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
SpectralPixel	Yes	No	364	364
SpatialPixel	No	No	390	390

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Dark current corrected coadded counts	0			count	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	1	1

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries

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		Exposure time of dark current (expose_dark)	0			second	No		64-bit floating point	**Name**	**Value**	**Name**	**Value**
										NA_FLOAT64_FILL	-999.9		
										MISS_FLOAT64_FILL	-999.8		
										ERR_FLOAT64_FILL	-999.5		
										VDNE_FLOAT64_FILL	-999.3		

LampExpose	8byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**							
		Granule	Yes	No	1	1							
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Exposure time of lamp counts (expose_lamp)	0			second	No		64-bit floating point	**Name**	**Value**	**Name**	**Value**
										NA_FLOAT64_FILL	-999.9		
										MISS_FLOAT64_FILL	-999.8		
										ERR_FLOAT64_FILL	-999.5		
										VDNE_FLOAT64_FILL	-999.3		

BadPixelMap	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**							
		SpectralPixel	Yes	No	200	200							
		SpatialPixel	No	No	370	370							
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Map of pixels used for solar data (badpix)	0			unitless	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
										NA_FLOAT32_FILL	-999.9		
										MISS_FLOAT32_FILL	-999.8		
										ERR_FLOAT32_FILL	-999.5		
										VDNE_FLOAT32_FILL	-999.3		

WavelengthMap	8byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**							
		SpectralPixel	Yes	No	200	200							
		SpatialPixel	No	No	370	370							
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	

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		Wavelength map (wmap)	0			unitless	No		64-bit floating point	**Name**	**Value**	**Name**	**Value**
										NA_FLOAT64_FILL	-999.9		
										MISS_FLOAT64_FILL	-999.8		
										ERR_FLOAT64_FILL	-999.5		
										VDNE_FLOAT64_FILL	-999.3		

Flat	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**							
		SpectralPixel	Yes	No	200	200							
		SpatialPixel	No	No	370	370							
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Local relative normalized radiometric sensitivities	0			unitless	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
										NA_FLOAT32_FILL	-999.9		
										MISS_FLOAT32_FILL	-999.8		
										ERR_FLOAT32_FILL	-999.5		
										VDNE_FLOAT32_FILL	-999.3		

NumberOfWorkingSolar	2byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**							
		Granule	Yes	No	1	1							
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Number of solar frames from the working diffuser	0			unitless	No		16-bit integer	**Name**	**Value**	**Name**	**Value**
										NA_INT16_FILL	-999		
										MISS_INT16_FILL	-998		
										ERR_INT16_FILL	-995		
										VDNE_INT16_FILL	-993		

NumberOfReferenceSolar	2byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**							
		Granule	Yes	No	1	1							
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Number of solar frames	0			unitless	No		16-bit integer	**Name**	**Value**	**Name**	**Value**
										NA_INT16_FILL	-999		

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		from the reference diffuser								MISS_INT16_FILL ERR_INT16_FILL VDNE_INT16_FILL	-998 -995 -993	

NumberOfDark — 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	1	1

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Number of dark frames (images)	0			unitless	No		16-bit integer	**Name**	**Value**	**Name**	**Value**
								NA_INT16_FILL	-999		
								MISS_INT16_FILL	-998		
								ERR_INT16_FILL	-995		
								VDNE_INT16_FILL	-993		

NumberOfLamp — 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	1	1

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Number of lamp frames (images)	0			unitless	No		16-bit integer	**Name**	**Value**	**Name**	**Value**
								NA_INT16_FILL	-999		
								MISS_INT16_FILL	-998		
								ERR_INT16_FILL	-995		
								VDNE_INT16_FILL	-993		

NumberOfCoaddsSolar — 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	1	1

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Number of co-adds during solar calibration	0			unitless	No		16-bit integer	**Name**	**Value**	**Name**	**Value**
								NA_INT16_FILL	-999		
								MISS_INT16_FILL	-998		
								ERR_INT16_FILL	-995		
								VDNE_INT16_FILL	-993		

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NumberOfCoaddsDark	2byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**									
		Granule	Yes	No	1	1									
		Datum													
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**			
		Number of co-adds during dark calibration	0			unitless	No		16-bit integer	**Name**	**Value**	**Name**	**Value**		
										NA_INT16_FILL	-999				
										MISS_INT16_FILL	-998				
										ERR_INT16_FILL	-995				
										VDNE_INT16_FILL	-993				
NumberOfCoaddsLamp	2byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**									
		Granule	Yes	No	1	1									
		Datum													
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**			
		Number of co-adds during lamp calibration	0			unitless	No		16-bit integer	**Name**	**Value**	**Name**	**Value**		
										NA_INT16_FILL	-999				
										MISS_INT16_FILL	-998				
										ERR_INT16_FILL	-995				
										VDNE_INT16_FILL	-993				
CCD	8byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**									
		SpectralPixel	Yes	No	200	200									
		SpatialPixel	No	No	370	370									
		Datum													
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**			
		Count rate of sun (ccd)	0			count/second	No		64-bit floating point	**Name**	**Value**	**Name**	**Value**		
										NA_FLOAT64_FILL	-999.9				
										MISS_FLOAT64_FILL	-999.8				
										ERR_FLOAT64_FILL	-999.5				
										VDNE_FLOAT64_FILL	-999.3				
TotalSolarExpose	8byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**									
		FOV	Yes	No	1	1									

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		Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Total Solar Exposure time (total_sol_expose)	0			second	No		64-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT64_FILL	-999.9		
								MISS_FLOAT64_FILL	-999.8		
								ERR_FLOAT64_FILL	-999.5		
								VDNE_FLOAT64_FILL	-999.3		

RSFCounts — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
SpectralPixel	Yes	No	200	200
SpatialPixel	No	No	370	370

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Reference solar counts (rsf_data)	0			count	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

RSFExpose — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	1	1

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Reference solar exposure time (rsf_expose)	0			second	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

RawSolar — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Solar	Yes	No	27	27
SpectralPixel	No	No	364	364
SpatialPixel	No	No	200	200

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		Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Raw Solar Radiances	0			count	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

SmearDataSolar	4byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Solar	Yes	No	27	27
SpectralPixel	No	No	200	200
SpatialPixel	No	No	2	2

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Smear Data Solar Radiances	0			count	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

SolarBeta1	4byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Solar	Yes	No	27	27

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Angle between orbital plane and sun at start of solar observation	0			degree	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

SolarBeta2	4byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Solar	Yes	No	27	27

Datum

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		Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
		Angle between orbital plane and sun at end of solar observation	0			degree	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
										NA_FLOAT32_FILL	-999.9		
										MISS_FLOAT32_FILL	-999.8		
										ERR_FLOAT32_FILL	-999.5		
										VDNE_FLOAT32_FILL	-999.3		

		Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
DiffIncinAngle	4byte(s)	Solar	Yes	No	27	27

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Angle from normal of incident solar flux	0			degree	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

		Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
DiffuserPositionSolar	2byte(s)	Solar	Yes	No	27	27
		Time	No	No	2	2

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Starting and Ending pixel column for each solar measurement	0			unitless	No		16-bit integer	**Name**	**Value**	**Name**	**Value**
								NA_INT16_FILL	-999		
								MISS_INT16_FILL	-998		
								ERR_INT16_FILL	-995		
								VDNE_INT16_FILL	-993		

		Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
YearSolar	4byte(s)	Solar	Yes	No	27	27

Datum

Description	Datum	Unscaled	Unscaled	Measurement	Scaled	Scale	Data Type	Fill Values	Legend

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			Offset	Valid Range Min	Valid Range Max	Units		Factor Name			Entries
		Year of Solar Observation	0			year	No		32-bit integer	Name: NA_INT32_FILL, Value: -999 Name: MISS_INT32_FILL, Value: -998 Name: ERR_INT32_FILL, Value: -995 Name: VDNE_INT32_FILL, Value: -993	Name, Value

		Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
DaySolar	4byte(s)	Solar	Yes	No	27	27

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Day of Year for Solar Observation	0			day	No		32-bit integer	Name: NA_INT32_FILL, Value: -999 Name: MISS_INT32_FILL, Value: -998 Name: ERR_INT32_FILL, Value: -995 Name: VDNE_INT32_FILL, Value: -993	Name, Value

		Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
DiffuserSurfaceSolar	4byte(s)	Solar	Yes	No	27	27

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Diffuser Surface used for Solar Calibration	0			unitless	No		32-bit integer	Name: NA_INT32_FILL, Value: -999 Name: MISS_INT32_FILL, Value: -998 Name: ERR_INT32_FILL, Value: -995 Name: VDNE_INT32_FILL, Value: -993	Name, Value

		Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
TccdNPSolar	2byte(s)	Solar	Yes	No	27	27

Datum

Description	Datum Offset	Unscaled Valid Range	Unscaled Valid Range	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries

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				Min	**Max**							
		CCD Temperature	0			count	No		16-bit integer	**Name** / **Value**: NA_INT16_FILL -999; MISS_INT16_FILL -998; ERR_INT16_FILL -995; VDNE_INT16_FILL -993	**Name** / **Value**	

TmotnadSolar — 2byte(s)

Name	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**
Solar	Yes	No	27	27

Datum

Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**	**Legend Entries**
Motor Temperature at Nadir	0			count	No		16-bit integer	**Name** / **Value**: NA_INT16_FILL -999; MISS_INT16_FILL -998; ERR_INT16_FILL -995; VDNE_INT16_FILL -993	**Name** / **Value**

TImpnadSolar — 2byte(s)

Name	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**
Solar	Yes	No	27	27

Datum

Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**	**Legend Entries**
Lamp Temperature at Nadir	0			count	No		16-bit integer	**Name** / **Value**: NA_INT16_FILL -999; MISS_INT16_FILL -998; ERR_INT16_FILL -995; VDNE_INT16_FILL -993	**Name** / **Value**

TradnadSolar — 2byte(s)

Name	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**
Solar	Yes	No	27	27

Datum

Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**	**Legend Entries**
Radiator	0			count	No		16-bit integer	**Name** / **Value**	**Name** / **Value**

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		Temperature at Nadir								NA_INT16_FILL MISS_INT16_FILL ERR_INT16_FILL VDNE_INT16_FILL	-999 -998 -995 -993	
Tel1nadSolar	2byte(s)	**Name** / **Granule Boundary** / **Dynamic** / **Min Array Size** / **Max Array Size** Solar / Yes / No / 27 / 27										
		Datum										
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**
		Electronics 1 Temperature at Nadir	0			count	No		16-bit integer	**Name** / **Value** NA_INT16_FILL / -999 MISS_INT16_FILL / -998 ERR_INT16_FILL / -995 VDNE_INT16_FILL / -993		**Name** / **Value**
Tel2nadSolar	2byte(s)	**Name** / **Granule Boundary** / **Dynamic** / **Min Array Size** / **Max Array Size** Solar / Yes / No / 27 / 27										
		Datum										
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**
		Electronics 2 Temperature at Nadir	0			count	No		16-bit integer	**Name** / **Value** NA_INT16_FILL / -999 MISS_INT16_FILL / -998 ERR_INT16_FILL / -995 VDNE_INT16_FILL / -993		**Name** / **Value**
PccdNPSolar	2byte(s)	**Name** / **Granule Boundary** / **Dynamic** / **Min Array Size** / **Max Array Size** Solar / Yes / No / 27 / 27										
		Datum										
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**
		Profile of CCD	0			count	No		16-bit integer	**Name** / **Value** NA_INT16_FILL / -999 MISS_INT16_FILL / -998		**Name** / **Value**

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											ERR_INT16_FILL	-995
											VDNE_INT16_FILL	-993

VtecNPSolar — 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Solar	Yes	No	27	27

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Voltage of Electronics	0			count	No		16-bit integer	NA_INT16_FILL	-999		
								MISS_INT16_FILL	-998		
								ERR_INT16_FILL	-995		
								VDNE_INT16_FILL	-993		

CtecNPSolar — 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Solar	Yes	No	27	27

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Electronics current	0			count	No		16-bit integer	NA_INT16_FILL	-999		
								MISS_INT16_FILL	-998		
								ERR_INT16_FILL	-995		
								VDNE_INT16_FILL	-993		

GonPar — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Solar	Yes	No	27	27
SpectralPixel	No	No	200	200
SpatialPixel	No	No	200	200

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Goniometric correction to solar counts	0		.	unitless	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		

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										ERR_FLOAT32_FILL	-999.5
										VDNE_FLOAT32_FILL	-999.3

FluxData — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Solar	Yes	No	27	27
SpectralPixel	No	No	364	364
SpatialPixel	No	No	200	200

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Final corrected solar counts of individual solar observation	0			W/cm^3	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

TccdNPDark — 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Dark	Yes	No	5	5

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
CCD Temperature	0			count	No		16-bit integer	NA_INT16_FILL	-999		
								MISS_INT16_FILL	-998		
								ERR_INT16_FILL	-995		
								VDNE_INT16_FILL	-993		

TmotnadDark — 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Dark	Yes	No	5	5

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Motor Temperature at Nadir	0			count	No		16-bit integer	NA_INT16_FILL	-999		
								MISS_INT16_FILL	-998		

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											ERR_INT16_FILL	-995
											VDNE_INT16_FILL	-993

TImpnadDark — 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Dark	Yes	No	5	5

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Lamp Temperature at Nadir	0			count	No		16-bit integer	NA_INT16_FILL	-999		
								MISS_INT16_FILL	-998		
								ERR_INT16_FILL	-995		
								VDNE_INT16_FILL	-993		

TradnadDark — 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Dark	Yes	No	5	5

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Radiator Temperature at Nadir	0			count	No		16-bit integer	NA_INT16_FILL	-999		
								MISS_INT16_FILL	-998		
								ERR_INT16_FILL	-995		
								VDNE_INT16_FILL	-993		

Tel1nadDark — 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Dark	Yes	No	5	5

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Electronics 1 Temperature at Nadir	0			count	No		16-bit integer	NA_INT16_FILL	-999		
								MISS_INT16_FILL	-998		
								ERR_INT16_FILL	-995		
								VDNE_INT16_FILL	-993		

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Tel2nadDark	2byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**									
		Dark	Yes	No	5	5									
		Datum													
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**			
		Electronics 2 Temperature at Nadir	0			count	No		16-bit integer	**Name**	**Value**	**Name**	**Value**		
										NA_INT16_FILL	-999				
										MISS_INT16_FILL	-998				
										ERR_INT16_FILL	-995				
										VDNE_INT16_FILL	-993				
PccdNPDark	2byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**									
		Dark	Yes	No	5	5									
		Datum													
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**			
		Profile of CCD	0			count	No		16-bit integer	**Name**	**Value**	**Name**	**Value**		
										NA_INT16_FILL	-999				
										MISS_INT16_FILL	-998				
										ERR_INT16_FILL	-995				
										VDNE_INT16_FILL	-993				
VtecNPDark	2byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**									
		Dark	Yes	No	5	5									
		Datum													
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**			
		Voltage of Electronics	0			count	No		16-bit integer	**Name**	**Value**	**Name**	**Value**		
										NA_INT16_FILL	-999				
										MISS_INT16_FILL	-998				
										ERR_INT16_FILL	-995				
										VDNE_INT16_FILL	-993				
CtecNPDark	2byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**									
		Dark	Yes	No	5	5									

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		Datum										
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Current of Electronics	0			count	No		16-bit integer	**Name**	**Value**	**Name**	**Value**
										NA_INT16_FILL	-999		
										MISS_INT16_FILL	-998		
										ERR_INT16_FILL	-995		
										VDNE_INT16_FILL	-993		

DarkArray	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**
		Dark	No	No	5	5
		SpectralPixel	No	No	364	364
		SpatialPixel	Yes	No	390	390

Datum												
Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
Correct counts of an individual dark current image.	0			count	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

TccdNPLamp	2byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**
		Lamp	Yes	No	150	150

Datum												
Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
CCD Temperature	0			count	No		16-bit integer	**Name**	**Value**	**Name**	**Value**
								NA_INT16_FILL	-999		
								MISS_INT16_FILL	-998		
								ERR_INT16_FILL	-995		
								VDNE_INT16_FILL	-993		

TmotnadLamp	2byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**
		Lamp	Yes	No	150	150

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		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Motor Temperature at Nadir	0			count	No		16-bit integer	**Name**	**Value**	**Name**	**Value**
										NA_INT16_FILL	-999		
										MISS_INT16_FILL	-998		
										ERR_INT16_FILL	-995		
										VDNE_INT16_FILL	-993		
TImpnadLamp	2byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**							
		Lamp	Yes	No	150	150							
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Lamp Temperature at Nadir	0			count	No		16-bit integer	**Name**	**Value**	**Name**	**Value**
										NA_INT16_FILL	-999		
										MISS_INT16_FILL	-998		
										ERR_INT16_FILL	-995		
										VDNE_INT16_FILL	-993		
TradnadLamp	2byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**							
		Lamp	Yes	No	150	150							
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Radiator Temperature at Nadir	0			count	No		16-bit integer	**Name**	**Value**	**Name**	**Value**
										NA_INT16_FILL	-999		
										MISS_INT16_FILL	-998		
										ERR_INT16_FILL	-995		
										VDNE_INT16_FILL	-993		
Tel1nadLamp	2byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**							
		Lamp	Yes	No	150	150							
		Datum											
		Description	**Datum**	**Unscaled**	**Unscaled**	**Measurement**	**Scaled**	**Scale**	**Data Type**	**Fill Values**		**Legend**	

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			Offset	Valid Range Min	Valid Range Max	Units		Factor Name			Entries
		Electronics 1 Temperature at Nadir	0			count	No		16-bit integer	Name: NA_INT16_FILL, Value: -999 Name: MISS_INT16_FILL, Value: -998 Name: ERR_INT16_FILL, Value: -995 Name: VDNE_INT16_FILL, Value: -993	Name, Value

		Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Tel2nadLamp	2byte(s)	Lamp	Yes	No	150	150

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Electronics 2 Temperature at Nadir	0			count	No		16-bit integer	Name: NA_INT16_FILL, Value: -999 Name: MISS_INT16_FILL, Value: -998 Name: ERR_INT16_FILL, Value: -995 Name: VDNE_INT16_FILL, Value: -993	Name, Value

		Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
PccdNPLamp	2byte(s)	Lamp	Yes	No	150	150

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Profile of CCD	0			count	No		16-bit integer	Name: NA_INT16_FILL, Value: -999 Name: MISS_INT16_FILL, Value: -998 Name: ERR_INT16_FILL, Value: -995 Name: VDNE_INT16_FILL, Value: -993	Name, Value

		Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
VtecNPLamp	2byte(s)	Lamp	Yes	No	150	150

Datum

Description	Datum Offset	Unscaled Valid Range	Unscaled Valid Range	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries

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				Min	**Max**						
		Voltage of Electronics	0			count	No		16-bit integer	**Name** / **Value**: NA_INT16_FILL -999; MISS_INT16_FILL -998; ERR_INT16_FILL -995; VDNE_INT16_FILL -993	**Name** / **Value**

CtecNPLamp — 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Lamp	Yes	No	150	150

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Electronics current	0			count	No		16-bit integer	**Name** / **Value**: NA_INT16_FILL -999; MISS_INT16_FILL -998; ERR_INT16_FILL -995; VDNE_INT16_FILL -993	**Name** / **Value**

LampData — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Lamp	Yes	No	150	150
SpectralPixel	No	No	364	364
SpatialPixel	No	No	390	390

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Correct counts of an individual lamp image	0			count	No		32-bit floating point	**Name** / **Value**: NA_FLOAT32_FILL -999.9; MISS_FLOAT32_FILL -999.8; ERR_FLOAT32_FILL -999.5; VDNE_FLOAT32_FILL -999.3	**Name** / **Value**

QualityLamp — 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Lamp	Yes	No	150	150

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries

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		Reliability of lamp processing	0			unitless	No		16-bit integer	**Name**	**Value**	**Name**	**Value**
										NA_INT16_FILL	-999		
										MISS_INT16_FILL	-998		
										ERR_INT16_FILL	-995		
										VDNE_INT16_FILL	-993		

QualitySolar	2byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**							
		Solar	Yes	No	27	27							
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Reliability of solar processing	0			unitless	No		16-bit integer	**Name**	**Value**	**Name**	**Value**
										NA_INT16_FILL	-999		
										MISS_INT16_FILL	-998		
										ERR_INT16_FILL	-995		
										VDNE_INT16_FILL	-993		

QualityDark	2byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**							
		Dark	Yes	No	5	5							
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Reliability of dark processing	0			unitless	No		16-bit integer	**Name**	**Value**	**Name**	**Value**
										NA_INT16_FILL	-999		
										MISS_INT16_FILL	-998		
										ERR_INT16_FILL	-995		
										VDNE_INT16_FILL	-993		

MedianDark	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**							
		Granule	Yes	No	1	1							
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Median dark current	0			count	No		32-bit floating	**Name**	**Value**	**Name**	**Value**
										NA_FLOAT32_FILL	-999.9		

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									point	MISS_FLOAT32_FILL	-999.8	
										ERR_FLOAT32_FILL	-999.5	
										VDNE_FLOAT32_FILL	-999.3	

Fitness — 8byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
IFOV	Yes	No	5	5

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Chi-squared goodness of fit for wavelengths	0			unitless	No		64-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT64_FILL	-999.9		
								MISS_FLOAT64_FILL	-999.8		
								ERR_FLOAT64_FILL	-999.5		
								VDNE_FLOAT64_FILL	-999.3		

CompleteFlag — 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	1	1

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Completeness of solar calibration data	0			unitless	No		16-bit integer	**Name**	**Value**	**Name**	**Value**
								NA_INT16_FILL	-999		
								MISS_INT16_FILL	-998		
								ERR_INT16_FILL	-995		
								VDNE_INT16_FILL	-993		

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Table 2.9.2.2-2, OMPS NP Calibration SDR Product Profile – Quality Values

SAALamp	1byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**					
		Lamp	Yes	No	150	150					
		Datum									
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**	**Legend Entries**
		Spacecraft within South Atlantic Anomaly during lamp calibration (extent in percent based on Climatological data)	0			unitless	No		unsigned 8-bit char	**Name** / **Value**	**Name** / **Value**: 0% <= SAA <= 10% 0; 10% < SAA <= 20% 1; 20% < SAA <= 30% 2; 30% < SAA <= 40% 3; 40% < SAA <= 50% 4; 50% < SAA <= 60% 5; 60% < SAA <= 70% 6; 70% < SAA <= 80% 7; 80% < SAA 8
SAASolar	1byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**					
		Solar	Yes	No	27	27					
		Datum									
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**	**Legend Entries**
		Spacecraft within South Atlantic Anomaly during solar calibration (extent in percent based on Climatological data)	0			unitless	No		unsigned 8-bit char	**Name** / **Value**	**Name** / **Value**: 0% <= SAA <= 10% 0; 10% < SAA <= 20% 1; 20% < SAA <= 30% 2; 30% < SAA <= 40% 3; 40% < SAA <= 50% 4; 50% < SAA <= 60% 5; 60% < SAA <= 70% 6; 70% < SAA <= 80% 7; 80% < SAA 8
SAADark	1byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**					
		Dark	Yes	No	5	5					
		Datum									

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		Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
		Spacecraft within South Atlantic Anomaly during dark calibration (extent in percent based on Climatological data)	0			unitless	No		unsigned 8-bit char	Name Value	Name Value 0% <= SAA <= 10% 0 10% < SAA <= 20% 1 20% < SAA <= 30% 2 30% < SAA <= 40% 3 40% < SAA <= 50% 4 50% < SAA <= 60% 5 60% < SAA <= 70% 6 70% < SAA <= 80% 7 80% < SAA 8

		Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Eclipse	1byte(s)	Solar	Yes	No	27	27

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Eclipse - All or part of the S/C is affected by a solar eclipse, umbra or penumbra viewing.	0			unitless	No		unsigned 8-bit char	Name Value	Name Value False 0 True 1

		Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
OccultationFlag	1byte(s)	Solar	Yes	No	27	27

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Occultation of the diffuser has occurred during solar	0			unitless	No		unsigned 8-bit char	Name Value	Name Value False 0 True 1

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		observation										

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2.9.2.3 OMPS NP Calibration SDR HDF5 Details

Figure 2.9.2.3-1, OMPS NP Calibration SDR UML Diagram, provides the details on the content and data types of the OMPS NP Calibration SDR. These UML diagrams provide details at the granule level only. In addition to these UML diagrams, refer to Section 2.2, Sensor Data Records and Temperature Data Records HDF5 Details, Figure 2.2-1, Generalized UML Diagram for HDF5 SDR/TDR Files, for a complete UML rendering of this product.

The OMPS NP Calibration SDR within the HDF5 files can be found within the Data Products group with the group name of OMPS-NP-Cal-SDR. The aggregation and granule(s) contain the data fields listed in the UML diagrams. The corresponding HDF5 data type for each field is also provided.

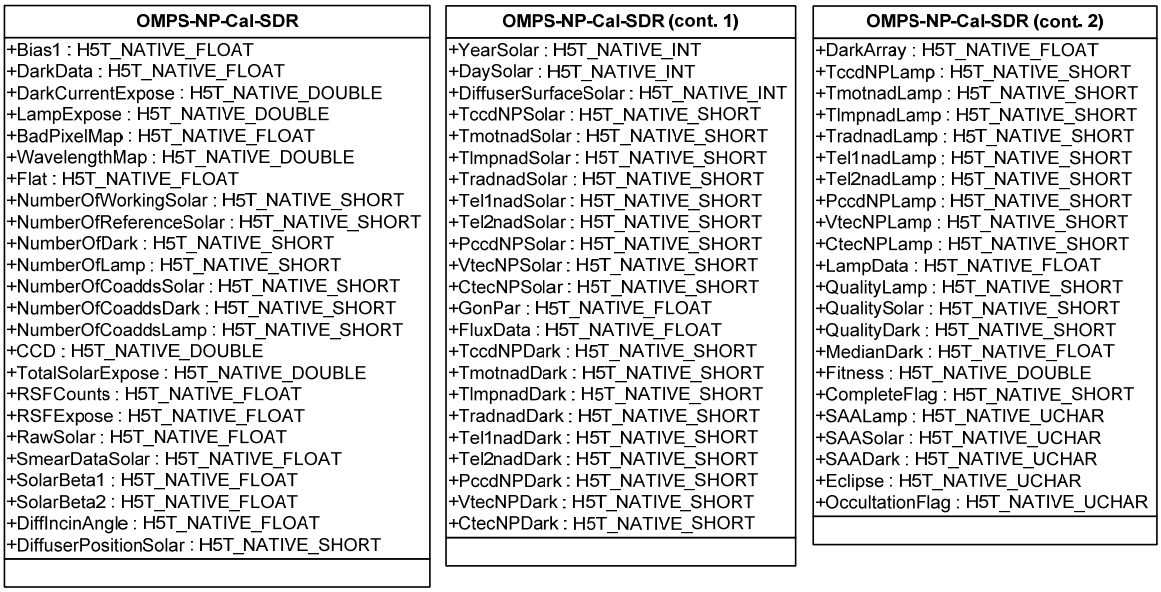

Figure 2.9.2.3-1, OMPS NP Calibration SDR UML Diagram

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2.9.2.4 OMPS NP Calibration SDR Metadata Details

The HDF5 metadata elements associated with the OMPS NP Calibration SDR are listed in the CDFCB-X Volume V, Section 4.3, HDF5 (Metadata) Hierarchy. The OMPS NP Calibration SDR metadata includes all common metadata at the root, product, aggregation, and granule levels. No summary level metadata is produced for OMPS NP Calibration SDRs.

2.9.2.5 OMPS NP Calibration SDR Geolocation Content Summary

The OMPS NP calibration SDR geolocation datasets are summarized below in table 2.9.2.5-1 OMPS NP Calibration SDR Geolocation Content Summary.

Table 2.9.2.5-1, OMPS NP Calibration SDR Geolocation Content Summary

Name	Description	Data Type	Aggregate Dimensions	Granule Dimensions	Units
StartTime_Solar	Start time of solar frame in IET (1/1/1958)	64-bit integer	[N*27]	[27]	microsecond
MidTime_Solar	Mid-Time of solar frame in IET (1/1/1958)	64-bit integer	[N*27]	[27]	microsecond
EndTime_Solar	End time of solar frame in IET (1/1/1958)	64-bit integer	[N*27]	[27]	microsecond
Latitude_Solar	Sub-Satellite Latitude (positive North) at midTime_Solar	32-bit floating point	[N*27, 1]	[27, 1]	degree
Longitude_Solar	Sub-Satellite Longitude (positive East) at MidTime_Solar	32-bit floating point	[N*27, 1]	[27, 1]	degree
MoonVector_Solar	Lunar Position in Spacecraft Coordinates at MidTime_Solar	32-bit floating point	[N*27, 3]	[27, 3]	meter
SunVector_Solar	Solar position in Spacecraft Coordinate System at MidTime_Solar	32-bit floating point	[N*27, 3]	[27, 3]	meter

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Name	Description	Data Type	Aggregate Dimensions	Granule Dimensions	Units
SCPosition_Solar	Spacecraft position in ECR Coordinates (X, Y, Z) at MidTime_Solar	32-bit floating point	[N*27, 3]	[27, 3]	meter
SCVelocity_Solar	Spacecraft velocity in ECR Coordinates (dx/dt, dy/dt, dz/dt) at MidTime_Solar	32-bit floating point	[N*27, 3]	[27, 3]	m/s
SCAttitude_Solar	Spacecraft attitude with respect to Geodetic Reference Frame Coordinates (roll, pitch, yaw) at MidTime_Solar	32-bit floating point	[N*27, 3]	[27, 3]	arcsecond
StartTime_Dark	Start time of dark frame in IET (1/1/1958)	64-bit integer	[N*5]	[5]	microsecond
MidTime_Dark	Mid-Time of dark frame in IET (1/1/1958)	64-bit integer	[N*5]	[5]	microsecond
EndTime_Dark	End time of dark frame in IET (1/1/1958)	64-bit integer	[N*5]	[5]	microsecond
Latitude_Dark	Sub-Satellite Latitude (positive North) at MidTime_Dark	32-bit floating point	[N*5, 1]	[5, 1]	degree
Longitude_Dark	Sub-Satellite Longitude (positive East) at MidTime_Dark	32-bit floating point	[N*5, 1]	[5, 1]	degree
SCPosition_Dark	Spacecraft position in ECR Coordinates (X, Y, Z) at MidTime_Dark	32-bit floating point	[N*5, 3]	[5, 3]	meter
SCVelocity_Dark	Spacecraft velocity in ECR Coordinates (dx/dt, dy/dt, dz/dt) at MidTime_Dark	32-bit floating point	[N*5, 3]	[5, 3]	m/s

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Name	Description	Data Type	Aggregate Dimensions	Granule Dimensions	Units
SCAttitude_Dark	Spacecraft attitude with respect to Geodetic Reference Frame Coordinates (roll, pitch, yaw) at MidTime_Dark	32-bit floating point	[N*5, 3]	[5, 3]	arcsecond
StartTime_Lamp	Start time of lamp frame in IET (1/1/1958)	64-bit integer	[N*150]	[150]	microsecond
MidTime_Lamp	Mid-Time of lamp frame in IET (1/1/1958)	64-bit integer	[N*150]	[150]	microsecond
EndTime_Lamp	End time of lamp frame in IET (1/1/1958)	64-bit integer	[N*150]	[150]	microsecond
Latitude_Lamp	Sub-Satellite Latitude (positive North) at MidTime_Lamp	32-bit floating point	[N*150, 1]	[150, 1]	degree
Longitude_Lamp	Sub-Satellite Longitude (positive East) at MidTime_Lamp	32-bit floating point	[N*150, 1]	[150, 1]	degree
SCPosition_Lamp	Spacecraft position in ECR Coordinates (X, Y, Z) at MidTime_Lamp	32-bit floating point	[N*150, 3]	[150, 3]	meter
SCVelocity_Lamp	Spacecraft velocity in ECR Coordinates (dx/dt, dy/dt, dz/dt) at MidTime_Lamp	32-bit floating point	[N*150, 3]	[150, 3]	m/s
SCAttitude_Lamp	Spacecraft attitude with respect to Geodetic Reference Frame Coordinates (roll, pitch, yaw) at MidTime_Lamp	32-bit floating point	[N*150, 3]	[150, 3]	arcsecond
NumberOfSolar	Actual number of solar frames (images)	16-bit integer	[N]	[1]	unitless
NumberOfDark	Actual number of dark frames (images)	16-bit integer	[N]	[1]	unitless

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Name	Description	Data Type	Aggregate Dimensions	Granule Dimensions	Units
NumberOfLamp	Actual number of lamp frames (images)	16-bit integer	[N]	[1]	unitless
QF1_GEOSOLAR	Attitude/Ephemeris availability status during Solar Calibration	unsigned 8-bit char	[N*27]	[27]	unitless
QF2_GEODARK	Attitude/Ephemeris availability status during Dark Calibration	unsigned 8-bit char	[N*5]	[5]	unitless
QF3_GEOLAMP	Attitude/Ephemeris availability status during Lamp Calibration	unsigned 8-bit char	[N*150]	[150]	unitless

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2.9.2.6 OMPS NP Calibration SDR Geolocation Product Profile

Table 2.9.2.6-1, OMPS NP Calibration SDR Geolocation Product Profile

Fields																
Name	**Data Size**	**Dimensions**														
StartTime_Solar	8byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**										
		Solar	Yes	No	27	27										
		Datum														
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**				
		Start time of solar frame in IET (1/1/1958)	0			microsecond	No		64-bit integer	**Name**	**Value**	**Name**	**Value**			
										NA_INT64_FILL	-999					
										MISS_INT64_FILL	-998					
										ERR_INT64_FILL	-995					
										VDNE_INT64_FILL	-993					
MidTime_Solar	8byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**										
		Solar	Yes	No	27	27										
		Datum														
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**				
		Mid-Time of solar frame in IET (1/1/1958)	0			microsecond	No		64-bit integer	**Name**	**Value**	**Name**	**Value**			
										NA_INT64_FILL	-999					
										MISS_INT64_FILL	-998					
										ERR_INT64_FILL	-995					
										VDNE_INT64_FILL	-993					
EndTime_Solar	8byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**										
		Solar	Yes	No	27	27										
		Datum														
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**				

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		End time of solar frame in IET (1/1/1958)	0			microsecond	No		64-bit integer	**Name**	**Value**	**Name**	**Value**
										NA_INT64_FILL	-999		
										MISS_INT64_FILL	-998		
										ERR_INT64_FILL	-995		
										VDNE_INT64_FILL	-993		

Latitude_Solar — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Solar	Yes	No	27	27
SpatialPixel	No	No	1	1

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Sub-Satellite Latitude (positive North) at MidTime_Solar	0	-90	90	degree	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

Longitude_Solar — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Solar	Yes	No	27	27
SpatialPixel	No	No	1	1

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Sub-Satellite Longitude (positive East) at MidTime_Solar	0	-180	180	degree	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

MoonVector_Solar — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Solar	Yes	No	27	27
SCCoordinate	No	No	3	3

Datum

Description	Datum Offset	Unscaled Valid Range	Unscaled Valid Range	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries

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				Min	Max							
		Lunar Position in Spacecraft Coordinates at MidTime_Solar	0			meter	No		32-bit floating point	Name / Value NA_FLOAT32_FILL / -999.9 MISS_FLOAT32_FILL / -999.8 ERR_FLOAT32_FILL / -999.5 VDNE_FLOAT32_FILL / -999.3	Name / Value	

SunVector_Solar — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Solar	Yes	No	27	27
SCCoordinate	No	No	3	3

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Solar position in Spacecraft Coordinate System at MidTime_Solar	0			meter	No		32-bit floating point	Name / Value NA_FLOAT32_FILL / -999.9 MISS_FLOAT32_FILL / -999.8 ERR_FLOAT32_FILL / -999.5 VDNE_FLOAT32_FILL / -999.3	Name / Value

SCPosition_Solar — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Solar	Yes	No	27	27
ECRCoordinate	No	No	3	3

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Spacecraft position in ECR Coordinates (X, Y, Z) at MidTime_Solar	0			meter	No		32-bit floating point	Name / Value NA_FLOAT32_FILL / -999.9 MISS_FLOAT32_FILL / -999.8 ERR_FLOAT32_FILL / -999.5 VDNE_FLOAT32_FILL / -999.3	Name / Value

SCVelocity_Solar — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Solar	Yes	No	27	27
ECRCoordinate	No	No	3	3

Datum

Description	Datum Offset	Unscaled Valid	Unscaled Valid	Measurement Units	Scaled	Scale Factor	Data Type	Fill Values	Legend Entries

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				Range Min	Range Max			Name				
		Spacecraft velocity in ECR Coordinates (dx/dt, dy/dt, dz/dt) at MidTime_Solar	0			m/s	No		32-bit floating point	Name: NA_FLOAT32_FILL, Value: -999.9 Name: MISS_FLOAT32_FILL, Value: -999.8 Name: ERR_FLOAT32_FILL, Value: -999.5 Name: VDNE_FLOAT32_FILL, Value: -999.3	Name	Value

SCAttitude_Solar — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Solar	Yes	No	27	27
GRFCoordinate	No	No	3	3

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Spacecraft attitude with respect to Geodetic Reference Frame Coordinates (roll, pitch, yaw) at MidTime_Solar	0			arcsecond	No		32-bit floating point	Name: NA_FLOAT32_FILL, Value: -999.9 Name: MISS_FLOAT32_FILL, Value: -999.8 Name: ERR_FLOAT32_FILL, Value: -999.5 Name: VDNE_FLOAT32_FILL, Value: -999.3	Name, Value

StartTime_Dark — 8byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Dark	Yes	No	5	5

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Start time of dark frame in IET (1/1/1958)	0			microsecond	No		64-bit integer	Name: NA_INT64_FILL, Value: -999 Name: MISS_INT64_FILL, Value: -998 Name: ERR_INT64_FILL, Value: -995 Name: VDNE_INT64_FILL, Value: -993	Name, Value

MidTime_Dark — 8byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Dark	Yes	No	5	5

Datum

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		Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
		Mid -Time of dark frame in IET (1/1/1958)	0			microsecond	No		64-bit integer	**Name**	**Value**	**Name**	**Value**
										NA_INT64_FILL	-999		
										MISS_INT64_FILL	-998		
										ERR_INT64_FILL	-995		
										VDNE_INT64_FILL	-993		

		Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
EndTime_Dark	8byte(s)	Dark	Yes	No	5	5

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
End time of dark frame in IET (1/1/1958)	0			microsecond	No		64-bit integer	**Name**	**Value**	**Name**	**Value**
								NA_INT64_FILL	-999		
								MISS_INT64_FILL	-998		
								ERR_INT64_FILL	-995		
								VDNE_INT64_FILL	-993		

		Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Latitude_Dark	4byte(s)	Dark	Yes	No	5	5
		SpatialPixel	No	No	1	1

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Sub-Satellite Latitude (positive North) at MidTime_Dark	0	-90	90	degree	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

		Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Longitude_Dark	4byte(s)	Dark	Yes	No	5	5
		SpatialPixel	No	No	1	1

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries

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		Sub-Satellite Longitude (positive East) at MidTime_Dark	0	-180	180	degree	No		32-bit floating point	**Name** / **Value**: NA_FLOAT32_FILL -999.9; MISS_FLOAT32_FILL -999.8; ERR_FLOAT32_FILL -999.5; VDNE_FLOAT32_FILL -999.3	**Name** / **Value**		

SCPosition_Dark — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Dark	Yes	No	5	5
ECRCoordinate	No	No	3	3

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Spacecraft position in ECR Coordinates (X, Y, Z) at MidTime_Dark	0			meter	No		32-bit floating point	**Name** / **Value**: NA_FLOAT32_FILL -999.9; MISS_FLOAT32_FILL -999.8; ERR_FLOAT32_FILL -999.5; VDNE_FLOAT32_FILL -999.3	**Name** / **Value**

SCVelocity_Dark — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Dark	Yes	No	5	5
ECRCoordinate	No	No	3	3

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Spacecraft velocity in ECR Coordinates (dx/dt, dy/dt, dz/dt) at MidTime_Dark	0			m/s	No		32-bit floating point	**Name** / **Value**: NA_FLOAT32_FILL -999.9; MISS_FLOAT32_FILL -999.8; ERR_FLOAT32_FILL -999.5; VDNE_FLOAT32_FILL -999.3	**Name** / **Value**

SCAttitude_Dark — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Dark	Yes	No	5	5
GRFCoordinate	No	No	3	3

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries

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		Spacecraft attitude with respect to Geodetic Reference Frame Coordinates (roll, pitch, yaw) at MidTime_Dark	0			arcsecond	No		32-bit floating point	**Name** / **Value**: NA_FLOAT32_FILL -999.9; MISS_FLOAT32_FILL -999.8; ERR_FLOAT32_FILL -999.5; VDNE_FLOAT32_FILL -999.3	**Name** / **Value**	

StartTime_Lamp — 8byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Lamp	Yes	No	150	150

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Start time of lamp frame in IET (1/1/1958)	0			microsecond	No		64-bit integer	**Name** / **Value**: NA_INT64_FILL -999; MISS_INT64_FILL -998; ERR_INT64_FILL -995; VDNE_INT64_FILL -993	**Name** / **Value**

MidTime_Lamp — 8byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Lamp	Yes	No	150	150

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Mid-Time of lamp frame in IET (1/1/1958)	0			microsecond	No		64-bit integer	**Name** / **Value**: NA_INT64_FILL -999; MISS_INT64_FILL -998; ERR_INT64_FILL -995; VDNE_INT64_FILL -993	**Name** / **Value**

EndTime_Lamp — 8byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Lamp	Yes	No	150	150

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
End time of lamp frame in IET (1/1/1958)	0			microsecond	No		64-bit integer	**Name** / **Value**: NA_INT64_FILL -999	**Name** / **Value**

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										MISS_INT64_FILL	-998	
										ERR_INT64_FILL	-995	
										VDNE_INT64_FILL	-993	

Latitude_Lamp — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Lamp	Yes	No	150	150
SpatialPixel	No	No	1	1

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Sub-Satellite Latitude (positive North) at MidTime_Lamp	0	-90	90	degree	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

Longitude_Lamp — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Lamp	Yes	No	150	150
SpatialPixel	No	No	1	1

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Sub-Satellite Longitude (positive East) at MidTIme_Lamp	0	-180	180	degree	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

SCPosition_Lamp — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Lamp	Yes	No	150	150
ECRCoordinate	No	No	3	3

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Spacecraft position in ECR	0			meter	No		32-bit floating	NA_FLOAT32_FILL	-999.9		

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		Coordinates (X, Y, Z) at MidTime_Lamp							point	MISS_FLOAT32_FILL ERR_FLOAT32_FILL VDNE_FLOAT32_FILL	-999.8 -999.5 -999.3	

SCVelocity_Lamp — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Lamp	Yes	No	150	150
ECRCoordinate	No	No	3	3

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Spacecraft velocity in ECR Coordinates (dx/dt, dy/dt, dz/dt) at MidTime_Lamp	0			m/s	No		32-bit floating point	NA_FLOAT32_FILL MISS_FLOAT32_FILL ERR_FLOAT32_FILL VDNE_FLOAT32_FILL	-999.9 -999.8 -999.5 -999.3		

SCAttitude_Lamp — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Lamp	Yes	No	150	150
GRFCoordinate	No	No	3	3

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Spacecraft attitude with respect to Geodetic Reference Frame Coordinates (roll, pitch, yaw) at MidTime_Lamp	0			arcsecond	No		32-bit floating point	NA_FLOAT32_FILL MISS_FLOAT32_FILL ERR_FLOAT32_FILL VDNE_FLOAT32_FILL	-999.9 -999.8 -999.5 -999.3		

NumberOfSolar — 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	1	1

Datum

Description	Datum Offset	Unscaled Valid	Unscaled Valid	Measurement Units	Scaled	Scale Factor	Data Type	Fill Values	Legend Entries

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				Range Min	Range Max			Name			
		Actual number of solar frames (images)	0			unitless	No		16-bit integer	**Name** / **Value** NA_INT16_FILL / -999 MISS_INT16_FILL / -998 ERR_INT16_FILL / -995 VDNE_INT16_FILL / -993	**Name** / **Value**

NumberOfDark — 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	1	1

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Actual number of dark frames (images)	0			unitless	No		16-bit integer	**Name** / **Value** NA_INT16_FILL / -999 MISS_INT16_FILL / -998 ERR_INT16_FILL / -995 VDNE_INT16_FILL / -993	**Name** / **Value**

NumberOfLamp — 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	1	1

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Actual number of lamp frames (images)	0			unitless	No		16-bit integer	**Name** / **Value** NA_INT16_FILL / -999 MISS_INT16_FILL / -998 ERR_INT16_FILL / -995 VDNE_INT16_FILL / -993	**Name** / **Value**

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Table 2.9.2.6-2, OMPS NP Calibration SDR Geolocation Product Profile – Quality Flags

Fields

Name	Data Size	Dimensions
QF1_GEOSOLAR	1byte(s)	
QF2_GEODARK	1byte(s)	

QF1_GEOSOLAR – Dimensions

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Solar	Yes	No	27	27

QF1_GEOSOLAR – Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values (Name / Value)	Legend Entries (Name / Value)
Attitude and Ephemeris availability status	0			unitless	No		2 bit(s)		Nominal - E&A data available: 0 Missing Data <= Small Gap: 1 Small Gap < Missing Data < Granule Boundary: 2 Missing Data >= Granule Boundary: 3
Spare	2			unitless	No		6 bit(s)		

QF2_GEODARK – Dimensions

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Dark	Yes	No	5	5

QF2_GEODARK – Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values (Name / Value)	Legend Entries (Name / Value)
Attitude and Ephemeris availability status	0			unitless	No		2 bit(s)		Nominal - E&A data available: 0 Missing Data <= Small Gap: 1 Small Gap < Missing Data < Granule Boundary: 2

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											Missing Data >= Granule Boundary	3
		Spare	2			unitless	No		6 bit(s)	**Name** **Value**	**Name** **Value**	

QF3_GEOLAMP — 1byte(s)

Name	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**
Lamp	Yes	No	150	150

Datum

Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**	**Legend Entries**	
Attitude and Ephemeris availability status	0			unitless	No		2 bit(s)	**Name** **Value**	**Name**	**Value**
									Nominal - E&A data available	0
									Missing Data <= Small Gap	1
									Small Gap < Missing Data < Granule Boundary	2
									Missing Data >= Granule Boundary	3
Spare	2			unitless	No		6 bit(s)	**Name** **Value**	**Name** **Value**	

2.9.2.7 OMPS NP Calibration SDR Geolocation HDF5 Details

The OMPS NP Calibration SDR Geolocation is based on a simple spatial average over the geometric cell bounds, regardless of pixel sampling. Geolocation is reported on the ellipsoid. Figure 2.9.2.7-1, OMPS NP Calibration SDR Geolocation UML Diagram, provides details on the contents and data types of the OMPS NP SDR geolocation.

OMPS-NP-Cal-GEO
+StartTime_Solar : H5T_NATIVE_LLONG +MidTime_Solar : H5T_NATIVE_LLONG +EndTime_Solar : H5T_NATIVE_LLONG +Latitude_Solar : H5T_NATIVE_FLOAT +Longitude_Solar : H5T_NATIVE_FLOAT +MoonVector_Solar : H5T_NATIVE_FLOAT +SunVector_Solar : H5T_NATIVE_FLOAT +SCPosition_Solar : H5T_NATIVE_FLOAT +SCVelocity_Solar : H5T_NATIVE_FLOAT +SCAttitude_Solar : H5T_NATIVE_FLOAT +StartTime_Dark : H5T_NATIVE_LLONG +MidTime_Dark : H5T_NATIVE_LLONG +EndTime_Dark : H5T_NATIVE_LLONG +Latitude_Dark : H5T_NATIVE_FLOAT +Longitude_Dark : H5T_NATIVE_FLOAT +SCPosition_Dark : H5T_NATIVE_FLOAT +SCVelocity_Dark : H5T_NATIVE_FLOAT +SCAttitude_Dark : H5T_NATIVE_FLOAT +StartTime_Lamp : H5T_NATIVE_LLONG +MidTime_Lamp : H5T_NATIVE_LLONG +EndTime_Lamp : H5T_NATIVE_LLONG +Latitude_Lamp : H5T_NATIVE_FLOAT +Longitude_Lamp : H5T_NATIVE_FLOAT +SCPosition_Lamp : H5T_NATIVE_FLOAT +SCVelocity_Lamp : H5T_NATIVE_FLOAT +SCAttitude_Lamp : H5T_NATIVE_FLOAT +NumberOfSolar : H5T_NATIVE_SHORT +NumbrOfDark : H5T_NATIVE_SHORT +NumberOfLamp : H5T_NATIVE_SHORT +QF1_GEOSOLAR : H5T_NATIVE_UCHAR +QF2_GEODARK : H5T_NATIVE_UCHAR +QF3_GEOLAMP : H5T_NATIVE_UCHAR

Figure 2.9.2.7-1, OMPS NP Calibration SDR Geolocation UML Diagram

2.9.2.8 OMPS NP Calibration SDR Geolocation Metadata Details

The HDF5 metadata elements associated with the OMPS NP Calibration SDR Geolocation are listed in the CDFCB-X Volume V, Section 4.3, HDF5 (Metadata) Hierarchy. There are no additional metadata elements or granule level quality flags for this geolocation.

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2.10 OMPS Total Column SDRs

Data Mnemonic	SDRE-OMTC-C0030 Total Column (Science) SDRE-OMTC-C0031 Calibration GEOE-OMTC-C0030 Geolocation - ellipsoid
Description/ Purpose	The OMPS raw sensor data is decommutated, corrected, and calibrated by the SDR software and then stored in the Total Column (TC) SDR product. In addition to the data needed to support EDR generation, the TC SDR includes a number of other parameters described in more detail in Section 2.10.1. In addition to the production of the TC SDR, the generation of special Calibration SDRs supports the on-going, continuous calibration of the TC sensor. The Calibration SDR is described in Section 2.10.2. The OMPS nadir sensor uses a wide field-of-view push-broom telescope to feed two separate spectrometers. The nadir total column spectrometer measures the scene radiance between approximately 300 and 380 nanometers (nm) with a resolution of 1 nm sampled at 0.42 nm. In the parameters described below certain array dimensions are sized to a maximum expected value to allow some flexibility in sensor and algorithm configuration. For example, the actual number of Integrated Field of Views (IFOVs), Swaths, and SpectralPixels could change based on the configuration. In the case where actual data does not complete the array, fill values (Does Not Exist) are used. For these three dimensions, parameters available in the product indicate the number of actual values to be interpreted. Example geospatial coverage: The cross -track pixels are binned into 35 equal angle Integrated Field of Views (IFOV). The IFOV for the nadir cell of the total column measurement is ~46 km cross-track with an along-track reporting interval of 50 km. The 50km along-track interval is a result of the pixel extent combined with the spacecraft motion during the 7.5 second integration time. The OMPS TC SDR is used in the generation of the Ozone EDR/IPs.
File-Naming Construct	See the CDFCB-X Volume I, D34862-01, Section 3.0 for details.
File Size	Science: 2176.17. KiB Science Geolocation: 105.72 KiB Calibration: 216800.47 KiB

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	Calibration Geolocation: 1274.78 KiB Sizes are for a single granule without HDF5 overhead.
File Format Type	HDF5
Data Content and Data Format	The TC SDR format is described in Section 2.10.1, OMPS TC SDR Format, and the TC Calibration SDR format is described in Section 2.10.2, OMPS TC Calibration SDR Format.

2.10.1 OMPS TC SDR Format

The OMPS TC SDR format is described in the following subparagraphs.

2.10.1.1 OMPS TC SDR Data Content Summary

The OMPS TC SDR product structure contains the data arrays shown below in Table 2.10.1.1-1, OMPS TC SDR Data Content Summary.

Table 2.10.1.1-1, OMPS TC SDR Data Content Summary

Name	Description	Data Type	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
SmearDataEarth	Raw smear counts of Earth image	32-bit floating point	[N*15, 2, 260]	[15, 2, 260]	count
RadianceEarth	Calibrated Earth View Radiances	32-bit floating point	[N*15, 105, 260]	[15, 105, 260]	W/(cm^3•sr)
Wavelengths	Wavelengths used in SDR processing (wref)	64-bit floating point	[N*105, 260]	[105, 260]	nanometer
SolarFlux	Reference solar flux from calibration database (rsf_piece)	32-bit floating point	[N*105, 260]	[105, 260]	W/cm^3
Bias1	Average electronics bias CCD side 1	32-bit floating point	[N]	[1]	count
Bias2	Average electronics bias CCD side 2	32-bit floating point	[N]	[1]	count
DarkCurrentEarth	Dark current in earth data (dark_piece)	32-bit floating point	[N*107, 260]	[107, 260]	count

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Name	Description	Data Type	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
DarkExposeEarth	Integration time for dark data (expose_dark)	64-bit floating point	[N]	[1]	second
Cal	Radiometric calibration	32-bit floating point	[N*105, 260]	[105, 260]	W/(cm^3•sr)
NumberOfSwaths	Number of actual swaths in Granule	16-bit integer	[N]	[1]	unitless
NumberOfIFOVs	Number of actual IFOVs	16-bit integer	[N]	[1]	unitless
NumberOfSpectralPixels	Number of actual spectral pixels	16-bit integer	[N]	[1]	unitless
LinearityTblVersion	Version and Profile ID of on-board Linearity Table from RDR	unsigned 16-bit integer	[N*2]	[2]	unitless
GainTblVersion	Version and Profile ID of on-board Gain Table from RDR	unsigned 16-bit integer	[N*2]	[2]	unitless
BadCal	Cal factor is out of date (greater than 28 days old)	unsigned 8-bit char	[N]	[1]	unitless
SunGlint	Sun glint indication (scattering angle and surface type thresholds)	unsigned 8-bit char	[N*15, 105]	[15, 105]	unitless
SolarEclipse	All or part of the IFOV is affected by a solar eclipse, umbra or penumbra viewing.	unsigned 8-bit char	[N*15, 105]	[15, 105]	unitless
WaveFlag	Wavelength limits exceeded	unsigned 8-bit char	[N*15, 105]	[15, 105]	unitless
RadFlag	Ratio of the median radiance per spatial FOV to the maximum	32-bit floating point	[N*15, 105]	[15, 105]	unitless
TCLinearCorrection	Indicates Linearity Correction performed inflight	unsigned 8-bit char	[N*15]	[15]	unitless

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Name	Description	Data Type	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
SAA	Spacecraft within South Atlantic Anomaly (extent in percent based on Climatological data)	unsigned 8-bit char	[N*15]	[15]	unitless
QualityEarth	Earth processing reliability (cumulative relative quality indicator count)	16-bit integer	[N*15]	[15]	unitless

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2.10.1.2 OMPS TC SDR – Product Profile Data

Table 2.10.1.2-1, OMPS TC SDR Product Profile

Name	Data Size	Dimensions
SmearDataEarth	4byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Swath	Yes	No	15	15
CCD	No	No	2	2
SpectralPixel	No	No	260	260

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Raw smear counts of Earth image	0			count	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Swath	Yes	No	15	15
IFOV	No	No	105	105
SpectralPixel	No	No	260	260

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Calibrated Earth View Radiances	0			W/(cm^3•sr)	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

Wavelengths	8byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
IFOV	Yes	No	105	105

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		SpectralPixel	No	No	260	260

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Wavelengths used in SDR processing (wref)	0			nanometer	No		64-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT64_FILL	-999.9		
								MISS_FLOAT64_FILL	-999.8		
								ERR_FLOAT64_FILL	-999.5		
								VDNE_FLOAT64_FILL	-999.3		

SolarFlux — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
IFOV	Yes	No	105	105
SpectralPixel	No	No	260	260

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Reference solar flux (rsf_piece)	0			W/cm^3	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

Bias1 — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	1	1

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Average electronics bias CCD side 1	0			count	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

Bias2 — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	1	1

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		Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Average electronics bias CCD side 2	0			count	No		32-bit floating point	**Name** / **Value**: NA_FLOAT32_FILL -999.9; MISS_FLOAT32_FILL -999.8; ERR_FLOAT32_FILL -999.5; VDNE_FLOAT32_FILL -999.3	**Name** / **Value**

DarkCurrentEarth — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
IFOV	Yes	No	107	107
SpectralPixel	No	No	260	260

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Dark current in earth data (dark_piece)	0			count	No		32-bit floating point	**Name** / **Value**: NA_FLOAT32_FILL -999.9; MISS_FLOAT32_FILL -999.8; ERR_FLOAT32_FILL -999.5; VDNE_FLOAT32_FILL -999.3	**Name** / **Value**

DarkExposeEarth — 8byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	1	1

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Integration time for dark data (expose_dark)	0			second	No		64-bit floating point	**Name** / **Value**: NA_FLOAT64_FILL -999.9; MISS_FLOAT64_FILL -999.8; ERR_FLOAT64_FILL -999.5; VDNE_FLOAT64_FILL -999.3	**Name** / **Value**

Cal — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
IFOV	Yes	No	105	105
SpectralPixel	No	No	260	260

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		Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Radiometric calibration	0			W/(cm^3•sr)	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

NumberOfSwaths	2byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	1	1

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Number of actual swaths in granule	0			unitless	No		16-bit integer	**Name**	**Value**	**Name**	**Value**
								NA_INT16_FILL	-999		
								MISS_INT16_FILL	-998		
								ERR_INT16_FILL	-995		
								VDNE_INT16_FILL	-993		

NumberOfIFOVs	2byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	1	1

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Number of actual IFOVs	0			unitless	No		16-bit integer	**Name**	**Value**	**Name**	**Value**
								NA_INT16_FILL	-999		
								MISS_INT16_FILL	-998		
								ERR_INT16_FILL	-995		
								VDNE_INT16_FILL	-993		

NumberOfSpectralPixels	2byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	1	1

Datum

Description	Datum	Unscaled	Unscaled	Measurement	Scaled	Scale	Data	Fill Values	Legend

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			Offset	Valid Range Min	Valid Range Max	Units		Factor Name	Type			Entries	
		Number of actual spectral pixels	0			unitless	No		16-bit integer	Name	Value	Name	Value
										NA_INT16_FILL	-999		
										MISS_INT16_FILL	-998		
										ERR_INT16_FILL	-995		
										VDNE_INT16_FILL	-993		

LinearityTblVersion — 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	2	2

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Version and Profile ID of on-board Linearity Table from RDR	0			unitless	No		unsigned 16-bit integer	Name	Value	Name	Value
								NA_INT16_FILL	-999		
								MISS_INT16_FILL	-998		
								ERR_INT16_FILL	-995		
								VDNE_INT16_FILL	-993		

GainTblVersion — 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	2	2

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Version and Profile ID of on-board Gain Table from RDR	0			unitless	No		unsigned 16-bit integer	Name	Value	Name	Value
								NA_INT16_FILL	-999		
								MISS_INT16_FILL	-998		
								ERR_INT16_FILL	-995		
								VDNE_INT16_FILL	-993		

BadCal — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	1	1

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Cal factor is out of date (greater than	0			unitless	No		unsigned 8-bit	Name	Value	Name	Value
								NA_UINT8_FILL	255	False	0

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		28 days old)							char	MISS_UINT8_FILL	254	True	1
										ERR_UINT8_FILL	251		
										VDNE_UINT8_FILL	249		

SunGlint — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Swath	Yes	No	15	15
IFOV	No	No	105	105

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Sun glint indication (scattering angle and surface type thresholds)	0			unitless	No		unsigned 8-bit char	**Name**	**Value**	**Name**	**Value**
								NA_UINT8_FILL	255	False	0
								MISS_UINT8_FILL	254	True	1
								ERR_UINT8_FILL	251		
								VDNE_UINT8_FILL	249		

SolarEclipse — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Swath	Yes	No	15	15
IFOV	No	No	105	105

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
All or part of the IFOV is affected by a solar eclipse, umbra or penumbra viewing.	0			unitless	No		unsigned 8-bit char	**Name**	**Value**	**Name**	**Value**
								NA_UINT8_FILL	255	False	0
								MISS_UINT8_FILL	254	True	1
								ERR_UINT8_FILL	251		
								VDNE_UINT8_FILL	249		

WaveFlag — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Swath	Yes	No	15	15
IFOV	No	No	105	105

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries

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		Wavelength limits exceeded	0			unitless	No		unsigned 8-bit char	**Name** / **Value**: NA_UINT8_FILL 255; MISS_UINT8_FILL 254; ERR_UINT8_FILL 251; VDNE_UINT8_FILL 249	**Name** / **Value**: False 0; True 1		

RadFlag — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Swath	Yes	No	15	15
IFOV	No	No	105	105

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Ratio of the median radiance per spatial FOV to the maximum	0			unitless	No		32-bit floating point	**Name** / **Value**: NA_FLOAT32_FILL -999.9; MISS_FLOAT32_FILL -999.8; ERR_FLOAT32_FILL -999.5; VDNE_FLOAT32_FILL -999.3	**Name** / **Value**:

TCLinearCorrection — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Swath	Yes	No	15	15

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Linearity Correction performed inflight	0			unitless	No		unsigned 8-bit char	**Name** / **Value**: NA_UINT8_FILL 255; MISS_UINT8_FILL 254; ERR_UINT8_FILL 251; VDNE_UINT8_FILL 249	**Name** / **Value**: False 0; True 1

SAA — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Swath	Yes	No	15	15

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Spacecraft within South	0			unitless	No		unsigned 8-bit	**Name** / **Value**	**Name** / **Value**

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		Atlantic Anomaly (extent in percent based on Climatological data)							char		0% <= SAA <= 10%	0
											10% < SAA <= 20%	1
											20% < SAA <= 30%	2
											30% < SAA <= 40%	3
											40% < SAA <= 50%	4
											50% < SAA <= 60%	5
											60% < SAA <= 70%	6
											70% < SAA <= 80%	7
											80% < SAA	8

QualityEarth	2byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**							
		Swath	Yes	No	15	15							
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Earth processing reliability (cumulative relative quality indicator count)	0			unitless	No		16-bit integer	**Name**	**Value**	**Name**	**Value**
										NA_INT16_FILL	-999		
										MISS_INT16_FILL	-998		
										ERR_INT16_FILL	-995		

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2.10.1.3 OMPS TC SDR HDF5 Details

Figure 2.10.1.3-1, OMPS TC SDR UML Diagram, provides the details on the content and data types of the OMPS TC SDR. This UML diagram provides details at the granule level only. In addition to this UML diagram, refer to Section 2.1, Sensor Data Records and Temperature Data Records HDF5 Details, Figure 2.2-1, Generalized UML Diagram for HDF5 SDR/TDR Files, for a complete UML rendering of this product.

The OMPS TC SDR within the HDF5 files can be found within the Data Products group with the group name of OMPS-TC-SDR. The aggregation and granule(s) contain the data fields listed in the UML diagrams. The corresponding HDF5 data type for each field is also provided.

OMPS-TC-SDR
+SmearDataEarth : H5T_NATIVE_FLOAT +RadianceEarth : H5T_NATIVE_FLOAT +Wavelengths : H5T_NATIVE_DOUBLE +SolarFlux : H5T_NATIVE_FLOAT +Bias1 : H5T_NATIVE_FLOAT +Bias2 : H5T_NATIVE_FLOAT +DarkCurrentEarth : H5T_NATIVE_FLOAT +DarkExposeEarth : H5T_NATIVE_DOUBLE +Cal : H5T_NATIVE_FLOAT +NumberOfSwaths : H5T_NATIVE_SHORT +NumberOfIFOVs : H5T_NATIVE_SHORT +NumberOfSpectralPixels : H5T_NATIVE_SHORT +LinearityTblVersion : H5T_NATIVE_USHORT +GainTblVersion : H5T_NATIVE_USHORT +BadCal : H5T_NATIVE_UCHAR +SunGlint : H5T_NATIVE_UCHAR +SolarEclipse : H5T_NATIVE_UCHAR +WaveFlag : H5T_NATIVE_UCHAR +RadFlag : H5T_NATIVE_FLOAT +TCLinearCorrection : H5T_NATIVE_UCHAR +SAA : H5T_NATIVE_UCHAR +QualityEarth : H5T_NATIVE_SHORT

Figure 2.10.1.3-1, OMPS TC SDR UML Diagram

2.10.1.4 OMPS TC SDR HDF5 Metadata Details

The HDF5 metadata elements associated with the OMPS TC SDR are listed in the CDFCB-X Volume V, Section 4.3, HDF5 (Metadata) Hierarchy. The OMPS TC SDR metadata includes all common metadata at the root, product, aggregation, and granule levels. In addition to the common metadata items for this product, Table 2.10.1.4-1, OMPS TC SDR N_Quality_Summary Granule Level Metadata Values, provides the

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following items as name/value pairs under the granule level metadata attribute "N_Quality_Summary".

Table 2.10.1.4-1, OMPS TC SDR N_Quality_Summary Granule Level Metadata Values

N_Quality_Summary		
Name	**Value**	**Description**
Pixel	0 – 100 %	Percentage of good pixels

2.10.1.5 OMPS TC SDR Geolocation Content Summary

The OMPS TC SDR geolocation data arrays structures are summarized below in Table 2.10.1.5-1, OMPS TC SDR Geolocation Data Array Summary.

Table 2.10.1.5-1, OMPS TC SDR Geolocation Data Content Summary

Name	Description	Data Type	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
StartTime	Starting Time of Swath in IET (1/1/1958)	64-bit integer	[N*15]	[15]	microsecond
MidTime	Mid Time of Swath in IET(1/1/1958)	64-bit integer	[N*15]	[15]	microsecond
Latitude	Latitude of each IFOV (positive North)	32-bit floating point	[N*15, 105]	[15, 105]	degree
Longitude	Longitude of each IFOV (positive East)	32-bit floating point	[N*15, 105]	[15, 105]	degree
LatitudeCorners	Latitude of each IFOV Corner – Array starts at upper right and proceeds clockwise	32-bit floating point	[N*15, 105, 4]	[15, 105, 4]	degree
LongitudeCorners	Longitude of each IFOV Corner - Array starts at upper right and proceeds clockwise	32-bit floating point	[N*15, 105, 4]	[15, 105, 4]	degree
SolarZenithAngle	Zenith angle of sun at each IFOV position	32-bit floating point	[N*15, 105]	[15, 105]	degree

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Name	Description	Data Type	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
SolarAzimuthAngle	Azimuth angle of sun (measured clockwise positive from North) at each IFOV position	32-bit floating point	[N*15, 105]	[15, 105]	degree
SatelliteZenithAngle	Zenith angle to satellite at each IFOV position	32-bit floating point	[N*15, 105]	[15, 105]	degree
SatelliteAzimuthAngle	Azimuth angle (measured clockwise positive from North) to Satellite at each IFOV position	32-bit floating point	[N*15, 105]	[15, 105]	degree
RelativeAzimuthAngle	Difference between solar and satellite azimuth angles at each IFOV position (solar – satellite)	32-bit floating point	[N*15, 105]	[15, 105]	degree
Height	Ellipsoid-Geoid separation	32-bit floating point	[N*15, 105]	[15, 105]	meter
SatelliteRange	Line of sight distance from the ellipsoid intersection to the satellite	32-bit floating point	[N*15, 105]	[15, 105]	meter
MoonVector	Lunar position in Spacecraft Coordinates at MidTime	32-bit floating point	[N*15, 3]	[15, 3]	meter
SunVector	Solar position in Spacecraft Coordinates at MidTime	32-bit floating point	[N*15, 3]	[15, 3]	meter
SCPosition	Spacecraft position in ECR Coordinates (X, Y, Z) at MidTime	32-bit floating point	[N*15, 3]	[15, 3]	meter

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Name	Description	Data Type	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
SCVelocity	Spacecraft velocity in ECR Coordinates (dx/dt, dy/dt, dz/dt) at MidTime	32-bit floating point	[N*15, 3]	[15, 3]	m/s
SCAttitude	Spacecraft attitude with respect to the Geodetic Reference Frame (roll, pitch, yaw) at MidTime	32-bit floating point	[N*15, 3]	[15, 3]	arcsecond
NumberOfSwaths	Number of actual swaths in granule	16-bit integer	[N]	[1]	unitless
NumberOfIFOVs	Number of actual IFOVs	16-bit integer	[N]	[1]	unitless
QF1_OMPSTCGEO	Attitude/Ephemeris availability status	unsigned 8-bit char	[N*15]	[15]	unitless

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2.10.1.6 OMPS TC SDR Geolocation Product Profile

Table 2.10.1.6-1, OMPS TC SDR Geolocation Product Profile

Fields																
Name	**Data Size**	**Dimensions**														
StartTime	8byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**										
		Swath	Yes	No	15	15										
		Datum														
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**				
		Starting Time of Swath in IET (1/1/1958)	0			microsecond	No		64-bit integer	**Name**	**Value**	**Name**	**Value**			
										NA_INT64_FILL	-999					
										MISS_INT64_FILL	-998					
										ERR_INT64_FILL	-995					
										VDNE_INT64_FILL	-993					
MidTime	8byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**										
		Swath	Yes	No	15	15										
		Datum														
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**				
		Mid Time of Swath in IET (1/1/1958)	0			microsecond	No		64-bit integer	**Name**	**Value**	**Name**	**Value**			
										NA_INT64_FILL	-999					
										MISS_INT64_FILL	-998					
										ERR_INT64_FILL	-995					
										VDNE_INT64_FILL	-993					
Latitude	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**										
		Swath	Yes	No	15	15										
		IFOV	No	No	105	105										
		Datum														
		Description	**Datum**	**Unscaled**	**Unscaled**	**Measurement**	**Scaled**	**Scale**	**Data**	**Fill Values**		**Legend**				

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			Offset	Valid Range Min	Valid Range Max	Units		Factor Name	Type			Entries	
		Latitude of each IFOV (positive North)	0	-90	90	degree	No		32-bit floating point	Name	Value	Name	Value
										NA_FLOAT32_FILL	-999.9		
										MISS_FLOAT32_FILL	-999.8		
										ERR_FLOAT32_FILL	-999.5		
										VDNE_FLOAT32_FILL	-999.3		
Longitude	4byte(s)	Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size							
		Swath	Yes	No	15	15							
		IFOV	No	No	105	105							
		Datum											
		Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
		Longitude of each IFOV (positive East)	0	-180	180	degree	No		32-bit floating point	Name	Value	Name	Value
										NA_FLOAT32_FILL	-999.9		
										MISS_FLOAT32_FILL	-999.8		
										ERR_FLOAT32_FILL	-999.5		
										VDNE_FLOAT32_FILL	-999.3		
LatitudeCorners	4byte(s)	Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size							
		Swath	Yes	No	15	15							
		IFOV	No	No	105	105							
		Corner	No	No	4	4							
		Datum											
		Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
		Latitude of each IFOV corner – Array starts at upper right and proceeds clockwise	0	-90	90	degree	No		32-bit floating point	Name	Value	Name	Value
										NA_FLOAT32_FILL	-999.9		
										MISS_FLOAT32_FILL	-999.8		
										ERR_FLOAT32_FILL	-999.5		
										VDNE_FLOAT32_FILL	-999.3		
LongitudeCorners	4byte(s)	Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size							
		Swath	Yes	No	15	15							

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IFOV	No	No	105	105
Corner	No	No	4	4

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Longitude of each IFOV corner – Array starts at upper right and proceeds clockwise	0	-180	180	degree	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

SolarZenithAngle — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Swath	Yes	No	15	15
IFOV	No	No	105	105

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Zenith angle of sun at each IFOV position	0	0	180	degree	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

SolarAzimuthAngle — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Swath	Yes	No	15	15
IFOV	No	No	105	105

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Azimuth angle of sun (measured clockwise positive from	0	-180	180	degree	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		

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		North) at each IFOV position								VDNE_FLOAT32_FILL	-999.3	

SatelliteZenithAngle — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Swath	Yes	No	15	15
IFOV	No	No	105	105

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Zenith angle to satellite at each IFOV position	0	0	~70	degree	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

SatelliteAzimuthAngle — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Swath	Yes	No	15	15
IFOV	No	No	105	105

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Azimuth angle (measured clockwise positive from North) to Satellite at each IFOV position	0	-180	180	degree	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

RelativeAzimuthAngle — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Swath	Yes	No	15	15
IFOV	No	No	105	105

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Difference between solar	0	-180	180	degree	No		32-bit floating				

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		and satellite azimuth angles at each IFOV position (solar – satellite)							point	NA_FLOAT32_FILL MISS_FLOAT32_FILL ERR_FLOAT32_FILL VDNE_FLOAT32_FILL	-999.9 -999.8 -999.5 -999.3	

Height — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Swath	Yes	No	15	15
IFOV	No	No	105	105

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Ellipsoid-Geoid separation	0			meter	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

SatelliteRange — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Swath	Yes	No	15	15
IFOV	No	No	105	105

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Line of sight distance from the ellipsoid intersection to the satellite	0			meter	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

MoonVector — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Swath	Yes	No	15	15
SCCoordinate	No	No	3	3

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries

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		Lunar Position in Spacecraft Coordinates at MidTime	0			meter	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
										NA_FLOAT32_FILL	-999.9		
										MISS_FLOAT32_FILL	-999.8		
										ERR_FLOAT32_FILL	-999.5		
										VDNE_FLOAT32_FILL	-999.3		

SunVector — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Swath	Yes	No	15	15
SCCoordinate	No	No	3	3

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Solar position in Spacecraft Coordinates at MidTime	0			meter	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

SCPosition — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Swath	Yes	No	15	15
ECRCoordinate	No	No	3	3

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Spacecraft position in ECR Coordinates (X, Y, Z) at MidTime	0			meter	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

SCVelocity — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Swath	Yes	No	15	15
ECRCoordinate	No	No	3	3

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries

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		Spacecraft velocity in ECR Coordinates (dx/dt, dy/dt, dz/dt) at MidTime	0			m/s	No		32-bit floating point	**Name** / **Value**: NA_FLOAT32_FILL -999.9; MISS_FLOAT32_FILL -999.8; ERR_FLOAT32_FILL -999.5; VDNE_FLOAT32_FILL -999.3	**Name** / **Value**	

SCAttitude — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Swath	Yes	No	15	15
GRFCoordinate	No	No	3	3

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Spacecraft attitude with respect to the Geodetic Reference Frame (roll, pitch, yaw) at MidTime.	0			arcsecond	No		32-bit floating point	**Name** / **Value**: NA_FLOAT32_FILL -999.9; MISS_FLOAT32_FILL -999.8; ERR_FLOAT32_FILL -999.5; VDNE_FLOAT32_FILL -999.3	**Name** / **Value**

NumberOfSwaths — 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	1	1

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Number of actual swaths in granule		0		unitless	No		16-bit integer	**Name** / **Value**: NA_INT16_FILL -999; MISS_INT16_FILL -998; ERR_INT16_FILL -995; VDNE_INT16_FILL -993	**Name** / **Value**

NumberOfIFOVs — 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	1	1

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries

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		Number of actual IFOVs		0		unitless	No		16-bit integer	**Name**	**Value**	**Name**	**Value**
										NA_INT16_FILL	-999		
										MISS_INT16_FILL	-998		
										ERR_INT16_FILL	-995		
										VDNE_INT16_FILL	-993		

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Table 2.10.1.6-2, OMPS TC SDR Geolocation Product Profile – Quality Flags

Name	Data Size	Dimensions
QF1_OMPSTCGEO	1byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Swath	Yes	No	15	15

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Attitude and Ephemeris Availability Status	0			unitless	No		2 bit(s)			Nominal - E&A data available	0
										Missing Data <= Small Gap	1
										Small Gap < Missing Data < Granule Boundary	2
										Missing Data >= Granule Boundary	3
Spare	2			unitless	No		6 bit(s)	Name	Value	Name	Value

2.10.1.7 OMPS TC SDR Geolocation HDF5 Details

The OMPS TC SDR Geolocation is based on a simple spatial average over the geometric cell bounds, regardless of pixel sampling. Geolocation is reported on the ellipsoid. Figure 2.10.1.7-1, OMPS TC SDR Geolocation UML Diagram, provides details on the contents and data types of the OMPS TC SDR geolocation.

OMPS-TC-GEO
+StartTime : H5T_NATIVE_LLONG +MidTime : H5T_NATIVE_LLONG +Latitude : H5T_NATIVE_FLOAT +Longitude : H5T_NATIVE_FLOAT +LatitudeCorners : H5T_NATIVE_FLOAT +LongitudeCorners : H5T_NATIVE_FLOAT +SolarZenithAngle : H5T_NATIVE_FLOAT +SolarAzimuthAngle : H5T_NATIVE_FLOAT +SatelliteZenithAngle : H5T_NATIVE_FLOAT +SatelliteAzimuthAngle : H5T_NATIVE_FLOAT +RelativeAzimuthAngle : H5T_NATIVE_FLOAT +Height : H5T_NATIVE_FLOAT +SatelliteRange : H5T_NATIVE_FLOAT +MoonVector : H5T_NATIVE_FLOAT +SunVector : H5T_NATIVE_FLOAT +SCPosition : H5T_NATIVE_FLOAT +SCVelocity : H5T_NATIVE_FLOAT +SCAttitude : H5T_NATIVE_FLOAT +NumberOfSwaths : H5T_NATIVE_SHORT +NumberOfIFOVs : H5T_NATIVE_SHORT +QF1_OMPSTCGEO : H5T_NATIVE_UCHAR

Figure 2.10.1.7-1, OMPS TC SDR Geolocation UML Diagram

2.10.1.8 OMPS TC SDR Geolocation Metadata Details

The HDF5 metadata elements associated with the OMPS TC SDR Geolocation are listed in the CDFCB-X Volume V, Section 4.3, HDF5 (Metadata) Hierarchy. There are no additional metadata elements or granule level quality flags for this geolocation.

2.10.2 OMPS TC Calibration SDR

The OMPS TC calibration SDR dataset and metadata formats are described in the following subparagraphs.

2.10.2.1 OMPS TC Calibration SDR Data Content Summary

The OMPS TC Calibration SDR product structure contains the data arrays shown below in Table 2.10.2.1-1, OMPS TC Calibration SDR Data Array Summary.

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Table 2.10.2.1-1, OMPS TC Calibration SDR Data Content Summary

Name	Description	Data Type	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
Bias1	Average electronics bias CCD side 1	32-bit floating point	[N]	[1]	count
Bias2	Average electronics bias CCD side 2	32-bit floating point	[N]	[1]	count
DarkData	Dark current corrected coadded counts	32-bit floating point	[N*364, 780]	[364, 780]	count
DarkCurrentExpose	Exposure time of dark current (expose_dark)	64-bit floating point	[N]	[1]	second
LampExpose	Exposure time of lamp counts (expose_lamp)	64-bit floating point	[N]	[1]	second
BadPixelMap	Map of pixels used for solar data (badpix)	32-bit floating point	[N*260, 740]	[260, 740]	unitless
WavelengthMap	Wavelength map (wmap)	64-bit floating point	[N*260, 740]	[260, 740]	unitless
Flat	Local relative normalized radiometric sensitivities	32-bit floating point	[N*260, 740]	[260, 740]	unitless
NumberOfWorkingSolar	Number of solar frames from working diffuser	16-bit integer	[N]	[1]	unitless
NumberOfReferenceSolar	Number of solar frames from reference diffuser	16-bit integer	[N]	[1]	unitless
NumberOfDark	Number of dark frames (images)	16-bit integer	[N]	[1]	unitless
NumberOfLamp	Number of lamp frames (images)	16-bit integer	[N]	[1]	unitless
NumberOfCoaddsSolar	Number of Co-adds during solar calibration	16-bit integer	[N]	[1]	unitless

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Name	Description	Data Type	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
NumberOfCoaddsDark	Number of coadds during Dark calibration	16-bit integer	[N]	[1]	unitless
NumberOfCoaddsLamp	Number of coadds during Lamp calibration.	16-bit integer	[N]	[1]	unitless
CCD	Count rate of sun (ccd)	64-bit floating point	[N*260, 740]	[260, 740]	count/second
TotalSolarExpose	Total Solar Exposure time (total_sol_expose)	64-bit floating point	[N]	[1]	second
RSFCounts	Reference solar counts (rsf_data)	32-bit floating point	[N*260, 740]	[260 ,740]	count
RSFExpose	Reference solar exposure time (rsf_expose)	32-bit floating point	[N]	[1]	second
RawSolar	Raw Solar Radiances	32-bit floating point	[N*63, 260, 200]	[63, 260, 200]	count
SmearDataSolar	Smear Data Solar Radiances	32-bit floating point	[N*63,260, 2]	[63, 260, 2]	count
SolarBeta1	Angle between orbital plane and sun at start of solar observation	32-bit floating point	[N*63]	[63]	degree
SolarBeta2	Angle between orbital plane and sun at end of solar observation	32-bit floating point	[N*63]	[63]	degree
DiffIncinAngle	Angle from normal of incident solar flux	32-bit floating point	[N*63]	[63]	degree
DiffuserPositionSolar	Starting and ending pixel column for each solar measurement	16-bit integer	[N*63, 2]	[63, 2]	unitless
YearSolar	Year of Solar Observation	32-bit integer	[N*63]	[63]	year

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Name	Description	Data Type	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
DaySolar	Day of Year for Solar Observation	32-bit integer	[N*63]	[63]	day
DiffuserSurfaceSolar	Diffuser Surface used for Solar Calibration	32-bit integer	[N*63]	[63]	unitless
TccdTCSolar	CCD Temperature	16-bit integer	[N*63]	[63]	count
TmotnadSolar	Motor Temperature at Nadir	16-bit integer	[N*63]	[63]	count
TlmpnadSolar	Lamp Temperature at Nadir	16-bit integer	[N*63]	[63]	count
TradnadSolar	Radiator Temperature at Nadir	16-bit integer	[N*63]	[63]	count
Tel1nadSolar	Electronics 1 Temperature at Nadir	16-bit integer	[N*63]	[63]	count
Tel2nadSolar	Electronics 2 Temperature at Nadir	16-bit integer	[N*63]	[63]	count
PccdTCSolar	Profile of CCD	16-bit integer	[N*63]	[63]	count
VtecTCSolar	Voltage of Electronics	16-bit integer	[N*63]	[63]	count
CtecTCSolar	Electronics current	16-bit integer	[N*63]	[63]	count
GonPar	Goniometric correction to solar counts	32-bit floating point	[N*63, 260, 200	[63, 260, 200]	unitless
FluxData	Final corrected solar counts of individual solar observation	32-bit floating point	[N*63, 260, 200	[63, 260, 200]	W/cm^3
TccdTCDark	CCD Temperature	16-bit integer	[N*5]	[5]	count
TmotnadDark	Motor Temperature at Nadir	16-bit integer	[N*5]	[5]	count

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Name	Description	Data Type	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
TlmpnadDark	Lamp Temperature at Nadir	16-bit integer	[N*5]	[5]	count
TradnadDark	Radiator Temperature at Nadir	16-bit integer	[N*5]	[5]	count
Tel1nadDark	Electronics 1 Temperature at Nadir	16-bit integer	[N*5]	[5]	count
Tel2nadDark	Electronics 2 Temperature at Nadir	16-bit integer	[N*5]	[5]	count
PccdTCDark	Profile of CCD	16-bit integer	[N*5]	[5]	count
VtecTCDark	Voltage of Electronics	16-bit integer	[N*5]	[5]	count
CtecTCDark	Current of Electronics	16-bit integer	[N*5]	[5]	count
DarkArray	Correct counts of an individual dark current image	32-bit floating point	[N*5, 364, 780]	[5, 364, 780]	count
TccdTCLamp	CCD Temperature	16-bit integer	[N*150]	[150]	count
TmotnadLamp	Motor Temperature at Nadir	16-bit integer	[N*150]	[150]	count
TlmpnadLamp	Lamp Temperature at Nadir	16-bit integer	[N*150]	[150]	count
TradnadLamp	Radiator Temperature at Nadir	16-bit integer	[N*150]	[150]	count
Tel1nadLamp	Electronics 1 Temperature at Nadir	16-bit integer	[N*150]	[150]	count
Tel2nadLamp	Electronics 2 Temperature at Nadir	16-bit integer	[N*150]	[150]	count
PccdTCLamp	Profile of CCD	16-bit integer	[N*150]	[150]	count

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Name	Description	Data Type	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
VtecTCLamp	Voltage of Electronics	16-bit integer	[N*150]	[150]	count
CtecTCLamp	Current of Electronics	16-bit integer	[N*150]	[150]	count
LampData	Correct counts of an individual lamp image	32-bit floating point	[N*150, 364, 780]	[150, 364, 780]	count
QualityLamp	Reliability of lamp processing	16-bit integer	[N*150]	[150]	unitless
QualitySolar	Reliability of solar processing	16-bit integer	[N*63]	[63]	unitless
QualityDark	Reliability of dark processing	16-bit integer	[N*5]	[5]	unitless
MedianDark	Median dark current	32-bit floating point	[N]	[1]	count
Fitness	Chi-squared goodness of fit for wavelengths	64-bit floating point	[N*105]	[105]	unitless
CompleteFlag	Completeness of solar calibration data	16-bit integer	[N]	[1]	unitless
SAALamp	Spacecraft within South Atlantic Anomaly during Lamp calibration (extent in percent based on Climatological data)	unsigned 8-bit char	[N*150]	[150]	unitless
SAASolar	Spacecraft within South Atlantic Anomaly during Solar calibration (extent in percent based on Climatological data)	unsigned 8-bit char	[N*63]	[63]	unitless

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Name	Description	Data Type	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
SAADark	Spacecraft within South Atlantic Anomaly during Dark calibration (extent in percent based on Climatological data)	unsigned 8-bit char	[N*5]	[5]	unitless
Eclipse	Eclipse - All or part of the S/C is affected by a solar eclipse, umbra or penumbra viewing.	unsigned 8-bit char	[N*63]	[63]	unitless
OccultationFlag	Occultation of the diffuser during solar observation	unsigned 8-bit char	[N*63]	[63]	unitless

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2.10.2.2 OMPS TC Calibration SDR Product Profile

Table 2.10.2.2-1, OMPS TC Calibration SDR Product Profile

Name	Data Size	Dimensions
Bias1	4byte(s)	
Bias2	4byte(s)	
DarkData	4byte(s)	

Bias1 — Dimensions

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	1	1

Bias1 — Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Average electronics bias CCD side 1	0			count	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

Bias2 — Dimensions

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	1	1

Bias2 — Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Average electronics bias CCD side 2	0			count	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

DarkData — Dimensions

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
SpectralPixel	Yes	No	364	364
SpatialPixel	No	No	780	780

DarkData — Datum

Description	Datum	Unscaled Valid	Unscaled Valid	Measurement Units	Scaled	Scale Facto	Data Type	Fill Values	Legend Entries

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			Offset	Range Min	Range Max			r Name					
		Dark current corrected coadded counts	0			count	No		32-bit floating point	Name	Value	Name	Value
										NA_FLOAT32_FILL	-999.9		
										MISS_FLOAT32_FILL	-999.8		
										ERR_FLOAT32_FILL	-999.5		
										VDNE_FLOAT32_FILL	-999.3		

DarkCurrentExpose — 8byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	1	1

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Exposure time of dark current (expose_dark)	0			second	No		64-bit floating point	Name	Value	Name	Value
								NA_FLOAT64_FILL	-999.9		
								MISS_FLOAT64_FILL	-999.8		
								ERR_FLOAT64_FILL	-999.5		
								VDNE_FLOAT64_FILL	-999.3		

LampExpose — 8byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	1	1

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Exposure time of lamp counts (expose_lamp)	0			second	No		64-bit floating point	Name	Value	Name	Value
								NA_FLOAT64_FILL	-999.9		
								MISS_FLOAT64_FILL	-999.8		
								ERR_FLOAT64_FILL	-999.5		
								VDNE_FLOAT64_FILL	-999.3		

BadPixelMap — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
SpectralPixel	Yes	No	260	260
SpatialPixel	No	No	740	740

Datum

Description	Datum Offset	Unscaled Valid Range	Unscaled Valid Range	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries

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				Min	Max						
		Map of pixels used for solar data (badpix)	0			unitless	No		32-bit floating point	Name: NA_FLOAT32_FILL, Value: -999.9 Name: MISS_FLOAT32_FILL, Value: -999.8 Name: ERR_FLOAT32_FILL, Value: -999.5 Name: VDNE_FLOAT32_FILL, Value: -999.3	Name: Value:

WavelengthMap — 8byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
SpectralPixel	Yes	No	260	260
SpatialPixel	No	No	740	740

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Wavelength map (wmap)	0			unitless	No		64-bit floating point	Name: NA_FLOAT64_FILL, Value: -999.9 Name: MISS_FLOAT64_FILL, Value: -999.8 Name: ERR_FLOAT64_FILL, Value: -999.5 Name: VDNE_FLOAT64_FILL, Value: -999.3	Name: Value:

Flat — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
SpectralPixel	Yes	No	260	260
SpatialPixel	No	No	740	740

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Local relative normalized radiometric sensitivities	0			unitless	No		32-bit floating point	Name: NA_FLOAT32_FILL, Value: -999.9 Name: MISS_FLOAT32_FILL, Value: -999.8 Name: ERR_FLOAT32_FILL, Value: -999.5 Name: VDNE_FLOAT32_FILL, Value: -999.3	Name: Value:

NumberOfWorkingSolar — 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	1	1

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries

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		Number of solar frames from the working diffuser	0			unitless	No		16-bit integer	**Name** / **Value** NA_INT16_FILL / -999 MISS_INT16_FILL / -998 ERR_INT16_FILL / -995 VDNE_INT16_FILL / -993	**Name** / **Value**		
NumberOfReferenceSolar	2byte(s)	**Name** / **Granule Boundary** / **Dynamic** / **Min Array Size** / **Max Array Size** Granule / Yes / No / 1 / 1											
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Number of solar frames from the reference diffuser	0			unitless	No		16-bit integer	**Name** / **Value** NA_INT16_FILL / -999 MISS_INT16_FILL / -998 ERR_INT16_FILL / -995 VDNE_INT16_FILL / -993	**Name** / **Value**		
NumberOfDark	2byte(s)	**Name** / **Granule Boundary** / **Dynamic** / **Min Array Size** / **Max Array Size** Granule / Yes / No / 1 / 1											
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Number of dark frames (images)	0			unitless	No		16-bit integer	**Name** / **Value** NA_INT16_FILL / -999 MISS_INT16_FILL / -998 ERR_INT16_FILL / -995 VDNE_INT16_FILL / -993	**Name** / **Value**		
NumberOfLamp	2byte(s)	**Name** / **Granule Boundary** / **Dynamic** / **Min Array Size** / **Max Array Size** Granule / Yes / No / 1 / 1											
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Number of lamp frames (images)	0			unitless	No		16-bit integer	**Name** / **Value** NA_INT16_FILL / -999 MISS_INT16_FILL / -998	**Name** / **Value**		

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										ERR_INT16_FILL	-995	
										VDNE_INT16_FILL	-993	

NumberOfCoaddsSolar — 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	1	1

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Number of co-adds during solar calibration	0			unitless	No		16-bit integer	**Name**	**Value**	**Name**	**Value**
								NA_INT16_FILL	-999		
								MISS_INT16_FILL	-998		
								ERR_INT16_FILL	-995		
								VDNE_INT16_FILL	-993		

NumberOfCoaddsDark — 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	1	1

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Number of co-adds during dark calibration	0			unitless	No		16-bit integer	**Name**	**Value**	**Name**	**Value**
								NA_INT16_FILL	-999		
								MISS_INT16_FILL	-998		
								ERR_INT16_FILL	-995		
								VDNE_INT16_FILL	-993		

NumberOfCoaddsLamp — 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	1	1

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Number of co-adds during lamp calibration	0			unitless	No		16-bit integer	**Name**	**Value**	**Name**	**Value**
								NA_INT16_FILL	-999		
								MISS_INT16_FILL	-998		
								ERR_INT16_FILL	-995		
								VDNE_INT16_FILL	-993		

CCD — 8byte(

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size

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	s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
SpectralPixel	Yes	No	260	260
SpatialPixel	No	No	740	740

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Count rate of sun (ccd)	0			count/second	No		64-bit floating point	NA_FLOAT64_FILL	-999.9		
								MISS_FLOAT64_FILL	-999.8		
								ERR_FLOAT64_FILL	-999.5		
								VDNE_FLOAT64_FILL	-999.3		

TotalSolarExpose	8byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
FOV	Yes	No	1	1

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Total Solar Exposure time (total_sol_expose)	0			second	No		64-bit floating point	NA_FLOAT64_FILL	-999.9		
								MISS_FLOAT64_FILL	-999.8		
								ERR_FLOAT64_FILL	-999.5		
								VDNE_FLOAT64_FILL	-999.3		

RSFCounts	4byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
SpectralPixel	Yes	No	260	260
SpatialPixel	No	No	740	740

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Reference solar counts (rsf_data)	0			count	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

RSFExpose	4byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	1	1

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		Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Reference solar exposure time (rsf_expose)	0			second	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

RawSolar — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Solar	Yes	No	63	63
SpectralPixel	No	No	260	260
SpatialPixel	No	No	200	200

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Raw Solar Radiances	0			count	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

SmearDataSolar — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Solar	Yes	No	63	63
SpectralPixel	No	No	260	260
SpatialPixel	No	No	2	2

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Smear Data Solar Radiances	0			count	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

SolarBeta1 — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size

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Solar	Yes	No	63	63		

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Angle between orbital plane and sun at start of solar observation	0			degree	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

SolarBeta2 — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Solar	Yes	No	63	63

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Angle between orbital plane and sun at end of solar observation	0			degree	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

DiffIncinAngle — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Solar	Yes	No	63	63

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Angle from normal of incident solar flux	0			degree	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

DiffuserPositionSolar — 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Solar	Yes	No	63	63
Time	No	No	2	2

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		Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Starting and Ending pixel column for each solar measurement	0			unitless	No		16-bit integer	**Name**	**Value**	**Name**	**Value**
								NA_INT16_FILL	-999		
								MISS_INT16_FILL	-998		
								ERR_INT16_FILL	-995		
								VDNE_INT16_FILL	-993		

YearSolar	4byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Solar	Yes	No	63	63

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Year of Solar Observation	0			year	No		32-bit integer	**Name**	**Value**	**Name**	**Value**
								NA_INT32_FILL	-999		
								MISS_INT32_FILL	-998		
								ERR_INT32_FILL	-995		
								VDNE_INT32_FILL	-993		

DaySolar	4byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Solar	Yes	No	63	63

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Day of Year for Solar Observation	0			day	No		32-bit integer	**Name**	**Value**	**Name**	**Value**
								NA_INT32_FILL	-999		
								MISS_INT32_FILL	-998		
								ERR_INT32_FILL	-995		
								VDNE_INT32_FILL	-993		

DiffuserSurfaceSolar	4byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Solar	Yes	No	63	63

Datum

Description	Datum	Unscaled	Unscaled	Measurement	Scaled	Scale	Data	Fill Values	Legend

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			Offset	Valid Range Min	Valid Range Max	Units		Factor Name	Type			Entries	
		Diffuser Surface used for Solar Calibration	0			unitless	No		32-bit integer	Name	Value	Name	Value
										NA_INT32_FILL	-999		
										MISS_INT32_FILL	-998		
										ERR_INT32_FILL	-995		
										VDNE_INT32_FILL	-993		

TccdTCSolar — 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Solar	Yes	No	63	63

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
CCD Temperature	0			count	No		16-bit integer	Name	Value	Name	Value
								NA_INT16_FILL	-999		
								MISS_INT16_FILL	-998		
								ERR_INT16_FILL	-995		
								VDNE_INT16_FILL	-993		

TmotnadSolar — 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Solar	Yes	No	63	63

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Motor Temperature at Nadir	0			count	No		16-bit integer	Name	Value	Name	Value
								NA_INT16_FILL	-999		
								MISS_INT16_FILL	-998		
								ERR_INT16_FILL	-995		
								VDNE_INT16_FILL	-993		

TImpnadSolar — 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Solar	Yes	No	63	63

Datum

Description	Datum Offset	Unscaled Valid Range	Unscaled Valid Range	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries

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				Min	**Max**						
		Lamp Temperature at Nadir	0			count	No		16-bit integer	**Name** / **Value**: NA_INT16_FILL -999; MISS_INT16_FILL -998; ERR_INT16_FILL -995; VDNE_INT16_FILL -993	**Name** / **Value**

TradnadSolar — 2byte(s)

Name	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**
Solar	Yes	No	63	63

Datum

Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**	**Legend Entries**
Radiator Temperature at Nadir	0			count	No		16-bit integer	**Name** / **Value**: NA_INT16_FILL -999; MISS_INT16_FILL -998; ERR_INT16_FILL -995; VDNE_INT16_FILL -993	**Name** / **Value**

Tel1nadSolar — 2byte(s)

Name	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**
Solar	Yes	No	63	63

Datum

Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**	**Legend Entries**
Electronics 1 Temperature at Nadir	0			count	No		16-bit integer	**Name** / **Value**: NA_INT16_FILL -999; MISS_INT16_FILL -998; ERR_INT16_FILL -995; VDNE_INT16_FILL -993	**Name** / **Value**

Tel2nadSolar — 2byte(s)

Name	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**
Solar	Yes	No	63	63

Datum

Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**	**Legend Entries**
Electronics 2	0			count	No		16-bit	**Name** / **Value**	**Name** / **Value**

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		Temperature at Nadir							integer	NA_INT16_FILL	-999	
										MISS_INT16_FILL	-998	
										ERR_INT16_FILL	-995	
										VDNE_INT16_FILL	-993	

PccdTCSolar — 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Solar	Yes	No	63	63

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Profile of CCD	0			count	No		16-bit integer	NA_INT16_FILL	-999		
								MISS_INT16_FILL	-998		
								ERR_INT16_FILL	-995		
								VDNE_INT16_FILL	-993		

VtecTCSolar — 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Solar	Yes	No	63	63

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Voltage of Electronics	0			count	No		16-bit integer	NA_INT16_FILL	-999		
								MISS_INT16_FILL	-998		
								ERR_INT16_FILL	-995		
								VDNE_INT16_FILL	-993		

CtecTCSolar — 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Solar	Yes	No	63	63

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Electronics current	0			count	No		16-bit integer	NA_INT16_FILL	-999		
								MISS_INT16_FILL	-998		

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										ERR_INT16_FILL	-995
										VDNE_INT16_FILL	-993

GonPar — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Solar	Yes	No	63	63
SpectralPixel	No	No	260	260
SpatialPixel	No	No	200	200

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Goniometric correction to solar counts	0		.	unitless	No		32-bit floating point	Name	Value	Name	Value
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

FluxData — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Solar	Yes	No	63	63
SpectralPixel	No	No	260	260
SpatialPixel	No	No	200	200

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Final corrected solar counts of individual solar observation	0			W/cm^3	No		32-bit floating point	Name	Value	Name	Value
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

TccdTCDark — 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Dark	Yes	No	5	5

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
CCD	0			count	No		16-bit	Name	Value	Name	Value

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		Temperature								integer	NA_INT16_FILL	-999
											MISS_INT16_FILL	-998
											ERR_INT16_FILL	-995
											VDNE_INT16_FILL	-993

TmotnadDark — 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Dark	Yes	No	5	5

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Motor Temperature at Nadir	0			count	No		16-bit integer	**Name**	**Value**	**Name**	**Value**
								NA_INT16_FILL	-999		
								MISS_INT16_FILL	-998		
								ERR_INT16_FILL	-995		
								VDNE_INT16_FILL	-993		

TlmpnadDark — 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Dark	Yes	No	5	5

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Lamp Temperature at Nadir	0			count	No		16-bit integer	**Name**	**Value**	**Name**	**Value**
								NA_INT16_FILL	-999		
								MISS_INT16_FILL	-998		
								ERR_INT16_FILL	-995		
								VDNE_INT16_FILL	-993		

TradnadDark — 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Dark	Yes	No	5	5

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Radiator Temperature at Nadir	0			count	No		16-bit integer	**Name**	**Value**	**Name**	**Value**
								NA_INT16_FILL	-999		
								MISS_INT16_FILL	-998		

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										ERR_INT16_FILL	-995	
										VDNE_INT16_FILL	-993	
Tel1nadDark	2byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**						
		Dark	Yes	No	5	5						
		Datum										
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**
		Electronics 1 Temperature at Nadir	0			count	No		16-bit integer	**Name**	**Value**	**Name** **Value**
										NA_INT16_FILL	-999	
										MISS_INT16_FILL	-998	
										ERR_INT16_FILL	-995	
										VDNE_INT16_FILL	-993	
Tel2nadDark	2byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**						
		Dark	Yes	No	5	5						
		Datum										
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**
		Electronics 2 Temperature at Nadir	0			count	No		16-bit integer	**Name**	**Value**	**Name** **Value**
										NA_INT16_FILL	-999	
										MISS_INT16_FILL	-998	
										ERR_INT16_FILL	-995	
										VDNE_INT16_FILL	-993	
PccdTCDark	2byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**						
		Dark	Yes	No	5	5						
		Datum										
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**
		Profile of CCD	0			count	No		16-bit integer	**Name**	**Value**	**Name** **Value**
										NA_INT16_FILL	-999	
										MISS_INT16_FILL	-998	
										ERR_INT16_FILL	-995	
										VDNE_INT16_FILL	-993	

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VtecTCDark	2byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**											
		Dark	Yes	No	5	5											
		Datum															
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**					
		Voltage of Electronics	0			count	No		16-bit integer	**Name**	**Value**	**Name**	**Value**				
										NA_INT16_FILL	-999						
										MISS_INT16_FILL	-998						
										ERR_INT16_FILL	-995						
										VDNE_INT16_FILL	-993						
CtecTCDark	2byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**											
		Dark	Yes	No	5	5											
		Datum															
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**					
		Current of Electronics	0			count	No		16-bit integer	**Name**	**Value**	**Name**	**Value**				
										NA_INT16_FILL	-999						
										MISS_INT16_FILL	-998						
										ERR_INT16_FILL	-995						
										VDNE_INT16_FILL	-993						
DarkArray	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**											DarkArray
		Dark	No	No	5	5											
		SpectralPixel	No	No	364	364											
		SpatialPixel	Yes	No	780	780											
		Datum															
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**					
		Correct counts of an individual dark current image	0			count	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**				
										NA_FLOAT32_FILL	-999.9						
										MISS_FLOAT32_FILL	-999.8						
										ERR_FLOAT32_FILL	-999.5						
										VDNE_FLOAT32_FILL	-999.3						

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TccdTCLamp	2byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**									
		Lamp	Yes	No	150	150									
		Datum													
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**			
		CCD Temperature	0			count	No		16-bit integer	**Name**	**Value**	**Name**	**Value**		
										NA_INT16_FILL	-999				
										MISS_INT16_FILL	-998				
										ERR_INT16_FILL	-995				
										VDNE_INT16_FILL	-993				
TmotnadLamp	2byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**									
		Lamp	Yes	No	150	150									
		Datum													
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**			
		Motor Temperature at Nadir	0			count	No		16-bit integer	**Name**	**Value**	**Name**	**Value**		
										NA_INT16_FILL	-999				
										MISS_INT16_FILL	-998				
										ERR_INT16_FILL	-995				
										VDNE_INT16_FILL	-993				
TlmpnadLamp	2byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**									
		Lamp	Yes	No	150	150									
		Datum													
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**			
		Lamp Temperature at Nadir	0			count	No		16-bit integer	**Name**	**Value**	**Name**	**Value**		
										NA_INT16_FILL	-999				
										MISS_INT16_FILL	-998				
										ERR_INT16_FILL	-995				
										VDNE_INT16_FILL	-993				
TradnadLamp	2byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**									
		Lamp	Yes	No	150	150									

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		Datum										
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Radiator Temperature at Nadir	0			count	No		16-bit integer	**Name**	**Value**	**Name**	**Value**
										NA_INT16_FILL	-999		
										MISS_INT16_FILL	-998		
										ERR_INT16_FILL	-995		
										VDNE_INT16_FILL	-993		
Tel1nadLamp	2byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**							
		Lamp	Yes	No	150	150							
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Electronics 1 Temperature at Nadir	0			count	No		16-bit integer	**Name**	**Value**	**Name**	**Value**
										NA_INT16_FILL	-999		
										MISS_INT16_FILL	-998		
										ERR_INT16_FILL	-995		
										VDNE_INT16_FILL	-993		
Tel2nadLamp	2byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**							
		Lamp	Yes	No	150	150							
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Electronics 2 Temperature at Nadir	0			count	No		16-bit integer	**Name**	**Value**	**Name**	**Value**
										NA_INT16_FILL	-999		
										MISS_INT16_FILL	-998		
										ERR_INT16_FILL	-995		
										VDNE_INT16_FILL	-993		
PccdTCLamp	2byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**							
		Lamp	Yes	No	150	150							
		Datum											
		Description	**Datum**	**Unscaled**	**Unscaled**	**Measurement**	**Scaled**	**Scale**	**Data**	**Fill Values**		**Legend**	

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			Offset	Valid Range Min	Valid Range Max	Units		Factor Name	Type			Entries	
		Profile of CCD	0			count	No		16-bit integer	Name	Value	Name	Value
										NA_INT16_FILL	-999		
										MISS_INT16_FILL	-998		
										ERR_INT16_FILL	-995		
										VDNE_INT16_FILL	-993		

VtecTCLamp — 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Lamp	Yes	No	150	150

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Voltage of Electronics	0			count	No		16-bit integer	Name	Value	Name	Value
								NA_INT16_FILL	-999		
								MISS_INT16_FILL	-998		
								ERR_INT16_FILL	-995		
								VDNE_INT16_FILL	-993		

CtecTCLamp — 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Lamp	Yes	No	150	150

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Electronics current	0			count	No		16-bit integer	Name	Value	Name	Value
								NA_INT16_FILL	-999		
								MISS_INT16_FILL	-998		
								ERR_INT16_FILL	-995		
								VDNE_INT16_FILL	-993		

LampData — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Lamp	Yes	No	150	150
SpectralPixel	No	No	364	364
SpatialPixel	No	No	780	780

Datum

Description	Datum	Unscaled	Unscaled	Measurement	Scaled	Scale	Data	Fill Values	Legend

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			Offset	Valid Range Min	Valid Range Max	Units		Factor Name	Type			Entries	
		Correct counts of an individual lamp image	0			count	No		32-bit floating point	Name	Value	Name	Value
										NA_FLOAT32_FILL	-999.9		
										MISS_FLOAT32_FILL	-999.8		
										ERR_FLOAT32_FILL	-999.5		
										VDNE_FLOAT32_FILL	-999.3		

		Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
QualityLamp	2byte(s)	Lamp	Yes	No	150	150

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Reliability of lamp processing	0			unitless	No		16-bit integer	Name	Value	Name	Value
								NA_INT16_FILL	-999		
								MISS_INT16_FILL	-998		
								ERR_INT16_FILL	-995		
								VDNE_INT16_FILL	-993		

		Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
QualitySolar	2byte(s)	Solar	Yes	No	63	63

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Reliability of solar processing	0			unitless	No		16-bit integer	Name	Value	Name	Value
								NA_INT16_FILL	-999		
								MISS_INT16_FILL	-998		
								ERR_INT16_FILL	-995		
								VDNE_INT16_FILL	-993		

		Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
QualityDark	2byte(s)	Dark	Yes	No	5	5

Datum

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		Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
		Reliability of dark processing	0			unitless	No		16-bit integer	Name: NA_INT16_FILL, Value: -999 Name: MISS_INT16_FILL, Value: -998 Name: ERR_INT16_FILL, Value: -995 Name: VDNE_INT16_FILL, Value: -993	Name: Value:

		Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
MedianDark	4byte(s)	Granule	Yes	No	1	1

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Median dark current	0			count	No		32-bit floating point	Name: NA_FLOAT32_FILL, Value: -999.9 Name: MISS_FLOAT32_FILL, Value: -999.8 Name: ERR_FLOAT32_FILL, Value: -999.5 Name: VDNE_FLOAT32_FILL, Value: -999.3	Name: Value:

		Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Fitness	8byte(s)	IFOV	Yes	No	105	105

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Chi-squared goodness of fit for wavelengths	0			unitless	No		64-bit floating point	Name: NA_FLOAT64_FILL, Value: -999.9 Name: MISS_FLOAT64_FILL, Value: -999.8 Name: ERR_FLOAT64_FILL, Value: -999.5 Name: VDNE_FLOAT64_FILL, Value: -999.3	Name: Value:

		Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
CompleteFlag	2byte(s)	Granule	Yes	No	1	1

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Completeness	0			unitless	No		16-bit	Name: Value:	Name: Value:

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		of solar calibration data							integer	NA_INT16_FILL MISS_INT16_FILL ERR_INT16_FILL VDNE_INT16_FILL	-999 -998 -995 -993	

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Table 2.10.2.2-2, OMPS TC Calibration SDR Product Profile – Quality Values

Name	Data Size	Dimensions
SAALamp	1byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Lamp	Yes	No	150	150

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Spacecraft within South Atlantic Anomaly during Lamp calibration (extent in percent based on Climatological data)	0			unitless	No		unsigned 8-bit char			0% <= SAA <= 10%	0
										10% < SAA <= 20%	1
										20% < SAA <= 30%	2
										30% < SAA <= 40%	3
										40% < SAA <= 50%	4
										50% < SAA <= 60%	5
										60% < SAA <= 70%	6
										70% < SAA <= 80%	7
										80% < SAA	8

Name	Data Size	Dimensions
SAASolar	1byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Solar	Yes	No	63	63

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Spacecraft within South Atlantic Anomaly during Solar calibration (extent in percent based on Climatological data)	0			unitless	No		unsigned 8-bit char			0% <= SAA <= 10%	0
										10% < SAA <= 20%	1
										20% < SAA <= 30%	2
										30% < SAA <= 40%	3
										40% < SAA <= 50%	4
										50% < SAA <= 60%	5
										60% < SAA <= 70%	6
										70% < SAA <= 80%	7
										80% < SAA	8

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SAADark — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Dark	Yes	No	5	5

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Spacecraft within South Atlantic Anomaly during Dark calibration (extent in percent based on Climatological data)	0			unitless	No		unsigned 8-bit char			0% <= SAA <= 10%	0
										10% < SAA <= 20%	1
										20% < SAA <= 30%	2
										30% < SAA <= 40%	3
										40% < SAA <= 50%	4
										50% < SAA <= 60%	5
										60% < SAA <= 70%	6
										70% < SAA <= 80%	7
										80% < SAA	8

Eclipse — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Solar	Yes	No	63	63

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Eclipse - All or part of the S/C is affected by a solar eclipse, umbra or penumbra viewing.	0			unitless	No		unsigned 8-bit char			False	0
										True	1

OccultationFlag — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Solar	Yes	No	63	63

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries

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		Occultation of the diffuser has occurred during solar observation	0			unitless	No		unsigned 8-bit char	**Name** **Value**	**Name**	**Value**	
											False	0	
											True	1	

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2.10.2.3 OMPS TC Calibration SDR HDF5 Details

Figure 2.10.2.3-1, OMPS TC Calibration SDR UML Diagram, provides the details on the content and data types of the OMPS TC Calibration SDR. These UML diagrams provide details at the granule level only. In addition to these UML diagrams, refer to Section 2.2, Sensor Data Records and Temperature Data Records HDF5 Details, Figure 2.2-1, Generalized UML Diagram for HDF5 SDR/TDR Files, for a complete UML rendering of this product.

The OMPS TC Calibration SDR within the HDF5 files can be found within the Data Products group with the group name of OMPS-TC-Cal-SDR. The aggregation and granule(s) contain the data fields listed in the UML diagrams. The corresponding HDF5 data type for each field is also provided.

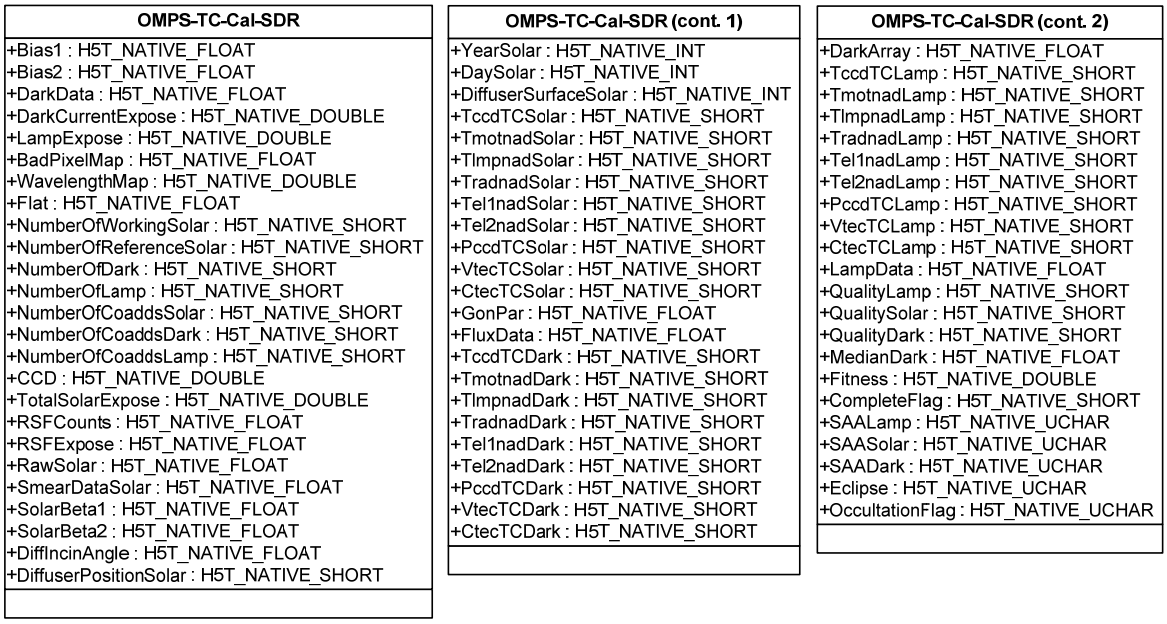

Figure 2.10.2.3-1, OMPS TC Calibration SDR UML Diagram

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2.10.2.4 OMPS TC Calibration SDR Metadata Details

The HDF5 metadata elements associated with the OMPS TC Calibration SDR are listed in the CDFCB-X Volume V, Section 4.3, HDF5 (Metadata) Hierarchy. The OMPS TC Calibration SDR metadata includes all common metadata at the root, product, aggregation, and granule levels. No summary level metadata is produced for OMPS TC Calibration SDRs.

2.10.2.5 OMPS TC Calibration SDR Geolocation Content Summary

The OMPS TC calibration SDR geolocation datasets are summarized below in Table 2.10.2.5-1 OMPS TC Calibration SDR Geolocation Content Summary.

Table 2.10.2.5-1, OMPS TC Calibration SDR Geolocation Content Summary

Name	Description	Data Type	Aggregate Dimensions	Granule Dimensions	Units
StartTime_Solar	Start time of solar frame in IET (1/1/1958)	64-bit integer	[N*63]	[63]	microsecond
MidTime_Solar	Mid-Time of solar frame in IET (1/1/1958)	64-bit integer	[N*63]	[63]	microsecond
EndTime_Solar	End time of solar frame in IET (1/1/1958)	64-bit integer	[N*63]	[63]	microsecond
Latitude_Solar	Latitude of each FOV (positive North) at MidTime_Solar	32-bit floating point	[N*63, 740]	[63, 740]	degree
Longitude_Solar	Longitude of each FOV (positive East) at MidTime_Solar	32-bit floating point	[N*63, 740]	[63, 740]	degree
MoonVector_Solar	Lunar Position in Spacecraft Coordinates at MidTime_Solar	32-bit floating point	[N*63, 3]	[63, 3]	meter
SunVector_Solar	Solar position in Spacecraft Coordinate System at MidTime_Solar	32-bit floating point	[N*63, 3]	[63, 3]	meter

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Name	Description	Data Type	Aggregate Dimensions	Granule Dimensions	Units
SCPosition_Solar	Spacecraft position in ECR Coordinates (X, Y, Z) at MidTime_Solar	32-bit floating point	[N*63, 3]	[63, 3]	meter
SCVelocity_Solar	Spacecraft velocity in ECR Coordinates (dx/dt, dy/dt, dz/dt) at MidTime_Solar	32-bit floating point	[N*63, 3]	[63, 3]	m/s
SCAttitude_Solar	Spacecraft attitude with respect to Geodetic Reference Frame Coordinates (roll, pitch, yaw) at MidTime_Solar	32-bit floating point	[N*63, 3]	[63, 3]	arcsecond
StartTime_Dark	Start time of dark frame in IET (1/1/1958)	64-bit integer	[N*5]	[5]	microsecond
MidTime_Dark	Mid-Time of dark frame in IET (1/1/1958)	64-bit integer	[N*5]	[5]	microsecond
EndTime_Dark	End time of dark frame in IET (1/1/1958)	64-bit integer	[N*5]	[5]	microsecond
Latitude_Dark	Sub-Satellite Latitude (positive North) at MidTime_Dark	32-bit floating point	[N*5, 740]	[5, 740]	degree
Longitude_Dark	Sub-Satellite Longitude (positive East) at MidTime_Dark	32-bit floating point	[N*5, 740]	[5, 740]	degree
SCPosition_Dark	Spacecraft position in ECR Coordinates (X, Y, Z) at MidTime_Dark	32-bit floating point	[N*5, 3]	[5, 3]	meter
SCVelocity_Dark	Spacecraft velocity in ECR Coordinates (dx/dt, dy/dt, dz/dt) at MidTime_Dark	32-bit floating point	[N*5, 3]	[5, 3]	m/s

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Name	Description	Data Type	Aggregate Dimensions	Granule Dimensions	Units
SCAttitude_Dark	Spacecraft attitude with respect to Geodetic Reference Frame Coordinates (roll, pitch, yaw) at MidTime_Dark	32-bit floating point	[N*5, 3]	[5, 3]	arcsecond
StartTime_Lamp	Start time of lamp frame in IET (1/1/1958)	64-bit integer	[N*150]	[150]	microsecond
MidTime_Lamp	Mid-Time of lamp frame in IET (1/1/1958)	64-bit integer	[N*150]	[150]	microsecond
EndTime_Lamp	End time of lamp frame in IET (1/1/1958)	64-bit integer	[N*150]	[150]	microsecond
Latitude_Lamp	Sub-Satellite Latitude (positive North) at MidTime_Lamp	32-bit floating point	[N*150, 740]	[150, 740]	degree
Longitude_Lamp	Sub-Satellite Longitude (positive East) at MidTime_Lamp	32-bit floating point	[N*150, 740]	[150, 740]	degree
SCPosition_Lamp	Spacecraft position in ECR Coordinates (X, Y, Z) at MidTime_Lamp	32-bit floating point	[N*150, 3]	[150, 3]	meter
SCVelocity_Lamp	Spacecraft velocity in ECR Coordinates (dx/dt, dy/dt, dz/dt) at MidTime_Lamp	32-bit floating point	[N*150, 3]	[150, 3]	m/s
SCAttitude_Lamp	Spacecraft attitude with respect to Geodetic Reference Frame Coordinates (roll, pitch, yaw) at MidTime_Lamp	32-bit floating point	[N*150, 3]	[150, 3]	arcsecond
NumberOfSolar	Actual number of solar frames (images)	16-bit integer	[N]	[1]	unitless
NumberOfDark	Actual number of dark frames (images)	16-bit integer	[N]	[1]	unitless

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Name	Description	Data Type	Aggregate Dimensions	Granule Dimensions	Units
NumberOfLamp	Actual number of lamp frames (images)	16-bit integer	[N]	[1]	unitless
QF1_GEOSOLAR	Attitude/Ephemeris availability status during Solar Calibration	unsigned 8-bit char	[N*63]	[63]	unitless
QF2_GEODARK	Attitude/Ephemeris availability status during Dark Calibration	unsigned 8-bit char	[N*5]	[5]	unitless
QF3_GEOLAMP	Attitude/Ephemeris availability status during Lamp Calibration	unsigned 8-bit char	[N*150]	[150]	unitless

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2.10.2.6 OMPS TC Calibration SDR Geolocation Product Profile

Table 2.10.2.6-1, OMPS TC Calibration SDR - Geolocation Product Profile

Fields																
Name	**Data Size**	**Dimensions**														
StartTime_Solar	8byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**										
		Solar	Yes	No	63	63										
		Datum														
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**				
		Start time of solar frame in IET (1/1/1958)	0			microsecond	No		64-bit integer	**Name**	**Value**	**Name**	**Value**			
										NA_INT64_FILL	-999					
										MISS_INT64_FILL	-998					
										ERR_INT64_FILL	-995					
										VDNE_INT64_FILL	-993					
MidTime_Solar	8byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**										
		Solar	Yes	No	63	63										
		Datum														
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**				
		Mid-Time of S solar frame in IET (1/1/1958)	0			microsecond	No		64-bit integer	**Name**	**Value**	**Name**	**Value**			
										NA_INT64_FILL	-999					
										MISS_INT64_FILL	-998					
										ERR_INT64_FILL	-995					
										VDNE_INT64_FILL	-993					
EndTime_Solar	8byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**										
		Solar	Yes	No	63	63										
		Datum														
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**				

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		End time of solar frame in IET (1/1/1958)	0			microsecond	No		64-bit integer	**Name**	**Value**	**Name**	**Value**
										NA_INT64_FILL	-999		
										MISS_INT64_FILL	-998		
										ERR_INT64_FILL	-995		
										VDNE_INT64_FILL	-993		

Latitude_Solar — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Solar	Yes	No	63	63
SpatialPixel	No	No	740	740

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Latitude of each FOV (positive North) at MidTime_Solar	0	-90	90	degree	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

Longitude_Solar — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Solar	Yes	No	63	63
SpatialPixel	No	No	740	740

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Longitude of each FOV (positive East) at MidTime_Solar	0	-180	180	degree	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

MoonVector_Solar — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Solar	Yes	No	63	63
SCCoordinate	No	No	3	3

Datum

Description	Datum Offset	Unscaled Valid Range	Unscaled Valid Range	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries

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				Min	Max							
		Lunar Position in Spacecraft Coordinates at MidTime_Solar	0			meter	No		32-bit floating point	Name: NA_FLOAT32_FILL, Value: -999.9 Name: MISS_FLOAT32_FILL, Value: -999.8 Name: ERR_FLOAT32_FILL, Value: -999.5 Name: VDNE_FLOAT32_FILL, Value: -999.3	Name	Value

SunVector_Solar — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Solar	Yes	No	63	63
SCCoordinate	No	No	3	3

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Solar position in Spacecraft Coordinate System at MidTime_Solar	0			meter	No		32-bit floating point	Name: NA_FLOAT32_FILL, Value: -999.9 Name: MISS_FLOAT32_FILL, Value: -999.8 Name: ERR_FLOAT32_FILL, Value: -999.5 Name: VDNE_FLOAT32_FILL, Value: -999.3	Name, Value

SCPosition_Solar — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Solar	Yes	No	63	63
ECRCoordinate	No	No	3	3

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Spacecraft position in ECR Coordinates (X, Y, Z) at MidTime_Solar	0			meter	No		32-bit floating point	Name: NA_FLOAT32_FILL, Value: -999.9 Name: MISS_FLOAT32_FILL, Value: -999.8 Name: ERR_FLOAT32_FILL, Value: -999.5 Name: VDNE_FLOAT32_FILL, Value: -999.3	Name, Value

SCVelocity_Solar — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Solar	Yes	No	63	63
ECRCoordinate	No	No	3	3

Datum

Description	Datum Offset	Unscaled Valid	Unscaled Valid	Measurement Units	Scaled	Scale Factor	Data Type	Fill Values	Legend Entries

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				Range Min	Range Max			Name			
		Spacecraft velocity in ECR Coordinates (dx/dt, dy/dt, dz/dt) at MidTime_Solar	0			m/s	No		32-bit floating point	Name: NA_FLOAT32_FILL, Value: -999.9 Name: MISS_FLOAT32_FILL, Value: -999.8 Name: ERR_FLOAT32_FILL, Value: -999.5 Name: VDNE_FLOAT32_FILL, Value: -999.3	Name: Value:

SCAttitude_Solar — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Solar	Yes	No	63	63
GRFCoordinate	No	No	3	3

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Spacecraft attitude with respect to Geodetic Reference Frame Coordinates (roll, pitch, yaw) at MidTime_Solar	0			arcsecond	No		32-bit floating point	Name: NA_FLOAT32_FILL, Value: -999.9 Name: MISS_FLOAT32_FILL, Value: -999.8 Name: ERR_FLOAT32_FILL, Value: -999.5 Name: VDNE_FLOAT32_FILL, Value: -999.3	Name: Value:

StartTime_Dark — 8byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Dark	Yes	No	5	5

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Start time of dark frame in IET (1/1/1958)	0			microsecond	No		64-bit integer	Name: NA_INT64_FILL, Value: -999 Name: MISS_INT64_FILL, Value: -998 Name: ERR_INT64_FILL, Value: -995 Name: VDNE_INT64_FILL, Value: -993	Name: Value:

MidTime_Dark — 8byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Dark	Yes	No	5	5

Datum

		Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
		Mid-Time of dark frame in IET (1/1/1958)	0			microsecond	No		64-bit integer	**Name**	**Value**	**Name**	**Value**
										NA_INT64_FILL	-999		
										MISS_INT64_FILL	-998		
										ERR_INT64_FILL	-995		
										VDNE_INT64_FILL	-993		

		Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
EndTime_Dark	8byte(s)	Dark	Yes	No	5	5

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
End time of dark frame in IET (1/1/1958)	0			microsecond	No		64-bit integer	**Name**	**Value**	**Name**	**Value**
								NA_INT64_FILL	-999		
								MISS_INT64_FILL	-998		
								ERR_INT64_FILL	-995		
								VDNE_INT64_FILL	-993		

		Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Latitude_Dark	4byte(s)	Dark	Yes	No	5	5
		SpatialPixel	No	No	740	740

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Sub-Satellite Latitude (positive North) at MidTime_Dark	0	-90	90	degree	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

		Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Longitude_Dark	4byte(s)	Dark	Yes	No	5	5
		SpatialPixel	No	No	740	740

Datum

Description	Datum Offset	Unscaled Valid	Unscaled Valid	Measurement Units	Scaled	Scale Factor	Data Type	Fill Values	Legend Entries

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				Range Min	Range Max			Name					
		Sub-Satellite Longitude (positive East) at MidTime_Dark	0	-180	180	degree	No		32-bit floating point	Name / Value: NA_FLOAT32_FILL -999.9; MISS_FLOAT32_FILL -999.8; ERR_FLOAT32_FILL -999.5; VDNE_FLOAT32_FILL -999.3	Name	Value

SCPosition_Dark — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Dark	Yes	No	5	5
ECRCoordinate	No	No	3	3

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Spacecraft position in ECR Coordinates (X, Y, Z) at MidTime_Dark	0			meter	No		32-bit floating point	Name / Value: NA_FLOAT32_FILL -999.9; MISS_FLOAT32_FILL -999.8; ERR_FLOAT32_FILL -999.5; VDNE_FLOAT32_FILL -999.3		Name	Value

SCVelocity_Dark — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Dark	Yes	No	5	5
ECRCoordinate	No	No	3	3

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Spacecraft velocity in ECR Coordinates (dx/dt, dy/dt, dz/dt) at MidTime_Dark	0			m/s	No		32-bit floating point	Name / Value: NA_FLOAT32_FILL -999.9; MISS_FLOAT32_FILL -999.8; ERR_FLOAT32_FILL -999.5; VDNE_FLOAT32_FILL -999.3		Name	Value

SCAttitude_Dark — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Dark	Yes	No	5	5
GRFCoordinate	No	No	3	3

Datum

Description	Datum Offset	Unscaled Valid	Unscaled Valid	Measurement Units	Scaled	Scale Factor	Data Type	Fill Values	Legend Entries

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				Range Min	Range Max			Name			
		Spacecraft attitude with respect to Geodetic Reference Frame Coordinates (roll, pitch, yaw) at MidTime_Dark	0			arcsecond	No		32-bit floating point	Name / Value NA_FLOAT32_FILL / -999.9 MISS_FLOAT32_FILL / -999.8 ERR_FLOAT32_FILL / -999.5 VDNE_FLOAT32_FILL / -999.3	Name / Value

StartTime_Lamp — 8byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Lamp	Yes	No	150	150

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Start time of lamp frame in IET (1/1/1958)	0			microsecond	No		64-bit integer	Name / Value NA_INT64_FILL / -999 MISS_INT64_FILL / -998 ERR_INT64_FILL / -995 VDNE_INT64_FILL / -993	Name / Value

MidTime_Lamp — 8byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Lamp	Yes	No	150	150

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Mid-Time of lamp frame in IET (1/1/1958)	0			microsecond	No		64-bit integer	Name / Value NA_INT64_FILL / -999 MISS_INT64_FILL / -998 ERR_INT64_FILL / -995 VDNE_INT64_FILL / -993	Name / Value

EndTime_Lamp — 8byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Lamp	Yes	No	150	150

Datum

Description	Datum Offset	Unscaled Valid	Unscaled Valid	Measurement Units	Scaled	Scale Factor	Data Type	Fill Values	Legend Entries

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				Range Min	Range Max			Name			
		End time of lamp frame in IET (1/1/1958)	0			microsecond	No		64-bit integer	Name / Value: NA_INT64_FILL -999; MISS_INT64_FILL -998; ERR_INT64_FILL -995; VDNE_INT64_FILL -993	Name / Value

Latitude_Lamp — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Lamp	Yes	No	150	150
SpatialPixel	No	No	740	740

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Latitude (positive North)	0	-90	90	degree	No		32-bit floating point	Name / Value: NA_FLOAT32_FILL -999.9; MISS_FLOAT32_FILL -999.8; ERR_FLOAT32_FILL -999.5; VDNE_FLOAT32_FILL -999.3	Name / Value

Longitude_Lamp — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Lamp	Yes	No	150	150
SpatialPixel	No	No	740	740

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Longitude (positive East)	0	-180	180	degree	No		32-bit floating point	Name / Value: NA_FLOAT32_FILL -999.9; MISS_FLOAT32_FILL -999.8; ERR_FLOAT32_FILL -999.5; VDNE_FLOAT32_FILL -999.3	Name / Value

SCPosition_Lamp — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Lamp	Yes	No	150	150
ECRCoordinate	No	No	3	3

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries

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		Spacecraft position in ECR Coordinates (X, Y, Z) at MidTime_Lamp	0			meter	No		32-bit floating point	**Name** / **Value**: NA_FLOAT32_FILL -999.9; MISS_FLOAT32_FILL -999.8; ERR_FLOAT32_FILL -999.5; VDNE_FLOAT32_FILL -999.3	**Name**	**Value**	

SCVelocity_Lamp — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Lamp	Yes	No	150	150
ECRCoordinate	No	No	3	3

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Spacecraft velocity in ECR Coordinates (dx/dt, dy/dt, dz/dt) at MidTime_Lamp	0			m/s	No		32-bit floating point	**Name** / **Value**: NA_FLOAT32_FILL -999.9; MISS_FLOAT32_FILL -999.8; ERR_FLOAT32_FILL -999.5; VDNE_FLOAT32_FILL -999.3	**Name** / **Value**

SCAttitude_Lamp — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Lamp	Yes	No	150	150
GRFCoordinate	No	No	3	3

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Spacecraft attitude with respect to Geodetic Reference Frame Coordinates (roll, pitch, yaw) at MidTime_Lamp	0			arcsecond	No		32-bit floating point	**Name** / **Value**: NA_FLOAT32_FILL -999.9; MISS_FLOAT32_FILL -999.8; ERR_FLOAT32_FILL -999.5; VDNE_FLOAT32_FILL -999.3	**Name** / **Value**

NumberOfSolar — 2byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	1	1

Datum

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		Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
		Actual number of solar frames (images)	0			unitless	No		16-bit integer	**Name**	**Value**	**Name**	**Value**
										NA_INT16_FILL	-999		
										MISS_INT16_FILL	-998		
										ERR_INT16_FILL	-995		
										VDNE_INT16_FILL	-993		
NumberOfDark	2byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**							
		Granule	Yes	No	1	1							
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Actual number of dark frames (images)	0			unitless	No		16-bit integer	**Name**	**Value**	**Name**	**Value**
										NA_INT16_FILL	-999		
										MISS_INT16_FILL	-998		
										ERR_INT16_FILL	-995		
										VDNE_INT16_FILL	-993		
NumberOfLamp	2byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**							
		Granule	Yes	No	1	1							
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Actual number of lamp frames (images)	0			unitless	No		16-bit integer	**Name**	**Value**	**Name**	**Value**
										NA_INT16_FILL	-999		
										MISS_INT16_FILL	-998		
										ERR_INT16_FILL	-995		
										VDNE_INT16_FILL	-993		

Table 2.10.2.6-2, OMPS TC Calibration SDR Geolocation Quality Flags Product Profile

Fields

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Name	Data Size	Dimensions
QF1_GEOSOLAR	1byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Solar	Yes	No	63	63

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Attitude and Ephemeris availability status	0			unitless	No		2 bit(s)			Nominal - E&A data available	0
										Missing Data <= Small Gap	1
										Small Gap < Missing Data < Granule Boundary	2
										Missing Data >= Granule Boundary	3
Spare	2			unitless	No		6 bit(s)	Name	Value	Name	Value

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Dark	Yes	No	5	5

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Attitude and Ephemeris availability status	0			unitless	No		2 bit(s)			Nominal - E&A data available	0
										Missing Data <= Small Gap	1
										Small Gap < Missing Data < Granule Boundary	2
										Missing Data >= Granule Boundary	3

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		Spare	2			unitless	No		6 bit(s)	**Name**	**Value**	**Name**	**Value**

QF3_GEOLAMP — 1byte(s)

Name	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**
Lamp	Yes	No	150	150

Datum

Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
Attitude and Ephemeris availability status	0			unitless	No		2 bit(s)	**Name**	**Value**	**Name**	**Value**
										Nominal - E&A data available	0
										Missing Data <= Small Gap	1
										Small Gap < Missing Data < Granule Boundary	2
										Missing Data >= Granule Boundary	3
Spare	2			unitless	No		6 bit(s)	**Name**	**Value**	**Name**	**Value**

2.10.2.7 OMPS TC Calibration SDR Geolocation HDF5 Details

The OMPS TC Calibration SDR Geolocation is based on a simple spatial average over the geometric cell bounds, regardless of pixel sampling. Geolocation is reported on the ellipsoid. Figure 2.10.2.7-1, OMPS TC Calibration SDR Geolocation UML Diagram, provides details on the contents and data types of the OMPS TC SDR geolocation.

OMPS-TC-Cal-GEO
+StartTime_Solar : H5T_NATIVE_LLONG +MidTime_Solar : H5T_NATIVE_LLONG +EndTime_Solar : H5T_NATIVE_LLONG +Latitude_Solar : H5T_NATIVE_FLOAT +Longitude_Solar : H5T_NATIVE_FLOAT +MoonVector_Solar : H5T_NATIVE_FLOAT +SunVector_Solar : H5T_NATIVE_FLOAT +SCPosition_Solar : H5T_NATIVE_FLOAT +SCVelocity_Solar : H5T_NATIVE_FLOAT +SCAttitude_Solar : H5T_NATIVE_FLOAT +StartTime_Dark : H5T_NATIVE_LLONG +MidTime_Dark : H5T_NATIVE_LLONG +EndTime_Dark : H5T_NATIVE_LLONG +Latitude_Dark : H5T_NATIVE_FLOAT +Longitude_Dark : H5T_NATIVE_FLOAT +SCPosition_Dark : H5T_NATIVE_FLOAT +SCVelocity_Dark : H5T_NATIVE_FLOAT +SCAttitude_Dark : H5T_NATIVE_FLOAT +StartTime_Lamp : H5T_NATIVE_LLONG +MidTime_Lamp : H5T_NATIVE_LLONG +EndTime_Lamp : H5T_NATIVE_LLONG +Latitude_Lamp : H5T_NATIVE_FLOAT +Longitude_Lamp : H5T_NATIVE_FLOAT +SCPosition_Lamp : H5T_NATIVE_FLOAT +SCVelocity_Lamp : H5T_NATIVE_FLOAT +SCAttitude_Lamp : H5T_NATIVE_FLOAT +NumberOfSolar : H5T_NATIVE_SHORT +NumbrOfDark : H5T_NATIVE_SHORT +NumberOfLamp : H5T_NATIVE_SHORT +QF1_GEOSOLAR : H5T_NATIVE_UCHAR +QF2_GEODARK : H5T_NATIVE_UCHAR +QF3_GEOLAMP : H5T_NATIVE_UCHAR

Figure 2.10.2.7-1, OMPS TC Calibration SDR Geolocation UML Diagram

2.10.2.8 OMPS TC Calibration SDR Geolocation Metadata Details

The HDF5 metadata elements associated with the OMPS TC Calibration SDR Geolocation are listed in the CDFCB-X Volume V, Section 4.3, HDF5 (Metadata) Hierarchy. There are no additional metadata elements or granule level quality flags for this geolocation.

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2.11 DELETED

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2.12 DELETED

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2.13 Search and Rescue Satellite Aided Tracking SDRs

2.13.1 Search and Rescue – Repeater SDR

Data Mnemonic (NPOESS Only)	SDRE-SARR-C0030
Description/ Purpose	Search and Rescue Repeater (SARR) housekeeping telemetry converted into engineering units. No geolocation is provided; the "SDR" is limited to containing the converted housekeeping analog and digital telemetry from the sensor, and a limited set of point to point telemetry from the spacecraft bus. Two time stamps are provided: TimePPT corresponds to the point to point telemetry packets; Time corresponds to the SARR telemetry packet. Values not present due to under-sampling are represented as fill.
File-Naming Construct	See the CDFCB-X Volume I, D34862-01, Section 3.0 for details.
File Size	109.375 KiB (640 second duration) per data Granule. Does not include HDF5 overhead.
File Format Type	HDF5
Data Content and Data Format	See Table 2.13.1.1 SARR SDR Product Data Content Summary See Table 2.13.1.2 SARR SDR Product Profile

2.13.1.1 SARR SDR Product Data Content Summary

Table 2.13.1.1-1, SARR Product Data Content Summary

Name	Description	Data Type	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
TimePPT	CCSDS Time from spacecraft bus housekeeping packet (point to point telemetry) expressed as TAI58 (IET)	64-bit integer	[N*640]	[640]	microsecond
PTCATemp	Temperature inside PT&C A unit	32-bit floating point	[N*640]	[640]	degree Celsius
PTCBTemp	Temperature inside PT&C B unit	32-bit floating point	[N*640]	[640]	degree Celsius

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Name	Description	Data Type	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
BasePlt1Temp	Temperature on SARR Baseplate, between PT&C and Tx/Rx sub-assemblies (RT2)	32-bit floating point	[N*640]	[640]	degree Celsius
BasePlt2Temp	Temperature on SARR Baseplate, between PT&C and Tx/Rx sub-assemblies (RT4)	32-bit floating point	[N*640]	[640]	degree Celsius
PPCLatchA	Status of the PPC latching relay for PT&C A (changed by PPC1 and PPC3)	unsigned 8-bit uchar	[N*640]	[640]	unitless
PPCLatchB	Status of the PPC latching relay for PT&C B (changed by PPC2 and PPC4)	unsigned 8-bit uchar	[N*640]	[640]	unitless
Time	CCSDS Time from SARR Housekeeping Packet expressed as TAI58 (IET)	64-bit integer	[N*640]	[640]	microsecond
PDSEnable	PDS Enable/Disable - Indicates if the PDS channel in selected PT&C is on or off	unsigned 8-bit uchar	[N*640]	[640]	unitless
PDS1dBAtt	PDS 1dB Attenuator - Indicates if the 1 dB pad in the active PDS channel is on (1 dB) or off (0 dB)	unsigned 8-bit uchar	[N*640]	[640]	unitless
PDS2dBAtt	PDS 2dB Attenuator - Indicates if the 2 dB pad in the active PDS channel is on (2 dB) or off (0 dB)	unsigned 8-bit uchar	[N*640]	[640]	unitless

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Name	Description	Data Type	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
PDS4dBAtt	PDS 4dB Attenuator - Indicates if the 4 dB pad in the active PDS channel is on (4 dB) or off (0 dB)	unsigned 8-bit uchar	[N*640]	[640]	unitless
PDS8dBAtt	PDS 8dB Attenuator - Indicates if the 8 dB pad in the active PDS channel is on (8 dB) or off (0 dB)	unsigned 8-bit uchar	[N*640]	[640]	unitless
RxRFSwitch	Rx Redundancy RF Switch - Indicates if the Rx RF Switch is connected to Rx A or Rx B	unsigned 8-bit uchar	[N*640]	[640]	unitless
RxAOn	Rx A On/Off - Indicates if Rx A is active or not	unsigned 8-bit uchar	[N*640]	[640]	unitless
RxBOn	Rx B On/Off - Indicates if Rx B is active or not	unsigned 8-bit uchar	[N*640]	[640]	unitless
RxAGC	Rx AGC Enabled/Disabled - Indicates if the active Rx is in AGC mode or in Fix Gain	unsigned 8-bit uchar	[N*640]	[640]	unitless
RxFreqGenLock	Rx Freq Generator Lock - Indicates if the active Rx FG is locked or out-of-lock	unsigned 8-bit uchar	[N*640]	[640]	unitless
Rx1dBAtt	Rx 1dB Attenuator - Indicates if the 1 dB pad in the active Rx is on (1 dB) or off (0 dB)	unsigned 8-bit uchar	[N*640]	[640]	unitless

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Name	Description	Data Type	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
Rx2dBAtt	Rx 2dB Attenuator - Indicates if the 2 dB pad in the active Rx is on (2 dB) or off (0 dB)	unsigned 8-bit uchar	[N*640]	[640]	unitless
Rx4dBAtt	Rx 4dB Attenuator - Indicates if the 4 dB pad in the active Rx is on (4 dB) or off (0 dB)	unsigned 8-bit uchar	[N*640]	[640]	unitless
Rx8dBAtt	Rx 8dB Attenuator - Indicates if the 8 dB pad in the active Rx is on (8 dB) or off (0 dB)	unsigned 8-bit uchar	[N*640]	[640]	unitless
TxRFSwitch	Tx Redundancy RF Switch - Indicates if the Tx RF switch is connected to Tx A or to Tx B	unsigned 8-bit uchar	[N*640]	[640]	unitless
TxOn	Tx On/Off - Indicates if Tx is on or off (Tx A if PT&C A is selected, Tx B if PT&C B is selected)	unsigned 8-bit uchar	[N*640]	[640]	unitless
TxFreqGenLock	Tx Freq Generator Lock - Indicates if Tx FG is locked or out-of-lock (Tx A if PT&C A is selected, Tx B if PT&C B is selected)	unsigned 8-bit uchar	[N*640]	[640]	unitless
TxDrvGV	Tx Driver FET Gate Voltage of the active Tx	32-bit floating point	[N*640]	[640]	V
TxDrvDV	Tx Driver FET Drain Voltage of the active Tx	32-bit floating point	[N*640]	[640]	V
TxOpGV	Tx Output FET Gate voltage of the active Tx	32-bit floating point	[N*640]	[640]	V

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Name	Description	Data Type	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
TxOpDV	Tx Output FET Drain voltage of the active Tx	32-bit floating point	[N*640]	[640]	V
TxOpT	Tx Output FET Temperature of the active Tx	32-bit floating point	[N*640]	[640]	degree Celsius
TxOpPV	Tx RF output power of the active Tx	32-bit floating point	[N*640]	[640]	W
TxUSOOT	Tx USO oven temperature of the active Tx	32-bit floating point	[N*640]	[640]	degree Celsius
TxALCV	Tx ALC voltage of the active Tx	32-bit floating point	[N*640]	[640]	V
RxAGainV	Rx gain voltage of Rx A, in either Fix Gain or AGC, when it is active.	32-bit floating point	[N*640]	[640]	V
RxBGainV	Rx gain voltage of Rx B, in either Fix Gain or AGC, when it is active	32-bit floating point	[N*640]	[640]	V
RxAUSOOT	Rx A USO oven temperature when it is active	32-bit floating point	[N*640]	[640]	degree Celsius
RxBUSOOT	Rx B USO oven temperature when it is active	32-bit floating point	[N*640]	[640]	degree Celsius
RxAUnitT	Rx A Unit temperature. Also valid when Rx A is OFF	32-bit floating point	[N*640]	[640]	degree Celsius
RxBUnitT	Rx B Unit temperature. Also valid when Rx B is OFF.	32-bit floating point	[N*640]	[640]	degree Celsius
PTCEPCC	PT&C EPC input current drawn by the +28V EPC of the active PT&C from the spacecraft	32-bit floating point	[N*640]	[640]	A

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Name	Description	Data Type	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
RxECPC	Rx EPC input current drawn by the Rx EPC located inside the active PT&C	32-bit floating point	[N*640]	[640]	A
TxECPC	Tx EPC input current drawn by the Tx EPC located inside the active PT&C	32-bit floating point	[N*640]	[640]	A
SARR28V	AT18 +28V Main Bus Voltage - The +28V input bus voltage from the spacecraft to the active PT&C	32-bit floating point	[N*640]	[640]	V
TCEPC28V	PT&C EPC +28V Reg. Voltage - Internally regulated +28V volt from the active PT&C	32-bit floating point	[N*640]	[640]	V
TxEPC9V	Tx EPC +9V output voltage from the Tx EPC that is used to drive Tx RF circuits	32-bit floating point	[N*640]	[640]	V
TxEPC8V	Tx EPC +8V output voltage from the Tx EPC that is used to drive Tx RF circuits	32-bit floating point	[N*640]	[640]	V
TxEPCMinus8V	Tx EPC –8V output voltage from the Tx EPC that is used to drive Tx RF circuits	32-bit floating point	[N*640]	[640]	V
TxEPCFG15V	Tx EPC +15V (FG) Output Voltage from the Tx EPC that is used to drive Tx FG circuits	32-bit floating point	[N*640]	[640]	V

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Name	Description	Data Type	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
TxEPCUSO15V	Tx EPC +15V (USO) output voltage that is used to drive Tx USO circuits including the crystal oven	32-bit floating point	[N*640]	[640]	V
RxEPC8V	Rx EPC +8V output voltage from the Rx EPC that is used to drive RF circuits in either RxA or RxB, as selected.	32-bit floating point	[N*640]	[640]	V
RxEPCMinus8V	Rx EPC –8V output voltage from the Rx EPC that is used to drive RF circuits in either RxA or RxB, as selected	32-bit floating point	[N*640]	[640]	V
RxEPCFG15V	Rx EPC +15V (FG) output voltage from the Rx EPC that is used to drive FG circuits in either RxA or RxB, as selected	32-bit floating point	[N*640]	[640]	V
RxEPCUSO15V	Rx EPC +15V (USO) output voltage from the Rx EPC that is used to drive USO circuits including the crystal oven, in either RxA or RxB, as selected	32-bit floating point	[N*640]	[640]	V
PTCVREF	Thermistor Ref. voltage used for all 1553 temperature measurement within the SARR	32-bit floating point	[N*640]	[640]	V

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Name	Description	Data Type	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
PTCTemp	Tx EPC temperature at Tx EPC inside the corresponding PT&C	32-bit floating point	[N*640]	[640]	degree Celsius
SARRTemp	SARR baseplate temperature between PT&C(s) and Tx/Rx sub-assemblies (Refer to RT1 & RT3)	32-bit floating point	[N*640]	[640]	degree Celsius

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2.13.1.2 SARR SDR Product Profile

Table 2.13.1.2-1, SARR SDR Product Profile

Fields

Name	Data Size	Dimensions
TimePPT	8byte(s)	
PTCATemp	4byte(s)	
PTCBTemp	4byte(s)	

TimePPT — Dimensions

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
PacketsPerGranule	Yes	No	640	640

TimePPT — Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
CCSDS Time from spacecraft bus housekeeping packet (point to point telemetry) expressed as TAI58 (IET)	0			microsecond	No		64-bit integer	NA_INT64_FILL	-999.9		
								MISS_INT64_FILL	-999.8		
								ERR_INT64_FILL	-999.5		
								VDNE_INT64_FILL	-999.3		

PTCATemp — Dimensions

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
PacketsPerGranule	Yes	No	640	640

PTCATemp — Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Temperature inside PT&C A unit	0			degree Celsius	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

PTCBTemp — Dimensions

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
PacketsPerGranule	Yes	No	640	640

PTCBTemp — Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Temperature inside PT&C B unit	0			degree Celsius	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		

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										MISS_FLOAT32_FILL	-999.8	
										ERR_FLOAT32_FILL	-999.5	
										VDNE_FLOAT32_FILL	-999.3	

BasePlt1Temp — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
PacketsPerGranule	Yes	No	640	640

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Temperature on SARR Baseplate, between PT&C and Tx/Rx sub-assemblies (RT2)	0			degree Celsius	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

BasePlt2Temp — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
PacketsPerGranule	Yes	No	640	640

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Temperature on SARR Baseplate, between PT&C and Tx/Rx sub-assemblies (RT4)	0			degree Celsius	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

PPCLatchA — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
PacketsPerGranule	Yes	No	640	640

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries

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		Status of the PPC latching relay for PT&C A (changed by PPC1 and PPC3)	0			unitless	No		unsigned 8-bit uchar	**Name**	**Value**	**Name**	**Value**
										NA_UINT8_FILL	255		
										MISS_UINT8_FILL	254		
										ERR_UINT8_FILL	251		
										VDNE_UINT8_FILL	249		

PPCLatchB	1byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**							
		PacketsPerGranule	Yes	No	640	640							
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Status of the PPC latching relay for PT&C B (changed by PPC2 and PPC4)	0			unitless	No		unsigned 8-bit uchar	**Name**	**Value**	**Name**	**Value**
										NA_UINT8_FILL	255		
										MISS_UINT8_FILL	254		
										ERR_UINT8_FILL	251		
										VDNE_UINT8_FILL	249		

Time	8byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**							
		PacketsPerGranule	Yes	No	640	640							
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		CCSDS Time from SARR Housekeeping Packet expressed as TAI58 (IET)	0			microsecond	No		64-bit integer	**Name**	**Value**	**Name**	**Value**
										NA_INT64_FILL	-999.9		
										MISS_INT64_FILL	-999.8		
										ERR_INT64_FILL	-999.5		
										VDNE_INT64_FILL	-999.3		

PDSEnable	1byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**							
		PacketsPerGranule	Yes	No	640	640							
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		PDS Enable/Disable - Indicates if the PDS channel in	0			unitless	No		unsigned 8-bit uchar	**Name**	**Value**	**Name**	**Value**
										NA_UINT8_FILL	255	Disabled	0
										MISS_UINT8_FILL	254	Enabled	1

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		selected PT&C is on or off								ERR_UINT8_FILL VDNE_UINT8_FILL	251 249	

PDS1dBAtt — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
PacketsPerGranule	Yes	No	640	640

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
PDS 1dB Attenuator - Indicates if the 1 dB pad in the active PDS channel is on (1 dB) or off (0 dB)	0			unitless	No		unsigned 8-bit uchar	**Name**	**Value**	**Name**	**Value**
								NA_UINT8_FILL	255	Off	0
								MISS_UINT8_FILL	254	On	1
								ERR_UINT8_FILL	251		
								VDNE_UINT8_FILL	249		

PDS2dBAtt — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
PacketsPerGranule	Yes	No	640	640

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
PDS 2dB Attenuator - Indicates if the 2 dB pad in the active PDS channel is on (2 dB) or off (0 dB)	0			unitless	No		unsigned 8-bit uchar	**Name**	**Value**	**Name**	**Value**
								NA_UINT8_FILL	255	Off	0
								MISS_UINT8_FILL	254	On	1
								ERR_UINT8_FILL	251		
								VDNE_UINT8_FILL	249		

PDS4dBAtt — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
PacketsPerGranule	Yes	No	640	640

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
PDS 4dB Attenuator - Indicates if the 4 dB pad in the active PDS channel is on (4 dB) or off (0 dB)	0			unitless	No		unsigned 8-bit uchar	**Name**	**Value**	**Name**	**Value**
								NA_UINT8_FILL	255	Off	0
								MISS_UINT8_FILL	254	On	1
								ERR_UINT8_FILL	251		
								VDNE_UINT8_FILL	249		

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PDS8dBAtt — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
PacketsPerGranule	Yes	No	640	640

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
PDS 8dB Attenuator - Indicates if the 8 dB pad in the active PDS channel is on (8 dB) or off (0 dB)	0			unitless	No		unsigned 8-bit uchar	**Name**	**Value**	**Name**	**Value**
								NA_UINT8_FILL	255	Off	0
								MISS_UINT8_FILL	254	On	1
								ERR_UINT8_FILL	251		
								VDNE_UINT8_FILL	249		

RxRFSwitch — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
PacketsPerGranule	Yes	No	640	640

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Rx Redundancy RF Switch - Indicates if the Rx RF Switch is connected to Rx A or Rx B	0			unitless	No		unsigned 8-bit uchar	**Name**	**Value**	**Name**	**Value**
								NA_UINT8_FILL	255	Rx A	0
								MISS_UINT8_FILL	254	Rx B	1
								ERR_UINT8_FILL	251		
								VDNE_UINT8_FILL	249		

RxAOn — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
PacketsPerGranule	Yes	No	640	640

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Rx A On/Off - Indicates if Rx A is active or not	0			unitless	No		unsigned 8-bit uchar	**Name**	**Value**	**Name**	**Value**
								NA_UINT8_FILL	255	Rx A is Off	0
								MISS_UINT8_FILL	254		
								ERR_UINT8_FILL	251	Rx A is on	1
								VDNE_UINT8_FILL	249		

RxBOn — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
PacketsPerGranule	Yes	No	640	640

Datum

		Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
		Rx B On/Off - Indicates if Rx B is active or not	0			unitless	No		unsigned 8-bit uchar	**Name**	**Value**	**Name**	**Value**
										NA_UINT8_FILL	255	Rx B is Off	0
										MISS_UINT8_FILL	254		
										ERR_UINT8_FILL	251	Rx B is on	1
										VDNE_UINT8_FILL	249		

		Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
RxAGC	1byte(s)	PacketsPerGranule	Yes	No	640	640

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Rx AGC Enabled/Disabled - Indicates if the active Rx is in AGC mode or in Fix Gain	0			unitless	No		unsigned 8-bit uchar	**Name**	**Value**	**Name**	**Value**
								NA_UINT8_FILL	255	AGC Mode	0
								MISS_UINT8_FILL	254		
								ERR_UINT8_FILL	251	Fix Gain	1
								VDNE_UINT8_FILL	249		

		Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
RxFreqGenLock	1byte(s)	PacketsPerGranule	Yes	No	640	640

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Rx Freq Generator Lock - Indicates if the active Rx FG is locked or out-of-lock	0			unitless	No		unsigned 8-bit uchar	**Name**	**Value**	**Name**	**Value**
								NA_UINT8_FILL	255	Locked	0
								MISS_UINT8_FILL	254	Out-of-lock	1
								ERR_UINT8_FILL	251		
								VDNE_UINT8_FILL	249		

		Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Rx1dBAtt	1byte(s)	PacketsPerGranule	Yes	No	640	640

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries

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		Rx 1dB Attenuator - Indicates if the 1 dB pad in the active Rx is on (1 dB) or off (0 dB)	0			unitless	No		unsigned 8-bit uchar	**Name**	**Value**	**Name**	**Value**
										NA_UINT8_FILL	255	Off	0
										MISS_UINT8_FILL	254	On	1
										ERR_UINT8_FILL	251		
										VDNE_UINT8_FILL	249		
Rx2dBAtt	1byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**							
		PacketsPerGranule	Yes	No	640	640							
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Rx 2dB Attenuator - Indicates if the 2 dB pad in the active Rx is on (2 dB) or off (0 dB)	0			unitless	No		unsigned 8-bit uchar	**Name**	**Value**	**Name**	**Value**
										NA_UINT8_FILL	255	Off	0
										MISS_UINT8_FILL	254	On	1
										ERR_UINT8_FILL	251		
										VDNE_UINT8_FILL	249		
Rx4dBAtt	1byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**							
		PacketsPerGranule	Yes	No	640	640							
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Rx 4dB Attenuator - Indicates if the 4 dB pad in the active Rx is on (4 dB) or off (0 dB)	0			unitless	No		unsigned 8-bit uchar	**Name**	**Value**	**Name**	**Value**
										NA_UINT8_FILL	255	Off	0
										MISS_UINT8_FILL	254	On	1
										ERR_UINT8_FILL	251		
										VDNE_UINT8_FILL	249		
Rx8dBAtt	1byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**							
		PacketsPerGranule	Yes	No	640	640							
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Rx 8dB Attenuator - Indicates if the 8 dB pad in the active Rx is on (8 dB) or off (0 dB)	0			unitless	No		unsigned 8-bit uchar	**Name**	**Value**	**Name**	**Value**
										NA_UINT8_FILL	255	Off	0
										MISS_UINT8_FILL	254	On	1
										ERR_UINT8_FILL	251		

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											VDNE_UINT8_FILL	249	

TxRFSwitch — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
PacketsPerGranule	Yes	No	640	640

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Tx Redundancy RF Switch - Indicates if the Tx RF switch is connected to Tx A or to Tx B	0			unitless	No		unsigned 8-bit uchar	**Name**	**Value**	**Name**	**Value**
								NA_UINT8_FILL	255	Tx A	0
								MISS_UINT8_FILL	254	Tx B	1
								ERR_UINT8_FILL	251		
								VDNE_UINT8_FILL	249		

TxOn — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
PacketsPerGranule	Yes	No	640	640

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Tx On/Off - Indicates if Tx is on or off (Tx A if PT&C A is selected, Tx B if PT&C B is selected)	0			unitless	No		unsigned 8-bit uchar	**Name**	**Value**	**Name**	**Value**
								NA_UINT8_FILL	255	Off	0
								MISS_UINT8_FILL	254	On	1
								ERR_UINT8_FILL	251		
								VDNE_UINT8_FILL	249		

TxFreqGenLock — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
PacketsPerGranule	Yes	No	640	640

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Tx Freq Generator Lock - Indicates if Tx FG is locked or out-of-lock (Tx A if PT&C A is selected, Tx B if PT&C B is selected)	0			unitless	No		unsigned 8-bit uchar	**Name**	**Value**	**Name**	**Value**
								NA_UINT8_FILL	255	locked	0
								MISS_UINT8_FILL	254	out-of-lock	1
								ERR_UINT8_FILL	251		
								VDNE_UINT8_FILL	249		

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TxDrvGV	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**									
		PacketsPerGranule	Yes	No	640	640									
		Datum													
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**			
		Tx Driver FET Gate Voltage of the active Tx	0			V	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**		
										NA_FLOAT32_FILL	-999.9				
										MISS_FLOAT32_FILL	-999.8				
										ERR_FLOAT32_FILL	-999.5				
										VDNE_FLOAT32_FILL	-999.3				
TxDrvDV	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**									
		PacketsPerGranule	Yes	No	640	640									
		Datum													
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**			
		Tx Driver FET Drain Voltage of the active Tx	0			V	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**		
										NA_FLOAT32_FILL	-999.9				
										MISS_FLOAT32_FILL	-999.8				
										ERR_FLOAT32_FILL	-999.5				
										VDNE_FLOAT32_FILL	-999.3				
TxOpGV	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**									
		PacketsPerGranule	Yes	No	640	640									
		Datum													
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**			
		Tx Output FET Gate voltage of the active Tx	0			V	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**		
										NA_FLOAT32_FILL	-999.9				
										MISS_FLOAT32_FILL	-999.8				
										ERR_FLOAT32_FILL	-999.5				
										VDNE_FLOAT32_FILL	-999.3				
TxOpDV	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**									
		PacketsPerGranule	Yes	No	640	640									
		Datum													
		Description	**Datum**	**Unscaled**	**Unscaled**	**Measurement**	**Scaled**	**Scale**	**Data**	**Fill Values**		**Legend**			

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			Offset	Valid Range Min	Valid Range Max	Units		Factor Name	Type			Entries	
		Tx Output FET Drain voltage of the active Tx	0			V	No		32-bit floating point	Name	Value	Name	Value
										NA_FLOAT32_FILL	-999.9		
										MISS_FLOAT32_FILL	-999.8		
										ERR_FLOAT32_FILL	-999.5		
										VDNE_FLOAT32_FILL	-999.3		

		Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
TxOpT	4byte(s)	PacketsPerGranule	Yes	No	640	640

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Tx Output FET Temperature of the active Tx	0			degree Celsius	No		32-bit floating point	Name	Value	Name	Value
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

		Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
TxOpPV	4byte(s)	PacketsPerGranule	Yes	No	640	640

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Tx RF output power of the active Tx	0			W	No		32-bit floating point	Name	Value	Name	Value
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

		Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
TxUSOOT	4byte(s)	PacketsPerGranule	Yes	No	640	640

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Tx USO oven temperature of the active Tx	0			degree Celsius	No		32-bit floating point	Name	Value	Name	Value
								NA_FLOAT32_FILL	-999.9		

											MISS_FLOAT32_FILL	-999.8	
											ERR_FLOAT32_FILL	-999.5	
											VDNE_FLOAT32_FILL	-999.3	
TxALCV	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**							
		PacketsPerGranule	Yes	No	640	640							
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Tx ALC voltage of the active Tx	0			V	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
										NA_FLOAT32_FILL	-999.9		
										MISS_FLOAT32_FILL	-999.8		
										ERR_FLOAT32_FILL	-999.5		
										VDNE_FLOAT32_FILL	-999.3		
RxAGainV	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**							
		PacketsPerGranule	Yes	No	640	640							
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Rx gain voltage of Rx A, in either Fix Gain or AGC, when it is active.	0			V	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
										NA_FLOAT32_FILL	-999.9		
										MISS_FLOAT32_FILL	-999.8		
										ERR_FLOAT32_FILL	-999.5		
										VDNE_FLOAT32_FILL	-999.3		
RxBGainV	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**							
		PacketsPerGranule	Yes	No	640	640							
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Rx gain voltage of Rx B, in either Fix Gain or AGC, when it is active	0			V	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
										NA_FLOAT32_FILL	-999.9		
										MISS_FLOAT32_FILL	-999.8		
										ERR_FLOAT32_FILL	-999.5		
										VDNE_FLOAT32_FILL	-999.3		

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RxAUSOOT	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**									
		PacketsPerGranule	Yes	No	640	640									
		Datum													
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**			
		Rx A USO oven temperature when it is active	0			degree Celsius	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**		
										NA_FLOAT32_FILL	-999.9				
										MISS_FLOAT32_FILL	-999.8				
										ERR_FLOAT32_FILL	-999.5				
										VDNE_FLOAT32_FILL	-999.3				
RxBUSOOT	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**									
		PacketsPerGranule	Yes	No	640	640									
		Datum													
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**			
		Rx B USO oven temperature when it is active	0			degree Celsius	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**		
										NA_FLOAT32_FILL	-999.9				
										MISS_FLOAT32_FILL	-999.8				
										ERR_FLOAT32_FILL	-999.5				
										VDNE_FLOAT32_FILL	-999.3				
RxAUnitT	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**									
		PacketsPerGranule	Yes	No	640	640									
		Datum													
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**			
		Rx A Unit temperature. Also valid when Rx A is OFF	0			degree Celsius	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**		
										NA_FLOAT32_FILL	-999.9				
										MISS_FLOAT32_FILL	-999.8				
										ERR_FLOAT32_FILL	-999.5				
										VDNE_FLOAT32_FILL	-999.3				
RxBUnitT	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**									
		PacketsPerGranule	Yes	No	640	640									
		Datum													
		Description	**Datum**	**Unscaled**	**Unscaled**	**Measurement**	**Scaled**	**Scale**	**Data**	**Fill Values**		**Legend**			

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			Offset	Valid Range Min	Valid Range Max	Units		Factor Name	Type			Entries	
		Rx B Unit temperature. Also valid when Rx B is OFF.	0			degree Celsius	No		32-bit floating point	Name	Value	Name	Value
										NA_FLOAT32_FILL	-999.9		
										MISS_FLOAT32_FILL	-999.8		
										ERR_FLOAT32_FILL	-999.5		
										VDNE_FLOAT32_FILL	-999.3		

		Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
PTCEPCC	4byte(s)	PacketsPerGranule	Yes	No	640	640

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
PT&C EPC input current drawn by the +28V EPC of the active PT&C from the spacecraft	0			A	No		32-bit floating point	Name	Value	Name	Value
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

		Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
RxECPC	4byte(s)	PacketsPerGranule	Yes	No	640	640

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Rx EPC input current drawn by the Rx EPC located inside the active PT&C	0			A	No		32-bit floating point	Name	Value	Name	Value
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

		Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
TxECPC	4byte(s)	PacketsPerGranule	Yes	No	640	640

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries

		Tx EPC input current drawn by the Tx EPC located inside the active PT&C	0			A	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
										NA_FLOAT32_FILL	-999.9		
										MISS_FLOAT32_FILL	-999.8		
										ERR_FLOAT32_FILL	-999.5		
										VDNE_FLOAT32_FILL	-999.3		
SARR28V	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**							
		PacketsPerGranule	Yes	No	640	640							
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		AT18 +28V Main Bus Voltage - The +28V input bus voltage from the spacecraft to the active PT&C	0			V	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
										NA_FLOAT32_FILL	-999.9		
										MISS_FLOAT32_FILL	-999.8		
										ERR_FLOAT32_FILL	-999.5		
										VDNE_FLOAT32_FILL	-999.3		
TCEPC28V	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**							
		PacketsPerGranule	Yes	No	640	640							
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		PT&C EPC +28V Reg. Voltage - Internally regulated +28V volt from the active PT&C	0			V	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
										NA_FLOAT32_FILL	-999.9		
										MISS_FLOAT32_FILL	-999.8		
										ERR_FLOAT32_FILL	-999.5		
										VDNE_FLOAT32_FILL	-999.3		
TxEPC9V	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**							
		PacketsPerGranule	Yes	No	640	640							
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Tx EPC +9V output voltage	0			V	No		32-bit floating	**Name**	**Value**	**Name**	**Value**

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		from the Tx EPC that is used to drive Tx RF circuits							point	NA_FLOAT32_FILL MISS_FLOAT32_FILL ERR_FLOAT32_FILL VDNE_FLOAT32_FILL	-999.9 -999.8 -999.5 -999.3	
TxEPC8V	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**						
		PacketsPerGranule	Yes	No	640	640						
		Datum										
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**
		Tx EPC +8V output voltage from the Tx EPC that is used to drive Tx RF circuits	0			V	No		32-bit floating point	**Name** NA_FLOAT32_FILL MISS_FLOAT32_FILL ERR_FLOAT32_FILL VDNE_FLOAT32_FILL	**Value** -999.9 -999.8 -999.5 -999.3	**Name** **Value**
TxEPCMinus8V	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**						
		PacketsPerGranule	Yes	No	640	640						
		Datum										
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**
		Tx EPC –8V output voltage from the Tx EPC that is used to drive Tx RF circuits	0			V	No		32-bit floating point	**Name** NA_FLOAT32_FILL MISS_FLOAT32_FILL ERR_FLOAT32_FILL VDNE_FLOAT32_FILL	**Value** -999.9 -999.8 -999.5 -999.3	**Name** **Value**
TxEPCFG15V	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**						
		PacketsPerGranule	Yes	No	640	640						
		Datum										
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**
		Tx EPC +15V (FG) Output Voltage from the	0			V	No		32-bit floating point	**Name** NA_FLOAT32_FILL	**Value** -999.9	**Name** **Value**

		Tx EPC that is used to drive Tx FG circuits								MISS_FLOAT32_FILL ERR_FLOAT32_FILL VDNE_FLOAT32_FILL	-999.8 -999.5 -999.3	
TxEPCUSO15V	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**						
		PacketsPerGranule	Yes	No	640	640						
		Datum										
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**
		Tx EPC +15V (USO) output voltage that is used to drive Tx USO circuits including the crystal oven	0			V	No		32-bit floating point	**Name** NA_FLOAT32_FILL MISS_FLOAT32_FILL ERR_FLOAT32_FILL VDNE_FLOAT32_FILL	**Value** -999.9 -999.8 -999.5 -999.3	**Name** **Value**
RxEPC8V	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**						
		PacketsPerGranule	Yes	No	640	640						
		Datum										
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**
		Rx EPC +8V output voltage from the Rx EPC that is used to drive RF circuits in either RxA or RxB, as selected.	0			V	No		32-bit floating point	**Name** NA_FLOAT32_FILL MISS_FLOAT32_FILL ERR_FLOAT32_FILL VDNE_FLOAT32_FILL	**Value** -999.9 -999.8 -999.5 -999.3	**Name** **Value**
RxEPCMinus8V	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**						
		PacketsPerGranule	Yes	No	640	640						
		Datum										
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**
		Rx EPC –8V output voltage from the Rx EPC that is used to drive RF circuits in	0			V	No		32-bit floating point	**Name** NA_FLOAT32_FILL MISS_FLOAT32_FILL	**Value** -999.9 -999.8	**Name** **Value**

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		either RxA or RxB, as selected								ERR_FLOAT32_FILL VDNE_FLOAT32_FILL	-999.5 -999.3	
RxEPCFG15V	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**						
		PacketsPerGranule	Yes	No	640	640						
		Datum										
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**
		Rx EPC +15V (FG) output voltage from the Rx EPC that is used to drive FG circuits in either RxA or RxB, as selected	0			V	No		32-bit floating point	**Name** NA_FLOAT32_FILL MISS_FLOAT32_FILL ERR_FLOAT32_FILL VDNE_FLOAT32_FILL	**Value** -999.9 -999.8 -999.5 -999.3	**Name** **Value**
RxEPCUSO15V	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**						
		PacketsPerGranule	Yes	No	640	640						
		Datum										
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**
		Rx EPC +15V (USO) output voltage from the Rx EPC that is used to drive USO circuits including the crystal oven, in either RxA or RxB, as selected	0			V	No		32-bit floating point	**Name** NA_FLOAT32_FILL MISS_FLOAT32_FILL ERR_FLOAT32_FILL VDNE_FLOAT32_FILL	**Value** -999.9 -999.8 -999.5 -999.3	**Name** **Value**
PTCVREF	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**						
		PacketsPerGranule	Yes	No	640	640						
		Datum										
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**
		Thermistor Ref. voltage used for all	0			V	No		32-bit floating	**Name** NA_FLOAT32_FILL	**Value** -999.9	**Name** **Value**

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		1553 temperature measurement within the SARR							point	MISS_FLOAT32_FILL ERR_FLOAT32_FILL VDNE_FLOAT32_FILL	-999.8 -999.5 -999.3	
PTCTemp	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**						
		PacketsPerGranule	Yes	No	640	640						
		Datum										
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**
		Tx EPC temperature at Tx EPC inside the corresponding PT&C	0			degree Celsius	No		32-bit floating point	**Name** NA_FLOAT32_FILL MISS_FLOAT32_FILL ERR_FLOAT32_FILL VDNE_FLOAT32_FILL	**Value** -999.9 -999.8 -999.5 -999.3	**Name** **Value**
SARRTemp	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**						
		PacketsPerGranule	Yes	No	640	640						
		Datum										
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**
		SARR baseplate temperature between PT&C(s) and Tx/Rx sub-assemblies (Refer to RT1 & RT3)	0			degree Celsius	No		32-bit floating point	**Name** NA_FLOAT32_FILL MISS_FLOAT32_FILL ERR_FLOAT32_FILL VDNE_FLOAT32_FILL	**Value** -999.9 -999.8 -999.5 -999.3	**Name** **Value**

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2.13.1.3 SARR SDR HDF5 Details

Figure 2.13.1.3-1 provides the details on the content and data types of the SARR SDR. This UML diagram provides details at the product level only. In addition to this UML diagram, refer to Figure 2.2-1, Generalized UML Diagram for HDF5 SDR/TDR Files, for a complete UML rendering of this product.

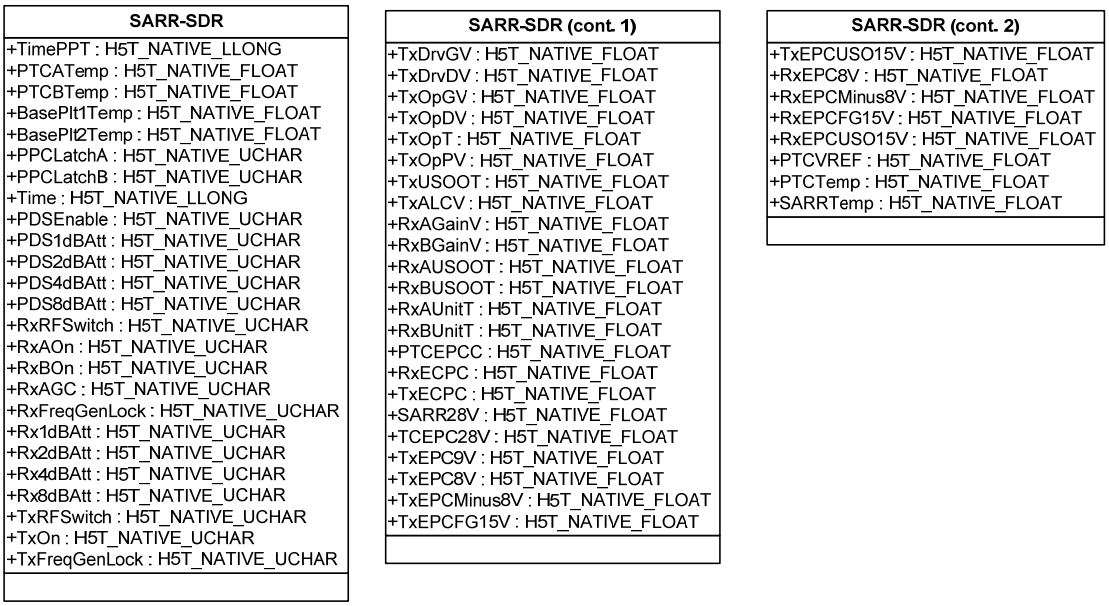

Figure 2.13.1.3-1, SARR SDR UML Diagram

2.13.1.4 SARR SDR Metadata Details

The HDF5 metadata elements associated with the SARR SDR are listed in the CDFCB-X Volume V, Section 4.3, HDF5 (Metadata) Hierarchy. The SARR SDR metadata includes most common metadata attributes at the root, product, aggregation, and Granule level with the exception of geolocation attributes, such as Zenith and Azimuth Angles, G-Ring values, and Bounding Coordinates.

The SARR SDR does not contain any Quality Summary Metadata Values.

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2.13.2 Search and Rescue – Processor SDR

Data Mnemonic (NPOESS Only)	SDRE-SARP-C0030
Description/ Purpose	Search and Rescue Processor (SARP) housekeeping telemetry converted into engineering units. No geolocation is provided; the "SDR" is limited to containing the converted housekeeping analog and digital telemetry. Values not present due to under-sampling are represented as fill.
File-Naming Construct	See the CDFCB-X Volume I, D34862-01, Section 3.0 for details.
File Size	3160 Bytes (640 second duration) per data Granule. Does not include HDF5 overhead.
File Format Type	HDF5
Data Content and Data Format	See Table 2.13.2.1-1 SARP SDR Data Content Summary See Table 2.13.2.2-1 SARP SDR Product Profile

2.13.2.1 SARP SDR Product Data Content Summary

Table 2.13.2.1-1, SARP Data Content Summary

Name	Description	Data Type	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
Time	CCSDS Time from the SARP housekeeping packet expressed as TAI58 (IET)	64-bit integer	[N*40]	[40]	microsecond
RxPowerSideCmd	RX Power Select Side - State of RX power supply relay command	unsigned 8-bit uchar	[N*40]	[40]	unitless
RxAntennaSideCmd	RX Antenna Select Side - State of RX antenna relay command	unsigned 8-bit uchar	[N*40]	[40]	unitless
Rx1PowerOff	RX1 On / Off - State of RX1 power switch command	unsigned 8-bit uchar	[N*40]	[40]	unitless

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Name	Description	Data Type	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
Rx2PowerOff	RX2 On / Off - State of RX2 power switch command	unsigned 8-bit uchar	[N*40]	[40]	unitless
TCLevelCmd	TC_LEVEL command received (data 0)	unsigned 8-bit uchar	[N*40]	[40]	unitless
DT06	Not used (data 1)	unsigned 8-bit uchar	[N*40]	[40]	unitless
MajorSoftwareFailure	Major software failure (data 2)	unsigned 8-bit uchar	[N*40]	[40]	unitless
MemoryFailure	Memory failure (data 3)	unsigned 8-bit uchar	[N*40]	[40]	unitless
WatchdogTimeout	Watchdog timeout (data 4)	unsigned 8-bit uchar	[N*40]	[40]	unitless
MinorSoftwareFailure	Minor software failure (data 5)	unsigned 8-bit uchar	[N*40]	[40]	unitless
UGSoftwareMode	UG software mode (data 6)	unsigned 8-bit uchar	[N*40]	[40]	unitless
MajorSETError	Processor failure - Major SET error (data 7)	unsigned 8-bit uchar	[N*40]	[40]	unitless
DT13	Status SARP Spare 0	unsigned 8-bit uchar	[N*40]	[40]	unitless
DT14	Status SARP Spare 1	unsigned 8-bit uchar	[N*40]	[40]	unitless
DT15	Status SARP Spare 2	unsigned 8-bit uchar	[N*40]	[40]	unitless
RPUTemp	SARP RPU Temperature when 28 V analog TLM Bus is available	32-bit floating point	[N*40]	[40]	degree Celsius
AT02	SARP Temperature Spare 0	32-bit floating point	[N*40]	[40]	n/a
AT03	SARP Temperature Spare 1	32-bit floating point	[N*40]	[40]	n/a
AT04	SARP Temperature Spare 2	32-bit floating point	[N*40]	[40]	n/a

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Name	Description	Data Type	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
RPU5V	SARP RPU +5V	32-bit floating point	[N*40]	[40]	V
RPUMinus5V	SARP RPU -5V	32-bit floating point	[N*40]	[40]	V
RPU12V	SARP RPU +12V	32-bit floating point	[N*40]	[40]	V
RPUMinus12V	SARP RPU -12V	32-bit floating point	[N*40]	[40]	V
OCXOOvenCurrent	SARP OCXO Oven Current	32-bit floating point	[N*40]	[40]	V
OCXOOutputLevel	SARP OCXO Output Level	32-bit floating point	[N*40]	[40]	mW
AT11	SARP Voltage Spare 0	32-bit floating point	[N*40]	[40]	n/a
AT12	SARP Voltage Spare 1	32-bit floating point	[N*40]	[40]	n/a
AT13	SARP Voltage Spare 2	32-bit floating point	[N*40]	[40]	n/a
RPUConverterTemp	SARP RPU Converter Temperature	32-bit floating point	[N*40]	[40]	degree Celsius

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2.13.2.2 SARP SDR Product Profile

Table 2.13.2.2-1, SARP SDR Product Profile

Fields

Name	Data Size	Dimensions
Time	8byte(s)	
RxPowerSideCmd	1byte(s)	
RxAntennaSideCmd	1byte(s)	
Rx1PowerOff	1byte(s)	

Time

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
PacketsPerGranule	Yes	No	40	40

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
CCSDS Time from the SARP housekeeping packet expressed as TAI58 (IET)	0			unitless	No		64-bit integer	NA_INT64_FILL	-999.9		
								MISS_INT64_FILL	-999.8		
								ERR_INT64_FILL	-999.5		
								VDNE_INT64_FILL	-999.3		

RxPowerSideCmd

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
PacketsPerGranule	Yes	No	40	40

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
RX Power Select Side - State of RX power supply relay command	0			unitless	No		unsigned 8-bit uchar	NA_UINT8_FILL	255	Side 1 (RX 1)	0
								MISS_UINT8_FILL	254		
								ERR_UINT8_FILL	251	Side 2 (RX 2)	1
								VDNE_UINT8_FILL	249		

RxAntennaSideCmd

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
PacketsPerGranule	Yes	No	40	40

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
RX Antenna Select Side - State of RX antenna relay command	0			unitless	No		unsigned 8-bit uchar	NA_UINT8_FILL	255	Side 1 (RX 1)	0
								MISS_UINT8_FILL	254		
								ERR_UINT8_FILL	251	Side 2 (RX 2)	1
								VDNE_UINT8_FILL	249		

Rx1PowerOff

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size

		PacketsPerGranule	Yes	No	40	40

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
RX1 On / Off - State of RX1 power switch command	0			unitless	No		unsigned 8-bit uchar	**Name**	**Value**	**Name**	**Value**
								NA_UINT8_FILL	255	On	0
								MISS_UINT8_FILL	254	Off	1
								ERR_UINT8_FILL	251		
								VDNE_UINT8_FILL	249		

Rx2PowerOff	1byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**
		PacketsPerGranule	Yes	No	40	40

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
RX2 On / Off - State of RX2 power switch command	0			unitless	No		unsigned 8-bit uchar	**Name**	**Value**	**Name**	**Value**
								NA_UINT8_FILL	255	On	0
								MISS_UINT8_FILL	254	Off	1
								ERR_UINT8_FILL	251		
								VDNE_UINT8_FILL	249		

TCLevelCmd	1byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**
		PacketsPerGranule	Yes	No	40	40

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
TC_LEVEL command received (data 0)	0			unitless	No		unsigned 8-bit uchar	**Name**	**Value**	**Name**	**Value**
								NA_UINT8_FILL	255	No	0
								MISS_UINT8_FILL	254	Yes	1
								ERR_UINT8_FILL	251		
								VDNE_UINT8_FILL	249		

DT06	1byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**
		PacketsPerGranule	Yes	No	40	40

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Not used (data 1)	0			unitless	No		unsigned 8-bit uchar	**Name**	**Value**	**Name**	**Value**
								NA_UINT8_FILL	255	Always	0
								MISS_UINT8_FILL	254	Never	1

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										ERR_UINT8_FILL	251	
										VDNE_UINT8_FILL	249	

MajorSoftwareFailure — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
PacketsPerGranule	Yes	No	40	40

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Major software failure (data 2)	0			unitless	No		unsigned 8-bit uchar	**Name**	**Value**	**Name**	**Value**
								NA_UINT8_FILL	255	No	0
								MISS_UINT8_FILL	254	Yes	1
								ERR_UINT8_FILL	251		
								VDNE_UINT8_FILL	249		

MemoryFailure — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
PacketsPerGranule	Yes	No	40	40

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Memory failure (data 3)	0			unitless	No		unsigned 8-bit uchar	**Name**	**Value**	**Name**	**Value**
								NA_UINT8_FILL	255	No	0
								MISS_UINT8_FILL	254	Yes	1
								ERR_UINT8_FILL	251		
								VDNE_UINT8_FILL	249		

WatchdogTimeout — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
PacketsPerGranule	Yes	No	40	40

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Watchdog timeout (data 4)	0			unitless	No		unsigned 8-bit uchar	**Name**	**Value**	**Name**	**Value**
								NA_UINT8_FILL	255	No	0
								MISS_UINT8_FILL	254	Yes	1
								ERR_UINT8_FILL	251		
								VDNE_UINT8_FILL	249		

MinorSoftwareFailure — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
PacketsPerGranule	Yes	No	40	40

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries

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		Minor software failure (data 5)	0			unitless	No		unsigned 8-bit uchar	Name	Value	Name	Value
										NA_UINT8_FILL	255	No	0
										MISS_UINT8_FILL	254	Yes	1
										ERR_UINT8_FILL	251		
										VDNE_UINT8_FILL	249		

UGSoftwareMode	1byte(s)	Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size							
		PacketsPerGranule	Yes	No	40	40							
		Datum											
		Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
		UG software mode (data 6)	0			unitless	No		unsigned 8-bit uchar	Name	Value	Name	Value
										NA_UINT8_FILL	255	NOMINAL	0
										MISS_UINT8_FILL	254	INIT	1
										ERR_UINT8_FILL	251		
										VDNE_UINT8_FILL	249		

MajorSETError	1byte(s)	Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size							
		PacketsPerGranule	Yes	No	40	40							
		Datum											
		Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
		Processor failure - Major SET error (data 7)	0			unitless	No		unsigned 8-bit uchar	Name	Value	Name	Value
										NA_UINT8_FILL	255	No	0
										MISS_UINT8_FILL	254	Yes	1
										ERR_UINT8_FILL	251		
										VDNE_UINT8_FILL	249		

DT13	1byte(s)	Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size							
		PacketsPerGranule	Yes	No	40	40							
		Datum											
		Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
		Status SARP Spare 0	0			unitless	No		unsigned 8-bit uchar	Name	Value	Name	Value
										NA_UINT8_FILL	255		
										MISS_UINT8_FILL	254		
										ERR_UINT8_FILL	251		
										VDNE_UINT8_FILL	249		

DT14	1byte(s)	Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
		PacketsPerGranule	Yes	No	40	40
		Datum				

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		Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
		Status SARP Spare 1	0			unitless	No		unsigned 8-bit uchar	Name	Value	Name	Value
										NA_UINT8_FILL	255		
										MISS_UINT8_FILL	254		
										ERR_UINT8_FILL	251		
										VDNE_UINT8_FILL	249		

DT15 — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
PacketsPerGranule	Yes	No	40	40

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Status SARP Spare 2	0			unitless	No		unsigned 8-bit uchar	Name	Value	Name	Value
								NA_UINT8_FILL	255		
								MISS_UINT8_FILL	254		
								ERR_UINT8_FILL	251		
								VDNE_UINT8_FILL	249		

RPUTemp — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
PacketsPerGranule	Yes	No	40	40

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
SARP RPU Temperature when 28 V analog TLM Bus is available	0			degree Celsius	No		32-bit floating point	Name	Value	Name	Value
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

AT02 — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
PacketsPerGranule	Yes	No	40	40

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
SARP Temperature Spare 0	0			n/a	No		32-bit floating point	Name	Value	Name	Value
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

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AT03	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**									
		PacketsPerGranule	Yes	No	40	40									
		Datum													
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**			
		SARP Temperature Spare 1	0			n/a	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**		
										NA_FLOAT32_FILL	-999.9				
										MISS_FLOAT32_FILL	-999.8				
										ERR_FLOAT32_FILL	-999.5				
										VDNE_FLOAT32_FILL	-999.3				
AT04	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**									
		PacketsPerGranule	Yes	No	40	40									
		Datum													
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**			
		SARP Temperature Spare 2	0			n/a	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**		
										NA_FLOAT32_FILL	-999.9				
										MISS_FLOAT32_FILL	-999.8				
										ERR_FLOAT32_FILL	-999.5				
										VDNE_FLOAT32_FILL	-999.3				
RPU5V	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**									
		PacketsPerGranule	Yes	No	40	40									
		Datum													
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**			
		SARP RPU +5V	0			V	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**		
										NA_FLOAT32_FILL	-999.9				
										MISS_FLOAT32_FILL	-999.8				
										ERR_FLOAT32_FILL	-999.5				
										VDNE_FLOAT32_FILL	-999.3				
RPUMinus5V	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**									
		PacketsPerGranule	Yes	No	40	40									
		Datum													
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**			
		SARP RPU - 5V	0			V	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**		
										NA_FLOAT32_FILL	-999.9				

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										MISS_FLOAT32_FILL	-999.8	
										ERR_FLOAT32_FILL	-999.5	
										VDNE_FLOAT32_FILL	-999.3	

RPU12V — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
PacketsPerGranule	Yes	No	40	40

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
SARP RPU +12V	0			V	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

RPUMinus12V — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
PacketsPerGranule	Yes	No	40	40

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
SARP RPU - 12V	0			V	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

OCXOOvenCurrent — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
PacketsPerGranule	Yes	No	40	40

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
SARP OCXO Oven Current	0			V	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

OCXOOutputLevel — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
PacketsPerGranule	Yes	No	40	40

Datum

Description	Datum Offset	Unscaled Valid Range	Unscaled Valid Range	Measurement Units	Scaled	Scale Factor	Data Type	Fill Values	Legend Entries

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				Min	Max			Name			
		SARP OCXO Output Level	0			mW	No		32-bit floating point	Name / Value: NA_FLOAT32_FILL -999.9; MISS_FLOAT32_FILL -999.8; ERR_FLOAT32_FILL -999.5; VDNE_FLOAT32_FILL -999.3	Name / Value

AT11 — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
PacketsPerGranule	Yes	No	40	40

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
SARP Voltage Spare 0	0			n/a	No		32-bit floating point	Name / Value: NA_FLOAT32_FILL -999.9; MISS_FLOAT32_FILL -999.8; ERR_FLOAT32_FILL -999.5; VDNE_FLOAT32_FILL -999.3	Name / Value

AT12 — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
PacketsPerGranule	Yes	No	40	40

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
SARP Voltage Spare 1	0			n/a	No		32-bit floating point	Name / Value: NA_FLOAT32_FILL -999.9; MISS_FLOAT32_FILL -999.8; ERR_FLOAT32_FILL -999.5; VDNE_FLOAT32_FILL -999.3	Name / Value

AT13 — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
PacketsPerGranule	Yes	No	40	40

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
SARP Voltage Spare 2	0			n/a	No		32-bit floating point	Name / Value: NA_FLOAT32_FILL -999.9; MISS_FLOAT32_FILL -999.8; ERR_FLOAT32_FILL -999.5; VDNE_FLOAT32_FILL -999.3	Name / Value

RPUConverterTemp — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
PacketsPerGranule	Yes	No	40	40

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		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		SARP RPU Converter Temperature	0			degree Celsius	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
										NA_FLOAT32_FILL	-999.9		
										MISS_FLOAT32_FILL	-999.8		
										ERR_FLOAT32_FILL	-999.5		
										VDNE_FLOAT32_FILL	-999.3		

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2.13.2.3 SARP SDR HDF5 Details

Figure 2.13.2.3-1 provides the details on the content and data types of the SARP SDR. This UML diagram provides details at the product level only. In addition to this UML diagram, refer to Figure 2.2-1, Generalized UML Diagram for HDF5 SDR/TDR Files, for a complete UML rendering of this product.

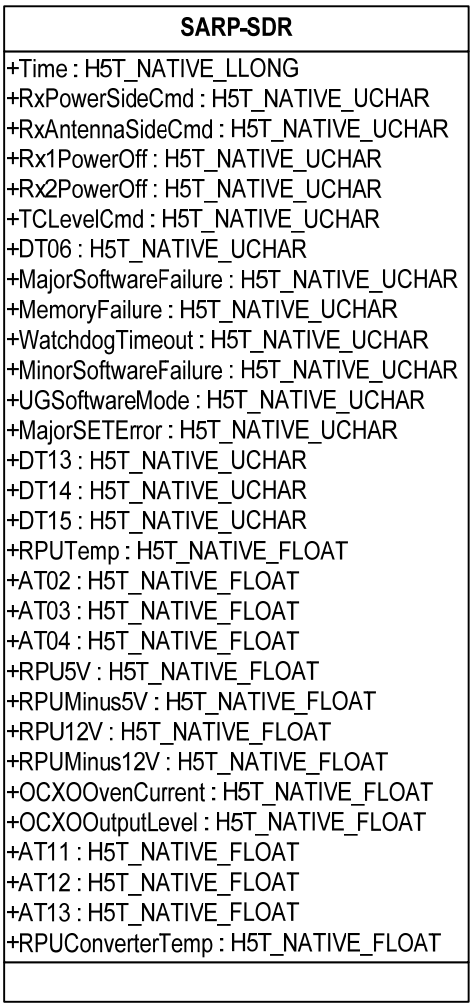

Figure 2.13.2.3-1, SARP SDR UML Diagram

2.13.2.4 SARP SDR Metadata Details

The HDF5 metadata elements associated with the SARP SDR are listed in the CDFCB-X Volume V, Section 4.3, HDF5 (Metadata) Hierarchy. The SARP SDR metadata includes most common metadata attributes at the root, product, aggregation, and Granule level with the exception of geolocation attributes, such as Zenith and Azimuth

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Angles, G-Ring values, and Bounding Coordinates.

The SARP SDR does not contain any Quality Summary Metadata Values.

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2.14 DELETED

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2.15 DELETED

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2.16 Visible/Infrared Imaging Radiometer Suite Moderate Resolution Band Sensor Data Records

Table 2.16-1, VIIRS Moderate Resolution Band (M-Band) summarizes the M-Band channels and their respective data mnemonics. The SDRs are available separately, but they are presented in this section grouped together in order to minimize the repeated information.

Table 2.16-1, VIIRS M-Band SDRs

Data Mnemonic	Description/Purpose
SDRE-VM01-C0030	Band M1 - radiance & reflectance at nominal center wavelength 412 nm.
SDRE-VM02-C0030	Band M2 – radiance & reflectance at nominal center wavelength 445 nm.
SDRE-VM03-C0030	Band M3 – radiance & reflectance at nominal center wavelength 488 nm.
SDRE-VM04-C0030	Band M4 – radiance & reflectance at nominal center wavelength 555 nm.
SDRE-VM05-C0030	Band M5 – radiance & reflectance at nominal center wavelength 672 nm.
SDRE-VM06-C0030	Band M6 – radiance & reflectance at nominal center wavelength 746 nm.
SDRE-VM07-C0030	Band M7 – radiance & reflectance at nominal center wavelength 865 nm.
SDRE-VM08-C0030	Band M8 – radiance & reflectance at nominal center wavelength 1240 nm.
SDRE-VM09-C0030	Band M9 – radiance & reflectance at nominal center wavelength 1378 nm.
SDRE-VM10-C0030	Band M10 – radiance & reflectance at nominal center wavelength 1610 nm.
SDRE-VM11-C0030	Band M11 – radiance & reflectance at nominal center wavelength 2250 nm.
SDRE-VM12-C0030	Band M12 – radiance & emittance at nominal center wavelength 3700 nm.
SDRE-VM13-C0030	Band M13 – radiance & emittance at nominal center wavelength 4050 nm.
SDRE-VM14-C0030	Band M14 – radiance & emittance at nominal center wavelength 8550 nm.
SDRE-VM15-C0030	Band M15 – radiance & emittance at nominal center wavelength 10763 nm.
SDRE-VM16-C0030	Band M16 – radiance & emittance at nominal center wavelength 12013 nm.

Data Mnemonic	See Table 2.16-1, VIIRS M-Band SDRs
Description/ Purpose	See Table 2.16-1, VIIRS M-Band SDRs The Visible/Infrared Imaging/Radiometer Suite (VIIRS) collects visible/infrared imagery and radiometric data. There are 16 detectors along-track in the M-Bands and 32 detectors along-track in the Imagery Resolution Bands (I-Band). *General Information on VIIRS SDRs* As the VIIRS telescope rotates across-track, every 1.7872 seconds,

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	arrays of pixels are captured, creating a ~3000 km x ~12 km (across-track x along-track) image of the earth. Since VIIRS does not capture an entire earth image instantaneously, there is an inherent time delay in collecting a full set of pixels for each scan, and from scan to scan. From scan to scan, the delay is set such that the next scan is exactly one full field-of-regard, the detectors' horizontal along-track coverage, away from the previous scan. For instance the first row of detectors will be adjacent to the last row of detectors on the next scan. Although the output seen in the SDR is an array of data, for a number of reasons described below, the actual measurements from VIIRS are not perfectly contiguous within the array. Each geolocation data point should be used to accurately georeference the data, especially when viewing data from multiple scans. Since the rotation period is a specification which has a tolerance of +/- .45%, the actual rotation rate can vary. The actual value should be calculated from the scan times provided in the geolocation. The processing system of NPOESS is designed to allow for this specification tolerance. The processing software uses time rather than data size to define granules, and in order to never "overflow" the processing buffer size of one granule, the size of the internal granule is slightly smaller than the expected 85.7856 seconds (1.7872 seconds * 48 scans/second). This has the advantage of never allowing more scans than can fit in a granule, but has the disadvantage of generating scenarios where fewer than the nominal number of scans per granule can occur. Although this can happen for a number of other reasons, for a nominal granule containing 48 scans, on occasion there can be 47 scans due to the design to allow for tolerance in scan rates. The number of actual scans in the granule is stored in the granule metadata item N_Number_Of_Scans. Since granule array dimensions are fixed in size, the last scan in this 47 of 48 scan case will be filled with a "does not exist" type of fill value. The corresponding geolocation will also be filled since the values in the array are simply artifacts of the processing system. More information on fill values can be found in Volume I of the CDFCB-X, D34862-01, Section 3.5. For all nominal NPOESS orbits (afternoon Local Time of Ascending Node) the first detector produces the 16th scan line (or pixel row). When referring to the "bad detector" flag array, the first array element represents detector 1 (which for the M-Band is pixel row 16). Note: VIIRS auxiliary data, such as relative spectral response curves, reference the detector number and not scan line. While the geolocation angles included with VIIRS SDRs are with respect to the Geoid, the calibrated TOA reflectance is calculated using the terrain corrected solar zenith angle. Note that radiances are not corrected for out of band contributions.

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	Moderate and Imagery Resolution Aggregation and Bow-tie Deletion VIIRS fundamental spatial measurement unit is a *sample*, however *pixels* are reported in the SDR product. The projected size on the ground of samples gets larger at larger scan angles off nadir due to the increased distance from the sensor and the observed angle of incidence. Samples are created from pixels by averaging (aggregating) across-track which creates more horizontally uniform pixels. The samples with a scan angle within 32 degrees of nadir, have a smaller size when projected on the ground, and so are aggregated 3:1 in the scan (across-track) dimension. Those occurring at scan angles between ~32 degrees and ~45 degrees off nadir are aggregated 2:1 in the scan dimension. The samples at scan angles greater than ~45 degrees off nadir are not aggregated. The aggregation of samples across the scan reduces the total number of samples; however, there is still a factor of two increase in the projected ground size of each pixel from nadir to maximum scan angle. This is referred to as the bow-tie effect (See Figure 2.16.1-1, VIIRS Bow-Tie Effect), as the projected scan track for all the pixels in one scan generally resembles a bow-tie. The additional pixel rows, in the two outside aggregation zones mentioned above, duplicate coverage from scan to scan, and are deleted. The deletion process impact for M-Band pixels is shown in Figure 2.16.1-2, VIIRS Bow-tie Deletion. This results in about half of the bow-tie overlapping pixels not being transmitted to ground. The values in the resulting product arrays are filled with the on-board pixel trim fill values during ground processing.
File-Naming Construct	See the CDFCB-X Volume I, D34862-01, Section 3.0 for details.
File Size	Bands / Size per data granule M1,M2,M6,M8-12,M14-16 / Approximately 12,000 KiB M3-M5, M7 / Approximately 16,800 KiB M13 / Approximately 21,600 KiB Approximately: 79,200 KiB per geolocation granule Sizes do not include HDF5 overhead or metadata.
File Format Type	HDF5

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Data Content and Data Format	See Section 2.16.1 VIIRS M-Band SDR Data Content Summary. See Section 2.16.5 VIIRS M-Band SDR Geolocation Content Summary.

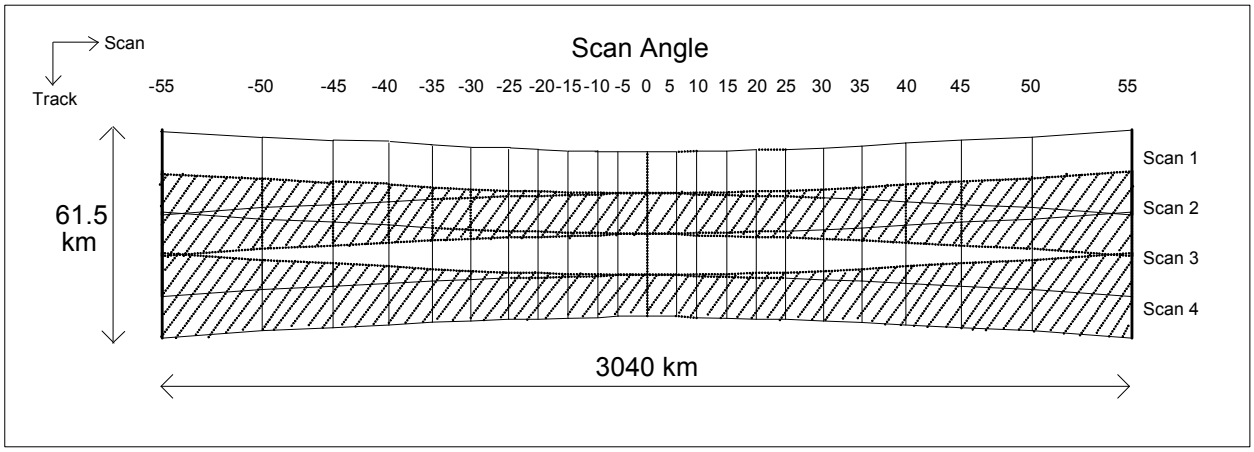

Figure 2.16.1-1, VIIRS Panoramic Bow-tie Effect (Afternoon Local Time of Ascending Node)

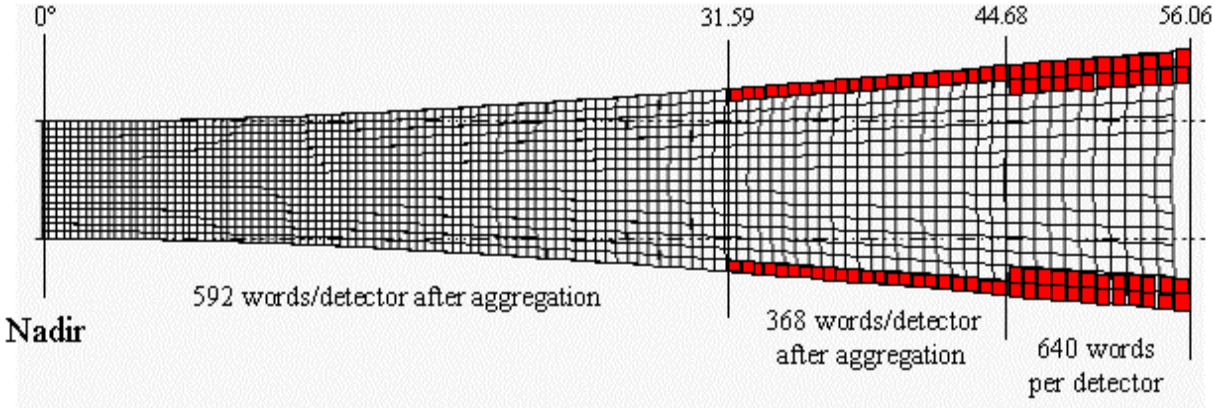

Figure 2.16.1-2, VIIRS Bow-tie Deletion

2.16.1 VIIRS M-Band SDR Data Content Summary

The VIIRS M-Band SDR data arrays structures are summarized below in Table 2.16.1-1, VIIRS M-Band SDR Data Content Summary.

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Table 2.16.1-1, VIIRS M-Band SDRs Data Content Summary

Name	Description	Data Type	Bands	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
Radiance	Calibrated Top of Atmosphere (TOA) Radiance for each VIIRS pixel	32-bit floating point	M3-M5, M7, M13	[N*768, 3200]	[768,3200]	W/(m^2 sr μm)
		unsigned 16-bit integer	M1, M2, M6, M8-M12, M14-M16			
Reflectance	Calibrated TOA Reflectance for each VIIRS pixel	unsigned 16-bit integer	M1 – M11	[N*768, 3200]	[768,3200]	unitless
BrightnessTemperature	Calibrated TOA Brightness Temperature for each VIIRS pixel	32-bit floating point	M13	[N*768, 3200]	[768,3200]	kelvin
		unsigned 16-bit integer	M12, M14 – M16			
ModeScan	The VIIRS operational mode, reported at the scan level.	unsigned 8-bit char	M1 – M16	[N*48]	[48]	unitless
ModeGran	The VIIRS operational mode, reported at the granule level.	unsigned 8-bit char	M1 – M16	[N]	[1]	unitless
PadByte1	Pad byte	unsigned 8-bit char	M1 – M16	[N*3]	[3]	unitless
NumberOfScans	Actual number of VIIRS scans that were used to create this granule.	32-bit integer	M1 – M16	[N]	[1]	unitless
NumberOfMissingPkts	Number of missing packets in scan	32-bit integer	M1 – M16	[N*48]	[48]	unitless
NumberOfBadChecksums	Number of packets with bad checksum in scan	32-bit integer	M1 – M16	[N*48]	[48]	unitless
NumberOfDiscardedPkts	Number of discarded packets in scan	32-bit integer	M1 – M16	[N*48]	[48]	unitless
QF1_VIIRSMBANDSDR	Quality Flag for each pixel	unsigned 8-bit char	M1 – M16	[N*768, 3200]	[768,3200]	unitless

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Name	Description	Data Type	Bands	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
QF2_SCAN_SDR	Quality Flag for each Scan (indicates general SDR information)	unsigned 8-bit char	M1 – M16	[N*48]	[48]	unitless
QF3_SCAN_RDR	Quality Flag for each Scan (indicates general RDR information)	unsigned 8-bit char	M1 – M16	[N*48]	[48]	unitless
QF4_SCAN_SDR	Reduced Quality Indication	unsigned 8-bit char	M1 – M16	[N*768]	[768]	unitless
QF5_GRAN_BADDETECTOR	Quality Flag – Bad detector	unsigned 8-bit char	M1 – M16	[N*16]	[16]	unitless
RadianceFactors	Radiance scale and offset: first array element = scale second array element = offset	32-bit floating point	M1, M2, M6, M8-M12, M14-M16	[N]	[2]	unitless, $W/(m^2 sr \mu m)$
ReflectanceFactors	Reflectance scale and offset: first array element = scale second array element = offset	32-bit floating point	M1-M11	[N]	[2]	unitless, unitless
BrightnessTemperatureFactors	Brightness Temperature scale and offset: first array element = scale second array element = offset	32-bit floating point	M12, M14 – M16	[N]	[2]	unitless, kelvin

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2.16.2 VIIRS M-Band SDR Data Product Profile

Table 2.16.2-1, VIIRS M-Band Radiances, Bands 1, 2, 6, 8-12, 14-16

Fields

Name	Data Size	Dimensions
Radiance	2byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	768	768
CrossTrack	No	No	3200	3200

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Calibrated Top of Atmosphere (TOA) Radiance for each VIIRS pixel	0			W/(m^2 μm sr)	Yes	RadianceFactors	unsigned 16-bit integer		

Name	Value
NA_UINT16_FILL	65535
MISS_UINT16_FILL	65534
ONBOARD_PT_UINT16_FILL	65533
ONGROUND_PT_UINT16_FILL	65532
ERR_UINT16_FILL	65531
SOUB_UINT16_FILL	65528
VDNE_UINT16_FILL	65529

Name	Value

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Table 2.16.2-2, VIIRS M-Band Radiances, Bands 3-5, 7, 13

Fields

Name	Data Size	Dimensions
Radiance	4byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	768	768
CrossTrack	No	No	3200	3200

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Calibrated Top of Atmosphere (TOA) Radiance for each VIIRS pixel	0			W/(m^2 μm sr)	Yes		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ONBOARD_PT_FLOAT32_FILL	-999.7		
								ONGROUND_PT_FLOAT32_FILL	-999.6		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

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Table 2.16.2-3, VIIRS M-Band Reflectance, Bands 1-11

Fields

Name	Data Size	Dimensions
Reflectance	2byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	768	768
CrossTrack	No	No	3200	3200

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Calibrated Top of Atmosphere (TOA) Reflectance for each VIIRS pixel	0			unitless	Yes	ReflectanceFactors	unsigned 16-bit integer		

Name	Value
NA_UINT16_FILL	65535
MISS_UINT16_FILL	65534
ONBOARD_PT_UINT16_FILL	65533
ONGROUND_PT_UINT16_FILL	65532
ERR_UINT16_FILL	65531
VDNE_UINT16_FILL	65529
SOUB_UINT16_FILL	65528

Name	Value

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Table 2.16.2-4, VIIRS M-Band Brightness Temperature, Bands 12, 14 – 16

Fields

Name	Data Size	Dimensions
BrightnessTemperature	2byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	768	768
CrossTrack	No	No	3200	3200

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Calibrated Top of Atmosphere (TOA) Brightness Temperature for each VIIRS pixel	0			K	Yes	BrightnessTemperatureFactors	unsigned 16-bit integer	NA_UINT16_FILL	65535		
								MISS_UINT16_FILL	65534		
								ONBOARD_PT_UINT16_FILL	65533		
								ONGROUND_PT_UINT16_FILL	65532		
								ERR_UINT16_FILL	65531		
								VDNE_UINT16_FILL	65529		
								SOUB_UINT16_FILL	65528		

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Table 2.16.2-5, VIIRS M-Band Brightness Temperature, Bands 13

Fields

Name	Data Size	Dimensions
BrightnessTemperature	4byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	768	768
CrossTrack	No	No	3200	3200

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Calibrated Top of Atmosphere (TOA) Brightness Temperature for each VIIRS pixel	0			kelvin	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ONBOARD_PT_FLOAT32_FILL	-999.7		
								ONGROUND_PT_FLOAT32_FILL	-999.6		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

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Table 2.16.2-6, VIIRS M-Band Product Profile, Bands 1 - 16

Name	Data Size	Dimensions
ModeScan	1byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	48	48

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
The VIIRS operational mode, reported at the scan level	0			unitless	No		unsigned 8-bit char	**Name**	**Value**	**Name**	**Value**
								MISS_UINT8_FILL	254	Night	0
								ERR_UINT8_FILL	251	Day	1
								VDNE_UINT8_FILL	249		

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	1	1

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
The VIIRS operational mode, reported at the granule level				unitless	No		unsigned 8-bit char	**Name**	**Value**	**Name**	**Value**
								MISS_UINT8_FILL	254	Night	0
								ERR_UINT8_FILL	251	Day	1
								VDNE_UINT8_FILL	249	Mixed	2

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	3	3

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Pad byte	0			unitless	No		unsigned 8-bit char	**Name**	**Value**	**Name**	**Value**

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
NumberOfScans	4byte(s)			

		Granule	Yes	No	1	1							
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Actual number of VIIRS scans that were used to create this granule	0			unitless	No		32-bit integer	**Name**	**Value**	**Name**	**Value**
NumberOfMissingPkts	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**							
		Scan	Yes	No	48	48							
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Number of missing packets in scan	0			unitless	No		32-bit integer	**Name**	**Value**	**Name**	**Value**
										MISS_INT32_FILL	-998		
										VDNE_INT32_FILL	-993		
NumberOfBadChecksums	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**							
		Scan	Yes	No	48	48							
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Number of packets with bad checksums in scan	0			unitless	No		32-bit integer	**Name**	**Value**	**Name**	**Value**
										MISS_INT32_FILL	-998		
										VDNE_INT32_FILL	-993		
NumberOfDiscardedPkts	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**							
		Scan	Yes	No	48	48							
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Number of	0			unitless	No		32-bit	**Name**	**Value**	**Name**	**Value**

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		discarded packets in scan							integer	MISS_INT32_FILL VDNE_INT32_FILL	-998 -993	

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Table 2.16.2-7, VIIRS M-Band SDR Product Profile - Quality Flags

Name	Data Size	Dimensions
QF1_VIIRSMBANDSDR	1byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	768	768
CrossTrack	No	No	3200	3200

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Quality - Indicates calibration quality due to bad space view offsets, OBC view offsets, etc or use of a previous calibration view	0			unitless	No		2 bit(s)			Good	0
										Poor	1
										No Calibration	2
Saturated Pixel - Indicates the level of pixel saturation	2			unitless	No		2 bit(s)			None Saturated	0
										Some Saturated	1
										All Saturated	2
Missing Data - Data required for calibration processing is not available for processing	4			unitless	No		2 bit(s)			All data present	0
										EV RDR data missing	1
										Cal data (SV, CV, SD, etc.) missing	2
										Thermistor data missing	3
Out of Range - Calibrated pixel value outside of LUT	6			unitless	No		2 bit(s)			All data within range	0
										Radiance out of range	1
										Reflectance or EBBT out of range	2

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		threshold limits									Both Radiance and Reflectance or EBBT out of range	3

QF2_SCAN_SDR — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	48	48

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Half Angle Mirror Side	0			unitless	No		1 bit(s)			A-Side	0
										B-Bide	1
The Moon has corrupted the space view	1			unitless	No		1 bit(s)			False	0
										True	1
Spare	2			unitless	No		6 bit(s)				

QF3_SCAN_RDR — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	48	48

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Checksum failed for zone 1	0			unitless	No		1 bit(s)			False	0
										True	1
Checksum failed for zone 2	1			unitless	No		1 bit(s)			False	0
										True	1
Checksum failed for zone 3	2			unitless	No		1 bit(s)			False	0
										True	1
Checksum failed for zone 4	3			unitless	No		1 bit(s)			False	0

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											True	1
		Checksum failed for zone 5	4			unitless	No		1 bit(s)	**Name** **Value**	**Name**	**Value**
											False	0
											True	1
		Checksum failed for zone 6	5			unitless	No		1 bit(s)	**Name** **Value**	**Name**	**Value**
											False	0
											True	1
		Scan data is not Present (No valid data)	6			unitless	No		1 bit(s)	**Name** **Value**	**Name**	**Value**
											False	0
											True	1
		Spare	7			unitless	No		1 bit(s)	**Name** **Value**	**Name**	**Value**

QF4_SCAN_SDR — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	768	768

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Quality for this scan-line is reduced. The value is determined by the combined number of steps required to find a replacement for thermistor or calibration source data.	0			unitless	No		unsigned 8-bit char	**Name** **Value**	**Name** **Value** False 0 True >1

QF5_GRAN_BADDETECTOR — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Detector	Yes	No	16	16

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Bad Detector - M-Band	0			unitless	No		1 bit(s)	**Name** **Value**	**Name** **Value** False 0

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												True	1
		Spare	1				No		7 bit(s)	**Name**	**Value**	**Name**	**Value**

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Table 2.16.2-8, VIIRS M-Band SDR Product Profile – Factors (as applicable)

Name	Data Size	Dimensions
RadianceFactors	4byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Factors	Yes	No	2	2

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Scale = first array element; offset = second array element	0			Scale = unitless; Offset = W/(m^2 sr μm)	No		32-bit floating point				

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Factors	Yes	No	2	2

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Scale = first array element; offset = second array element	0			unitless	No		32-bit floating point				

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Factors	Yes	No	2	2

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Scale = first array element; offset = second array element	0			Scale = unitless, Offset = kelvin	No		32-bit floating point				

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2.16.3 VIIRS M-Band SDR HDF5 Details

VIIRS-M[1,2,6,8,9,10,11]-SDR
+Radiance : H5T_NATIVE_USHORT +Reflectance : H5T_NATIVE_USHORT +ModeScan : H5T_NATIVE_UCHAR +ModeGran : H5T_NATIVE_UCHAR +PadByte1 : H5T_NATIVE_UCHAR +NumberOfScans : H5T_NATIVE_INT +NumberOfMissingPkts : H5T_NATIVE_INT +NumberOfBadChecksums : H5T_NATIVE_INT +NumberOfDiscardedPkts : H5T_NATIVE_INT +QF1_VIIRSMBANDSDR : H5T_NATIVE_UCHAR +QF2_SCAN_SDR : H5T_NATIVE_UCHAR +QF3_SCAN_RDR : H5T_NATIVE_UCHAR +QF4_SCAN_SDR : H5T_NATIVE_UCHAR +QF5_GRAN_BADDETECTOR : H5T_NATIVE_UCHAR +RadianceFactors : H5T_NATIVE_FLOAT +ReflectanceFactors : H5T_NATIVE_FLOAT

Figure 2.16.3-1, VIIRS M-Band SDR UML Diagram for Bands 1, 2, 6, 8, 9, 10, 11

VIIRS-M[3,4,5,7]-SDR
+Radiance : H5T_NATIVE_FLOAT +Reflectance : H5T_NATIVE_USHORT +ModeScan : H5T_NATIVE_UCHAR +ModeGran : H5T_NATIVE_UCHAR +NumberOfScans : H5T_NATIVE_INT +PadByte1 : H5T_NATIVE_UCHAR +NumberOfMissingPkts : H5T_NATIVE_INT +NumberOfBadChecksums : H5T_NATIVE_INT +NumberOfDiscardedPkts : H5T_NATIVE_INT +QF1_VIIRSMBANDSDR : H5T_NATIVE_UCHAR +QF2_SCAN_SDR : H5T_NATIVE_UCHAR +QF3_SCAN_RDR : H5T_NATIVE_UCHAR +QF4_SCAN_SDR : H5T_NATIVE_UCHAR +QF5_GRAN_BADDETECTOR : H5T_NATIVE_UCHAR +ReflectanceFactors : H5T_NATIVE_FLOAT

Figure 2.16.3-2, VIIRS M-Band SDR UML Diagram for Bands 3, 4, 5, 7

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VIIRS-M[12,14,15,16]-SDR
+Radiance : H5T_NATIVE_USHORT +BrightnessTemperature : H5T_NATIVE_USHORT +ModeScan : H5T_NATIVE_UCHAR +ModeGran : H5T_NATIVE_UCHAR +PadByte1 : H5T_NATIVE_UCHAR +NumberOfScans : H5T_NATIVE_INT +NumberOfMissingPkts : H5T_NATIVE_INT +NumberOfBadChecksums : H5T_NATIVE_INT +NumberOfDiscardedPkts : H5T_NATIVE_INT +QF1_VIIRSMBANDSDR : H5T_NATIVE_UCHAR +QF2_SCAN_SDR : H5T_NATIVE_UCHAR +QF3_SCAN_RDR : H5T_NATIVE_UCHAR +QF4_SCAN_SDR : H5T_NATIVE_UCHAR +QF5_GRAN_BADDETECTOR : H5T_NATIVE_UCHAR +RadianceFactors : H5T_NATIVE_FLOAT +BrightnessTemperatureFactors : H5T_NATIVE_FLOAT

Figure 2.16.3-3, VIIRS M-Band SDR UML Diagram for Bands 12, 14, 15, 16

VIIRS-M13-SDR
+Radiance : H5T_NATIVE_FLOAT +BrightnessTemperature : H5T_NATIVE_FLOAT +ModeScan : H5T_NATIVE_UCHAR +ModeGran : H5T_NATIVE_UCHAR +PadByte1 : H5T_NATIVE_UCHAR +NumberOfScans : H5T_NATIVE_INT +NumberOfMissingPkts : H5T_NATIVE_INT +NumberOfBadChecksums : H5T_NATIVE_INT +NumberOfDiscardedPkts : H5T_NATIVE_INT +QF1_VIIRSMBANDSDR : H5T_NATIVE_UCHAR +QF2_SCAN_SDR : H5T_NATIVE_UCHAR +QF3_SCAN_RDR : H5T_NATIVE_UCHAR +QF4_SCAN_SDR : H5T_NATIVE_UCHAR +QF5_GRAN_BADDETECTOR : H5T_NATIVE_UCHAR

Figure 2.16.3-4, VIIRS M-Band SDR UML Diagram for Band 13

2.16.4 VIIRS M-Band SDR Metadata Details

The HDF5 metadata elements associated with the M-Band SDR are listed in the CDFCB-X Volume V, Section 4.3, HDF5 (Metadata) Hierarchy. The M-Band SDR metadata includes all common metadata at the root, product, aggregation, and granule level.

In addition to the common metadata items for the VIIRS Moderate Resolution SDR, the items listed in Table 2.16.4-1, VIIRS Moderate Resolution SDR Quality Summary Metadata are included as name/value pair items under the granule level metadata

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attribute “N_Quality_Summary”. The listed name/value pair items in the table are the granule level quality summary flags for the VIIRS M-Band SDRs.

Note that there is a standard granule level metadata item that identifies the M-Band. This metadata item is the “Band_ID” and is set to “M1”, “M2”, “M3”, …”M16”.

Table 2.16.4-1, VIIRS Moderate Resolution SDR Quality Summary Metadata Values

N_Quality_Summary			
Name	**Value**	**Description**	**Comments**
Summary VIIRS SDR Quality	0 – 100 %	Percentage of good quality pixels in granule	
Scan Quality Exclusion	0 – 48	Number of scans in granule excluded from processing (including partial scans)	

2.16.5 VIIRS M-Band SDR Geolocation Content Summary

The VIIRS M-Band SDR geolocation data arrays structures are summarized below in Table 2.16.5-1, VIIRS M-Band SDR Geolocation Content Summary.

Table 2.16.5-1 VIIRS M-Band SDR Geolocation Content Summary

Name	Description	Data Type	Aggregate Dimensions	Granule Dimensions	Units
StartTime	Starting Time of each scan in IET (1/1/1958)	64-bit integer	[N*48]	[48]	microsecond
MidTime	Mid-Time of each scan in IET (1/1/1958)	64-bit integer	[N*48]	[48]	microsecond
Latitude	Latitude of each pixel (positive North)	32-bit floating point	[N*768, 3200]	[768, 3200]	degree
Longitude	Longitude of each pixel (positive East)	32-bit floating point	[N*768, 3200]	[768, 3200]	degree
SolarZenithAngle	Zenith angle of sun at each pixel position	32-bit floating point	[N*768, 3200]	[768, 3200]	degree

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Name	Description	Data Type	Aggregate Dimensions	Granule Dimensions	Units
SolarAzimuthAngle	Azimuth angle of sun (measured clockwise positive from North) at each pixel position	32-bit floating point	[N*768, 3200]	[768, 3200]	degree
SatelliteZenithAngle	Zenith angle to Satellite at each pixel position	32-bit floating point	[N*768, 3200]	[768, 3200]	degree
SatelliteAzimuthAngle	Azimuth angle (measured clockwise positive from North) to Satellite at each pixel position	32-bit floating point	[N*768, 3200]	[768, 3200]	degree
Height	Ellipsoid-Geoid separation	32-bit floating point	[N*768, 3200]	[768, 3200]	meter
SatelliteRange	Line of sight distance from the ellipsoid intersection to the satellite	32-bit floating point	[N*768, 3200]	[768, 3200]	meter
SCPosition	Spacecraft position in ECR Coordinates (X, Y, Z) at the mid-time of scan	32-bit floating point	[N*48, 3]	[48, 3]	meter
SCVelocity	Spacecraft velocity in ECR Coordinates (dx/dt, dy/dt, dz/dt) at the mid-time of scan	32-bit floating point	[N*48, 3]	[48, 3]	m/s
SCAttitude	Spacecraft attitude with respect to Geodetic Reference Frame Coordinates (roll, pitch, yaw) at the midtime of scan	32-bit floating point	[N*48, 3]	[48, 3]	arcsecond

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Name	Description	Data Type	Aggregate Dimensions	Granule Dimensions	Units
SCSolarZenithAngle	The angle from the normal vector of the Solar Diffuser surface (z-axis of the solar diffuser frame) to the solar vector	32-bit floating point	[N*48]	[48]	degree
SCSolarAzimuthAngle	The angle from the Solar Diffuser reference frame x-axis to the projection of the solar vector onto the solar diffuser surface (x-y plane), measured counterclockwise (observer looking toward the SD surface)	32-bit floating point	[N*48]	[48]	degree
ModeScan	The VIIRS operational mode, reported at the scan level.	unsigned 8-bit char	[N*48]	[48]	unitless
ModeGran	The VIIRS operational mode, reported at the granule level.	unsigned 8-bit char	[N]	[1]	unitless
PadByte1	Pad byte	unsigned 8-bit char	[N*3]	[3]	unitless
NumberOfScans	Actual number of VIIRS scans that were used to create this granule.	32-bit integer	[N]	[1]	unitless
QF1_SCAN_VIIRSSDRGEO	Scan-level quality flag	unsigned 8-bit char	[N*48]	[48]	unitless
QF2_VIIRSSDRGEO	Pixel-level quality flag	unsigned 8-bit char	[N*768, 3200]	[768,3200]	unitless

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2.16.6 VIIRS M-Band SDR Geolocation Product Profile

Table 2.16.6-1, VIIRS M-Band SDR Geolocation Product Profile

Name	Data Size	Dimensions
StartTime	8byte(s)	
MidTime	8byte(s)	
Latitude	4byte(s)	

StartTime — Dimensions

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	48	48

StartTime — Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Starting Time of each scan in IET (1/1/1958)	0			microsecond	No		64-bit integer	NA_INT64_FILL	-999		
								MISS_INT64_FILL	-998		
								ERR_INT64_FILL	-995		
								VDNE_INT64_FILL	-993		

MidTime — Dimensions

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	48	48

MidTime — Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Mid-Time of each scan in IET (1/1/1958)	0			microsecond	No		64-bit integer	NA_INT64_FILL	-999		
								MISS_INT64_FILL	-998		
								ERR_INT64_FILL	-995		
								VDNE_INT64_FILL	-993		

Latitude — Dimensions

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	768	768
CrossTrack	No	No	3200	3200

Latitude — Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries

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		Latitude of each pixel (positive North)	0	-90	90	degree	No		32-bit floating point	**Name** / **Value**: NA_FLOAT32_FILL -999.9; MISS_FLOAT32_FILL -999.8; ERR_FLOAT32_FILL -999.5; ELINT_FLOAT32_FILL -999.4; VDNE_FLOAT32_FILL -999.3	**Name** / **Value**		
Longitude	4byte(s)	**Name** / **Granule Boundary** / **Dynamic** / **Min Array Size** / **Max Array Size**: AlongTrack, Yes, No, 768, 768; CrossTrack, No, No, 3200, 3200											
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Longitude of each pixel (positive East)	0	-180	180	degree	No		32-bit floating point	**Name** / **Value**: NA_FLOAT32_FILL -999.9; MISS_FLOAT32_FILL -999.8; ERR_FLOAT32_FILL -999.5; ELINT_FLOAT32_FILL -999.4; VDNE_FLOAT32_FILL -999.3	**Name** / **Value**		
SolarZenithAngle	4byte(s)	**Name** / **Granule Boundary** / **Dynamic** / **Min Array Size** / **Max Array Size**: AlongTrack, Yes, No, 768, 768; CrossTrack, No, No, 3200, 3200											
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Zenith angle of sun at each pixel position	0	0	180	degree	No		32-bit floating point	**Name** / **Value**: NA_FLOAT32_FILL -999.9; MISS_FLOAT32_FILL -999.8; ERR_FLOAT32_FILL -999.5; ELINT_FLOAT32_FILL -999.4; VDNE_FLOAT32_FILL -999.3	**Name** / **Value**		
SolarAzimuthAngle	4byte(s)	**Name** / **Granule Boundary** / **Dynamic** / **Min Array Size** / **Max Array Size**											

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AlongTrack	Yes	No	768	768
CrossTrack	No	No	3200	3200

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Azimuth angle of sun (measured clockwise positive from North) at each pixel position	0	-180	180	degree	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								ELINT_FLOAT32_FILL	-999.4		
								VDNE_FLOAT32_FILL	-999.3		

SatelliteZenithAngle — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	768	768
CrossTrack	No	No	3200	3200

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Zenith angle to Satellite at each pixel position	0	0	~70	degree	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								ELINT_FLOAT32_FILL	-999.4		
								VDNE_FLOAT32_FILL	-999.3		

SatelliteAzimuthAngle — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	768	768
CrossTrack	No	No	3200	3200

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Azimuth angle	0	-180	180	degree	No		32-bit				

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		(measured clockwise positive from North) to Satellite at each pixel position							floating point	NA_FLOAT32_FILL	-999.9	
										MISS_FLOAT32_FILL	-999.8	
										ERR_FLOAT32_FILL	-999.5	
										ELINT_FLOAT32_FILL	-999.4	
										VDNE_FLOAT32_FILL	-999.3	

Height — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	768	768
CrossTrack	No	No	3200	3200

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Ellipsoid-Geoid separation	0			meter	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								ELINT_FLOAT32_FILL	-999.4		
								VDNE_FLOAT32_FILL	-999.3		

SatelliteRange — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	768	768
CrossTrack	No	No	3200	3200

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Line of sight distance from the ellipsoid intersection to the satellite	0			meter	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								ELINT_FLOAT32_FILL	-999.4		
								VDNE_FLOAT32_FILL	-999.3		

SCPosition — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	48	48

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		ECRCoordinate	No		No	3		3						
		Datum												
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**		
		Spacecraft position in ECR Coordinates (X, Y, Z) at the mid-time of scan	0			meter	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**	
										NA_FLOAT32_FILL	-999.9			
										MISS_FLOAT32_FILL	-999.8			
										ERR_FLOAT32_FILL	-999.5			
										VDNE_FLOAT32_FILL	-999.3			
SCVelocity	4byte(s)	**Name**	**Granule Boundary**		**Dynamic**	**Min Array Size**		**Max Array Size**						
		Scan	Yes		No	48		48						
		ECRCoordinate	No		No	3		3						
		Datum												
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**		
		Spacecraft velocity in ECR Coordinates (dx/dt, dy/dt, dz/dt) at the mid-time of scan	0			m/s	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**	
										NA_FLOAT32_FILL	-999.9			
										MISS_FLOAT32_FILL	-999.8			
										ERR_FLOAT32_FILL	-999.5			
										VDNE_FLOAT32_FILL	-999.3			
SCAttitude	4byte(s)	**Name**	**Granule Boundary**		**Dynamic**	**Min Array Size**		**Max Array Size**						
		Scan	Yes		No	48		48						
		GRFCoordinate	No		No	3		3						
		Datum												
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**		
		Spacecraft attitude with respect to Geodetic	0			arcsecond	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**	
										NA_FLOAT32_FILL	-999.9			
										MISS_FLOAT32_FILL	-999.8			

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		Reference Frame Coordinates (roll, pitch, yaw) at the midtime of scan								ERR_FLOAT32_FILL: -999.5 VDNE_FLOAT32_FILL: -999.3		
SCSolarZenithAngle	4byte(s)	**Name**: Scan **Granule Boundary**: Yes **Dynamic**: No **Min Array Size**: 48 **Max Array Size**: 48										
		Datum										
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**
		The angle from the normal vector of the Solar Diffuser surface (z-axis of the solar diffuser frame) to the solar vector	0	0	180	degree	No		32-bit floating point	**Name** / **Value** NA_FLOAT32_FILL: -999.9 MISS_FLOAT32_FILL: -999.8 ERR_FLOAT32_FILL: -999.5 VDNE_FLOAT32_FILL: -999.3		**Name** / **Value**
SCSolarAzimuthAngle	4byte(s)	**Name**: Scan **Granule Boundary**: Yes **Dynamic**: No **Min Array Size**: 48 **Max Array Size**: 48										
		Datum										
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**
		The angle from the Solar Diffuser reference frame x-axis to the projection of the solar vector onto the solar diffuser surface (x-y plane), measured counterclockwise (observer looking toward the SD surface)	0	-180	180	degree	No		32-bit floating point	**Name** / **Value** NA_FLOAT32_FILL: -999.9 MISS_FLOAT32_FILL: -999.8 ERR_FLOAT32_FILL: -999.5 VDNE_FLOAT32_FILL: -999.3		**Name** / **Value**

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ModeScan — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	48	48

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
The VIIRS operational mode, reported at the scan level	0			unitless	No		unsigned 8-bit char	MISS_UINT8_FILL	254	Night	0
								ERR_UINT8_FILL	251	Day	1
								VDNE_UINT8_FILL	249		

ModeGran — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	1	1

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
The VIIRS operational mode, reported at the granule level	0			unitless	No		unsigned 8-bit char	MISS_UINT8_FILL	254	Night	0
								ERR_UINT8_FILL	251	Day	1
								VDNE_UINT8_FILL	249	Mixed	2

PadByte1 — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	3	3

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Pad byte				unitless	No		unsigned 8-bit char				

NumberOfScans — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	1	1

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Actual number of VIIRS scans that were	0			unitless	No		32-bit integer				

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		used to create this granule									

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Table 2.16.6-2, VIIRS M-Band Geolocation Product Profile - Quality Flags

Name	Data Size	Dimensions
QF1_SCAN_VIIRSSDRGEO	1byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	48	48

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Attitude and Ephemeris availability status	0			unitless	No		2 bit(s)			Nominal - E&A data available	0
										Missing Data <= Small Gap	1
										Small Gap < Missing Data < Granule Boundary	2
										Missing Data >= Granule Boundary	3
HAM/RTA Encoder Flag - Indicates the quality of the HAM and RTA encoder timestamps	2			unitless	No		2 bit(s)	Name	Value	Name	Value
										Good Data	0
										Bad Data – either HAM, RTA, or both are bad for the entire scan	1
										Degraded Data – either HAM, RTA, or both are corrupted within the scan.	2
										Missing Data – Missing	3

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												encoder data for the scan	
		Within South Atlantic Anomaly	4			unitless	No		1 bit(s)	Name Value		Name Value False 0 True 1	
		Solar Eclipse during Earth view scan	5			unitless	No		1 bit(s)	Name Value		Name Value False 0 True 1	
		Spare	6			unitless	No		2 bit(s)	Name Value		Name Value	

QF2_VIIRSSDRGEO — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	768	768
CrossTrack	No	No	3200	3200

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Invalid Input Data (Indicates that any of the Spacecraft Ephemeris or Attitude Data is Invalid or the encoder data is invalid)	0			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
Bad Pointing (Indicates that the sensor LOS does not intersect the geoid, is near the limb, has invalid sensor angles or other similar condition)	1			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
Bad Terrain (Indicates that the algorithm could not obtain a valid terrain value)	2			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
Invalid Solar Angles	3			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1
Spare	4			unitless	No		4 bit(s)	Name Value	Name Value

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2.16.7 VIIRS M-Band SDR Geolocation HDF5 Details

VIIRS-MOD-GEO
+StartTime : H5T_NATIVE_LLONG +MidTime : H5T_NATIVE_LLONG +Latitude : H5T_NATIVE_FLOAT +Longitude : H5T_NATIVE_FLOAT +SolarZenithAngle : H5T_NATIVE_FLOAT +SolarAzimuthAngle : H5T_NATIVE_FLOAT +SatelliteZenithAngle : H5T_NATIVE_FLOAT +SatelliteAzimuthAngle : H5T_NATIVE_FLOAT +Height : H5T_NATIVE_FLOAT +SatelliteRange : H5T_NATIVE_FLOAT +SCPosition : H5T_NATIVE_FLOAT +SCVelocity : H5T_NATIVE_FLOAT +SCAttitude : H5T_NATIVE_FLOAT +SCSolarZenithAngle : H5T_NATIVE_FLOAT +SCSolarAzimuthAngle : H5T_NATIVE_FLOAT +ModeScan : H5T_NATIVE_UCHAR +ModeGran : H5T_NATIVE_UCHAR +PadByte1 : H5T_NATIVE_UCHAR +NumberOfScans : H5T_NATIVE_INT +QF1_SCAN_VIIRSSDRGEO : H5T_NATIVE_UCHAR +QF2_VIIRSSDRGEO : H5T_NATIVE_UCHAR

Figure 2.16.7-1, VIIRS M-Band SDR Geolocation UML Diagram

2.16.8 VIIRS M-Band SDR Geolocation Metadata Details

The HDF5 metadata elements associated with the M-Band SDR Geolocation are listed in the CDFCB-X Volume V, Section 4.3, HDF5 (Metadata) Hierarchy. The M-Band SDR geolocation metadata includes all common metadata at the root, product, aggregation, and granule level.

In addition to the common metadata items for the VIIRS Moderate Resolution SDR Geolocation, the items listed in Table 2.16.8-1, VIIRS Moderate Resolution SDR Geolocation Quality Summary Metadata are included as name/value pair items under the granule level metadata attribute “N_Quality_Summary”. The listed name/value pair items in the table are the granule level quality summary flags for the VIIRS M-Band SDR Geolocation.

Table 2.16.8-1, VIIRS M-Band SDR Geolocation Quality Summary Metadata

N_Quality_Summary			
Name	**Value**	**Description**	**Comments**
Percent Missing Data	0 – 100 %	Percentage of missing pixels (e.g., insufficient data for geolocation).	

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N_Quality_Summary			
Name	**Value**	**Description**	**Comments**
Percent Out of Bounds	0 – 100 %	Percentage of out of bounds pixels. For example, pixels could not be geolocated.	
Automatic Quality Flag	0 – 1	Indicates if processing error has occurred.	0 = Passed 1 = Failed

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2.17 VIIRS Imagery Resolution Band SDR

Table 2.17-1, VIIRS Imagery Resolution Band SDRs summarizes the image band channels and their respective data mnemonics. The SDRs are available separately, but they are presented in this section grouped together in order to minimize the repeated information.

Table 2.17-1, VIIRS Imagery Resolution Band SDRs

Data Mnemonic	Description/Purpose
SDRE-VI01-C0030	Band I1 –radiance & reflectance at nominal center wavelength 640 nm.
SDRE-VI02-C0030	Band I2 – radiance & reflectance at nominal center wavelength 865 nm.
SDRE-VI03-C0030	Band I3 – radiance & reflectance at nominal center wavelength 1610 nm.
SDRE-VI04-C0030	Band I4 – radiance & emittance at nominal center wavelength 3740 nm.
SDRE-VI05-C0030	Band I5 – radiance & emittance at nominal center wavelength 11450 nm.

Data Mnemonic	See Table 2.17-1, VIIRS Imagery Resolution Band SDRs
Description/ Purpose	See Table 2.17-1, VIIRS Imagery Resolution Band SDRs The Visible/Infrared Imager/Radiometer Suite (VIIRS) collects visible/infrared imagery and radiometric data. The five image bands are described in this section. The Imagery Resolution Bands (I-Band) are composed of five separate bands with 32 along-track detectors per band. See Section 2.16, VIIRS M-Band SDRs for general information about VIIRS Moderate and Imagery Resolution Band SDRs.
File-Naming Construct	See the CDFCB-X Volume I, D34862-01, Section 3.0 for details.
File Size	Approximately 48,000 KiB per data granule. Approximately 316,800 KiB per geolocation granule. Sizes do not include HDF5 overhead or metadata.
File Format Type	HDF5
Data Content and Data Format	See Section 2.17.1, VIIRS I-Band SDR Data See Section 2.17.5 , VIIRS I-Band SDR Geolocation

2.17.1 VIIRS I-Band SDR Data Content Summary

The VIIRS I-Band SDR data arrays structures are summarized below in Table 2.17.1-1,

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VIIRS I-Band SDR Data Content Summary.

Table 2.17.1-1, VIIRS I-Band SDR Data Content Summary

Name	Description	Data Type	Bands	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
Radiance	Calibrated Top of Atmosphere (TOA) Radiance for each VIIRS pixel	unsigned 16-bit integer	I1-I5	[N*1536, 6400]	[1536, 6400]	W/(m^2 sr μm)
Reflectance	Calibrated Top of Atmosphere (TOA) Reflectance for each VIIRS pixel	unsigned 16-bit integer	I1-I3	[N*1536, 6400]	[1536, 6400]	unitless
BrightnessTemperature	Calibrated Top of Atmosphere (TOA) Brightness Temperature for each VIIRS pixel	unsigned 16-bit integer	I4, I5	[N*1536, 6400]	[1536, 6400]	K
ModeScan	The VIIRS operational mode, reported at the scan level	unsigned 8-bit char	I1-I5	[N*48]	[48]	unitless
ModeGran	The VIIRS operational mode, reported at the granule level	unsigned 8-bit char	I1-I5	[N]	[1]	unitless
PadByte1	Pad byte	unsigned 8-bit char	I1-I5	[N*3]	[3]	unitless
NumberOfScans	Actual number of VIIRS scans that were used to create this granule	32-bit integer	I1-I5	[N]	[1]	unitless
NumberOfMissingPkts	Number of missing packets in scan	32-bit integer	I1-I5	[N*48]	[48]	unitless
NumberOfBadChecksums	Number of packets with bad checksum in scan	32-bit integer	I1-I5	[N*48]	[48]	unitless
NumberOfDiscardedPkts	Number of discarded packets in scan	32-bit integer	I1-I5	[N*48]	[48]	unitless
QF1_VIIRSIBANDSDR	Quality Flag for each pixel	unsigned 8-bit char	I1-I5	[N*1536, 6400]	[1536, 6400]	unitless

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Name	Description	Data Type	Bands	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
QF2_SCAN_SDR	Quality Flag for each Scan (indicates general SDR information)	unsigned 8-bit char	I1-I5	[N*48]	[48]	unitless
QF3_SCAN_RDR	Quality Flag for each Scan (indicates general RDR information)	unsigned 8-bit char	I1-I5	[N*48]	[48]	unitless
QF4_SCAN_SDR	Reduced Quality Indicator	unsigned 8-bit char	I1-I5	[N*1536]	[1536]	unitless
QF5_GRAN_BADDETECTOR	Quality Flag – Bad detector	unsigned 8-bit char	I1-I5	[N*32]	[32]	unitless
RadianceFactors	Radiance scale and offset: 1st array element = scale 2nd array element = offset	32-bit floating point	I1-I5	[N*2]	[2]	unitless, W/(m^2 sr μm)
ReflectanceFactors	Reflectance scale and offset: 1st array element = scale 2nd array element = offset	32-bit floating point	I1-I3	[N*2]	[2]	unitless, unitless
BrightnessTemperatureFactors	Brightness Temperature scale and offset: 1st array element = scale 2nd array element = offset	32-bit floating point	I4, I5	[N*2]	[2]	unitless, kelvin

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2.17.2 VIIRS I-Band SDR Data Product Profile

Table 2.17.2-1, VIIRS I-Band SDR Product Profile - Radiance

Name	Data Size	Dimensions
Radiance	2byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	1536	1536
CrossTrack	No	No	6400	6400

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Calibrated Top of Atmosphere (TOA) Radiance for each VIIRS pixel	0			W/(m^2 sr μm)	Yes	RadianceFactors	unsigned 16-bit integer	NA_UINT16_FILL	65535		
								MISS_UINT16_FILL	65534		
								ONBOARD_PT_UINT16_FILL	65533		
								ONGROUND_PT_UINT16_FILL	65532		
								ERR_UINT16_FILL	65531		
								VDNE_UINT16_FILL	65529		
								SOUB_UINT16_FILL	65528		

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Table 2.17.2.1- 2, VIIRS I-Band SDR Product Profile - Reflectance, Bands 1, 2, 3

Name	Data Size	Dimensions
Reflectance	2byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	1536	1536
CrossTrack	No	No	6400	6400

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Calibrated Top of Atmosphere (TOA) Reflectance for each VIIRS pixel	0			unitless	Yes	ReflectanceFactors	unsigned 16-bit integer	NA_UINT16_FILL	65535		
								MISS_UINT16_FILL	65534		
								ONBOARD_PT_UINT16_FILL	65533		
								ONGROUND_PT_UINT16_FILL	65532		
								ERR_UINT16_FILL	65531		
								VDNE_UINT16_FILL	65529		
								SOUB_UINT16_FILL	65528		

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Table 2.17.2-3, VIIRS I-Band SDR Product Profile - Brightness Temperature, Bands 4, 5

Name	Data Size	Dimensions
BrightnessTemperature	2byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	1536	1536
CrossTrack	No	No	6400	6400

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Calibrated Top of Atmosphere (TOA) Brightness Temperature for each VIIRS pixel	0			kelvin	Yes	BrightnessTemperatureFactors	unsigned 16-bit integer	NA_UINT16_FILL	65535		
								MISS_UINT16_FILL	65534		
								ONBOARD_PT_UINT16_FILL	65533		
								ONGROUND_PT_UINT16_FILL	65532		
								ERR_UINT16_FILL	65531		
								VDNE_UINT16_FILL	65529		
								SOUB_UINT16_FILL	65528		

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Table 2.17.2- 4, VIIRS I-Band SDR Product Profile, Bands 1 - 5

Name	Data Size	Dimensions
ModeScan	1byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	48	48

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
The VIIRS operational mode, reported at the scan level	0			unitless	No		unsigned 8-bit char	**Name**	**Value**	**Name**	**Value**
								MISS_UINT8_FILL	254	Night	0
								ERR_UINT8_FILL	251	Day	1
								VDNE_UINT8_FILL	249		

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	1	1

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
The VIIRS operational mode, reported at the granule level	0			unitless	No		unsigned 8-bit char	**Name**	**Value**	**Name**	**Value**
								MISS_UINT8_FILL	254	Night	0
								ERR_UINT8_FILL	251	Day	1
								VDNE_UINT8_FILL	249	Mixed	2

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	3	3

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Pad byte	0			unitless	No		unsigned 8-bit char	**Name**	**Value**	**Name**	**Value**

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
NumberOfScans	4byte(s)			

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		Granule	Yes	No	1	1							
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Actual number of VIIRS scans that were used to create this granule	0			unitless	No		32-bit integer	**Name**	**Value**	**Name**	**Value**
NumberOfMissingPkts	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**							
		Scan	Yes	No	48	48							
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Number of missing packets in scan	0			unitless	No		32-bit integer	**Name**	**Value**	**Name**	**Value**
										MISS_INT32_FILL	-998		
										VDNE_INT32_FILL	-993		
NumberOfBadChecksums	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**							
		Scan	Yes	No	48	48							
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Number of packets with bad checksums in scan	0			unitless	No		32-bit integer	**Name**	**Value**	**Name**	**Value**
										MISS_INT32_FILL	-998		
										VDNE_INT32_FILL	-993		
NumberOfDiscardedPkts	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**							
		Scan	Yes	No	48	48							
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Number of	0			unitless	No		32-bit	**Name**	**Value**	**Name**	**Value**

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		discarded packets in scan							integer	MISS_INT32_FILL VDNE_INT32_FILL	-998 -993	

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Table 2.17.2-5, VIIRS I-Band SDR Product Profile - Quality Flags

Name	Data Size	Dimensions
QF1_VIIRSIBANDSDR	1byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	1536	1536
CrossTrack	No	No	6400	6400

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values (Name / Value)	Legend Entries (Name / Value)
SDR Quality - Indicates calibration quality due to bad space view offsets, OBC view offsets, etc or use of a previous calibration view	0			unitless	No		2 bit(s)		Good: 0 Poor: 1 No Calibration: 2
Saturated Pixel - Indicates the level of pixel saturation	2			unitless	No		2 bit(s)		None Saturated: 0 Some Saturated: 1 All Saturated: 2
Missing Data - Data required for calibration processing is not available for processing	4			unitless	No		2 bit(s)		All data present: 0 EV RDR data missing: 1 Cal data (SV, CV, SD, etc.) missing: 2 Thermistor data missing: 3
Out of Range - Calibrated pixel value outside of LUT threshold	6			unitless	No		2 bit(s)		All data within range: 0

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		limits									Radiance out of range	1
											Reflectance or EBBT out of range	2
											Both Radiance and Reflectance or EBBT out of range	3

QF2_SCAN_SDR — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	48	48

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Half Angle Mirror Side	0			unitless	No		1 bit(s)	Name	Value	Name	Value
										A-Side	0
										B-Bide	1
The Moon has corrupted the space view	1			unitless	No		1 bit(s)	Name	Value	Name	Value
										False	0
										True	1
Spare	2			unitless	No		6 bit(s)	Name	Value	Name	Value

QF3_SCAN_RDR — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	48	48

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Checksum failed for zone 1	0			unitless	No		1 bit(s)	Name	Value	Name	Value
										False	0
										True	1
Checksum failed for zone 2	1			unitless	No		1 bit(s)	Name	Value	Name	Value
										False	0
										True	1
Checksum failed for zone	2			unitless	No		1 bit(s)	Name	Value	Name	Value

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		3									False True	0 1
		Checksum failed for zone 4	3			unitless	No		1 bit(s)	**Name** **Value**	**Name** **Value** False True	 0 1
		Checksum failed for zone 5	4			unitless	No		1 bit(s)	**Name** **Value**	**Name** **Value** False True	 0 1
		Checksum failed for zone 6	5			unitless	No		1 bit(s)	**Name** **Value**	**Name** **Value** False True	 0 1
		Scan data is not Present (No valid data)	6			unitless	No		1 bit(s)	**Name** **Value**	**Name** **Value** False True	 0 1
		Spare	7			unitless	No		1 bit(s)	**Name** **Value**	**Name** **Value**	
QF4_SCAN_SDR	1byte(s)	**Name** / **Granule Boundary** / **Dynamic** / **Min Array Size** / **Max Array Size** AlongTrack / Yes / No / 1536 / 1536										
		Datum										
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**	**Legend Entries**	
		Quality for this scan-line is reduced. The value is determined by the combined number of steps required to find a replacement for thermistor or calibration source data	0			unitless	No		unsigned 8-bit char	**Name** **Value**	**Name** **Value** False True	 0 >1
QF5_GRAN_BADDETECTOR	1byte(s)	**Name** / **Granule Boundary** / **Dynamic** / **Min Array Size** / **Max Array Size** Detector / Yes / No / 32 / 32										
		Datum										
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**	**Legend Entries**	
		Bad Detector	0			unitless	No		1 bit(s)	**Name** **Value**	**Name** **Value**	

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											False	0
											True	1
		Spare	1			unitless	No		7 bit(s)	**Name** **Value**	**Name**	**Value**

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Table 2.17.2- 6, VIIRS I-Band SDR Product Profile - Factors, as applicable

Name	Data Size	Dimensions
RadianceFactors	4byte(s)	**Name**: Factors; **Granule Boundary**: Yes; **Dynamic**: No; **Min Array Size**: 2; **Max Array Size**: 2 **Datum**: Description: Scale = first array element; offset = second array element; Datum Offset: 0; Unscaled Valid Range Min: ; Unscaled Valid Range Max: ; Measurement Units: Scale = unitless; Offset = W/(m^2 sr μm); Scaled: No; Scale Factor Name: ; Data Type: 32-bit floating point; Fill Values: Name, Value; Legend Entries: Name, Value
ReflectanceFactors	4byte(s)	**Name**: Factors; **Granule Boundary**: Yes; **Dynamic**: No; **Min Array Size**: 2; **Max Array Size**: 2 **Datum**: Description: Scale = first array element; offset = second array element; Datum Offset: 0; Unscaled Valid Range Min: ; Unscaled Valid Range Max: ; Measurement Units: unitless; Scaled: No; Scale Factor Name: ; Data Type: 32-bit floating point; Fill Values: Name, Value; Legend Entries: Name, Value
BrightnessTemperatureFactors	4byte(s)	**Name**: Factors; **Granule Boundary**: Yes; **Dynamic**: No; **Min Array Size**: 2; **Max Array Size**: 2 **Datum**: Description: Scale = first array element; offset = second array element; Datum Offset: 0; Unscaled Valid Range Min: ; Unscaled Valid Range Max: ; Measurement Units: Scale = unitless; Offset = K; Scaled: No; Scale Factor Name: ; Data Type: 32-bit floating point; Fill Values: Name, Value; Legend Entries: Name, Value

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2.17.3 VIIRS I-Band SDR HDF5 Details

VIIRS-I[1,2,3]-SDR
+Radiance : H5T_NATIVE_USHORT +Reflectance : H5T_NATIVE_USHORT +ModeScan : H5T_NATIVE_UCHAR +ModeGran : H5T_NATIVE_UCHAR +PadByte1 : H5T_NATIVE_UCHAR +NumberOfScans : H5T_NATIVE_INT +NumberOfMissingPkts : H5T_NATIVE_INT +NumberOfBadChecksums : H5T_NATIVE_INT +NumberOfDiscardedPkts : H5T_NATIVE_INT +QF1_VIIRSIBANDSDR : H5T_NATIVE_UCHAR +QF2_SCAN_SDR : H5T_NATIVE_UCHAR +QF3_SCAN_RDR : H5T_NATIVE_UCHAR +QF4_SCAN_SDR : H5T_NATIVE_UCHAR +QF5_GRAN_BADDETECTOR : H5T_NATIVE_UCHAR +RadianceFactors : H5T_NATIVE_FLOAT +ReflectanceFactors : H5T_NATIVE_FLOAT

Figure 2.17.3-1, VIIRS I-Band SDR UML Diagram for Bands 1, 2, 3

VIIRS-I[4,5]-SDR
+Radiance : H5T_NATIVE_USHORT +BrightnessTemperature : H5T_NATIVE_USHORT +ModeScan : H5T_NATIVE_UCHAR +ModeGran : H5T_NATIVE_UCHAR +PadByte1 : H5T_NATIVE_UCHAR +NumberOfScans : H5T_NATIVE_INT +NumberOfMissingPkts : H5T_NATIVE_INT +NumberOfBadChecksums : H5T_NATIVE_INT +NumberOfDiscardedPkts : H5T_NATIVE_INT +QF1_VIIRSIBANDSDR : H5T_NATIVE_UCHAR +QF2_SCAN_SDR : H5T_NATIVE_UCHAR +QF3_SCAN_RDR : H5T_NATIVE_UCHAR +QF4_SCAN_SDR : H5T_NATIVE_UCHAR +QF5_GRAN_BADDETECTOR : H5T_NATIVE_UCHAR +RadianceFactors : H5T_NATIVE_FLOAT +BrightnessTemperatureFactors : H5T_NATIVE_FLOAT

Figure 2.17.3-2, VIIRS I-Band SDR UML Diagram for Bands 4, 5

2.17.4 VIIRS I-Band SDR Metadata Details

The HDF5 metadata elements associated with the I-Band SDRs are listed in the CDFCB-X Volume V, Section 4.3, HDF5 (Metadata) Hierarchy. The I-Band SDR metadata includes all common metadata at the root, product, aggregation, and granule level.

In addition to the common metadata items for the VIIRS Imagery Resolution SDR, the items listed in Table 2.16.4-1, VIIRS Imagery Resolution SDR Quality Summary

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Metadata are included as name/value pair items under the granule level metadata attribute “N_Quality_Summary”. The listed name/value pair items in the table are the granule level quality summary flags for the VIIRS I-Band SDRs.

Note that there is a standard granule level metadata item that identifies the Imagery Band. This metadata item is the “Band_ID” and is set to “I1”, “I2”, “I3”, …”I5”.

Table 2.17.4-1, VIIRS Imagery Resolution SDR Quality Summary Metadata Values

N_Quality_Summary			
Name	**Value**	**Description**	**Comments**
Summary VIIRS SDR Quality	0 – 100 %	Percentage of good quality pixels in granule	
Scan Quality Exclusion	0 – 48	Number of scans in granule excluded from processing (including partial scans)	

2.17.5 VIIRS I-Band SDR Geolocation Content Summary

The VIIRS I-Band SDR Geolocation arrays structures are summarized below in Table 2.17.5-1, VIIRS I-Band SDR Geolocation Content Summary.

Table 2.17.5-1, VIIRS I-Band SDR Geolocation Content Summary

Name	Description	Data Type	Aggregate Dimensions	Granule Dimensions	Units
StartTime	Starting Time of each scan in IET (1/1/1958)	64-bit integer	[N*48]	[48]	microsecond
MidTime	Mid-Time of each scan in IET (1/1/1958)	64-bit integer	[N*48]	[48]	microsecond
Latitude	Latitude of each pixel (positive North)	32-bit floating point	[N*1536, 6400]	[1536, 6400]	degree
Longitude	Longitude of each pixel (positive East)	32-bit floating point	[N*1536, 6400]	[1536, 6400]	degree
SolarZenithAngle	Zenith angle of sun at each pixel position	32-bit floating point	[N*1536, 6400]	[1536, 6400]	degree

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Name	Description	Data Type	Aggregate Dimensions	Granule Dimensions	Units
SolarAzimuthAngle	Azimuth angle of sun (measured clockwise positive from North) at each pixel position	32-bit floating point	[N*1536, 6400]	[1536, 6400]	degree
SatelliteZenithAngle	Zenith angle to Satellite at each pixel position	32-bit floating point	[N*1536, 6400]	[1536, 6400]	degree
SatelliteAzimuthAngle	Azimuth angle (measured clockwise positive from North) to Satellite at each pixel position	32-bit floating point	[N*1536, 6400]	[1536, 6400]	degree
Height	Ellipsoid-Geoid separation	32-bit floating point	[N*1536, 6400]	[1536, 6400]	meter
SatelliteRange	Line of sight distance from the ellipsoid intersection to the satellite	32-bit floating point	[N*1536, 6400]	[1536, 6400]	meter
SCPosition	Spacecraft position in ECR Coordinates (X, Y, Z) at the mid-time of scan	32-bit floating point	[N*48, 3]	[48, 3]	meter
SCVelocity	Spacecraft velocity in ECR Coordinates (dx/dt, dy/dt, dz/dt) at the mid-time of scan	32-bit floating point	[N*48, 3]	[48, 3]	m/s
SCAttitude	Spacecraft attitude with respect to Geodetic Reference Frame Coordinates (roll, pitch, yaw) at the mid-time of scan	32-bit floating point	[N*48, 3]	[48, 3]	arcsecond

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Name	Description	Data Type	Aggregate Dimensions	Granule Dimensions	Units
SCSolarZenithAngle	The angle from the normal vector of the Solar Diffuser surface (z-axis of the solar diffuser frame) to the solar vector	32-bit floating point	[N*48]	[48]	degree
SCSolarAzimuthAngle	The angle from the Solar Diffuser reference frame x-axis to the projection of the solar vector onto the solar diffuser surface (x-y plane), measured counterclockwise (observer looking toward the SD surface)	32-bit floating point	[N*48]	[48]	degree
ModeScan	The VIIRS operational mode, reported at the scan level	unsigned 8-bit char	[N*48]	[48]	unitless
ModeGran	The VIIRS operational mode, reported at the granule level	unsigned 8-bit char	[N]	[1]	unitless
PadByte1	Pad byte	unsigned 8-bit char	[N*3]	[3]	unitless
NumberOfScans	Actual number of VIIRS scans that were used to create this granule	32-bit integer	[N]	[1]	unitless
QF1_SCAN_VIIRSSDRGEO	Scan-level quality flag	unsigned 8-bit char	[N*48]	[48]	unitless
QF2_VIIRSSDRGEO	Pixel-level quality flag	unsigned 8-bit char	[N*1536, 6400]	[1536,6400]	unitless

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2.17.6 VIIRS I-Band SDR Geolocation Product Profile

Table 2.17.6-1, VIIRS I-Band SDR Geolocation Product Profile

Name	Data Size	Dimensions
StartTime	8byte(s)	
MidTime	8byte(s)	
Latitude	4byte(s)	

StartTime — Dimensions

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	48	48

StartTime — Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Starting Time of each scan in IET (1/1/1958)	0			microsecond	No		64-bit integer	NA_INT64_FILL	-999		
								MISS_INT64_FILL	-998		
								ERR_INT64_FILL	-995		
								VDNE_INT64_FILL	-993		

MidTime — Dimensions

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	48	48

MidTime — Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Mid-Time of each scan in IET (1/1/1958)	0			microsecond	No		64-bit integer	NA_INT64_FILL	-999		
								MISS_INT64_FILL	-998		
								ERR_INT64_FILL	-995		
								VDNE_INT64_FILL	-993		

Latitude — Dimensions

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	1536	1536
CrossTrack	No	No	6400	6400

Latitude — Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries

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		Latitude of each pixel (positive North)	0	-90	90	degree	No		32-bit floating point	**Name** / **Value**: NA_FLOAT32_FILL -999.9; MISS_FLOAT32_FILL -999.8; ERR_FLOAT32_FILL -999.5; ELINT_FLOAT32_FILL -999.4; VDNE_FLOAT32_FILL -999.3	**Name** / **Value**		
Longitude	4byte(s)	**Name** / **Granule Boundary** / **Dynamic** / **Min Array Size** / **Max Array Size**: AlongTrack, Yes, No, 1536, 1536; CrossTrack, No, No, 6400, 6400											
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Longitude of each pixel (positive East)	0	-180	180	degree	No		32-bit floating point	**Name** / **Value**: NA_FLOAT32_FILL -999.9; MISS_FLOAT32_FILL -999.8; ERR_FLOAT32_FILL -999.5; ELINT_FLOAT32_FILL -999.4; VDNE_FLOAT32_FILL -999.3	**Name** / **Value**		
SolarZenithAngle	4byte(s)	**Name** / **Granule Boundary** / **Dynamic** / **Min Array Size** / **Max Array Size**: AlongTrack, Yes, No, 1536, 1536; CrossTrack, No, No, 6400, 6400											
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Zenith angle of sun at each pixel position	0	0	180	degree	No		32-bit floating point	**Name** / **Value**: NA_FLOAT32_FILL -999.9; MISS_FLOAT32_FILL -999.8; ERR_FLOAT32_FILL -999.5; ELINT_FLOAT32_FILL -999.4; VDNE_FLOAT32_FILL -999.3	**Name** / **Value**		
SolarAzimuthAngle	4byte(s)	**Name** / **Granule Boundary** / **Dynamic** / **Min Array Size** / **Max Array Size**											

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		AlongTrack	Yes		No	1536	1536					
		CrossTrack	No		No	6400	6400					
		Datum										
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**
		Azimuth angle of sun (measured clockwise positive from North) at each pixel position	0	-180	180	degree	No		32-bit floating point	**Name**	**Value**	**Name** **Value**
										NA_FLOAT32_FILL	-999.9	
										MISS_FLOAT32_FILL	-999.8	
										ERR_FLOAT32_FILL	-999.5	
										ELINT_FLOAT32_FILL	-999.4	
										VDNE_FLOAT32_FILL	-999.3	
SatelliteZenithAngle	4byte(s)	**Name**	**Granule Boundary**		**Dynamic**	**Min Array Size**	**Max Array Size**					
		AlongTrack	Yes		No	1536	1536					
		CrossTrack	No		No	6400	6400					
		Datum										
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**
		Zenith angle to Satellite at each pixel position	0	0	~70	degree	No		32-bit floating point	**Name**	**Value**	**Name** **Value**
										NA_FLOAT32_FILL	-999.9	
										MISS_FLOAT32_FILL	-999.8	
										ERR_FLOAT32_FILL	-999.5	
										ELINT_FLOAT32_FILL	-999.4	
										VDNE_FLOAT32_FILL	-999.3	
SatelliteAzimuthAngle	4byte(s)	**Name**	**Granule Boundary**		**Dynamic**	**Min Array Size**	**Max Array Size**					
		AlongTrack	Yes		No	1536	1536					
		CrossTrack	No		No	6400	6400					
		Datum										
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**
		Azimuth angle	0	-180	180	degree	No		32-bit	**Name**	**Value**	**Name** **Value**

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		(measured clockwise positive from North) to Satellite at each pixel position							floating point	NA_FLOAT32_FILL	-999.9	
										MISS_FLOAT32_FILL	-999.8	
										ERR_FLOAT32_FILL	-999.5	
										ELINT_FLOAT32_FILL	-999.4	
										VDNE_FLOAT32_FILL	-999.3	

Height — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	1536	1536
CrossTrack	No	No	6400	6400

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Ellipsoid-Geoid separation	0			meter	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								ELINT_FLOAT32_FILL	-999.4		
								VDNE_FLOAT32_FILL	-999.3		

SatelliteRange — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	1536	1536
CrossTrack	No	No	6400	6400

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Line of sight distance from the ellipsoid intersection to the satellite	0			meter	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								ELINT_FLOAT32_FILL	-999.4		
								VDNE_FLOAT32_FILL	-999.3		

SCPosition — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	48	48

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		ECRCoordinate	No		No	3		3						
		Datum												
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**		
		Spacecraft position in ECR Coordinates (X, Y, Z) at the mid-time of scan	0			meter	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**	
										NA_FLOAT32_FILL	-999.9			
										MISS_FLOAT32_FILL	-999.8			
										ERR_FLOAT32_FILL	-999.5			
										VDNE_FLOAT32_FILL	-999.3			
SCVelocity	4byte(s)	**Name**	**Granule Boundary**		**Dynamic**	**Min Array Size**		**Max Array Size**						
		Scan	Yes		No	48		48						
		ECRCoordinate	No		No	3		3						
		Datum												
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**		
		Spacecraft velocity in ECR Coordinates (dx/dt, dy/dt, dz/dt) at the mid-time of scan	0			m/s	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**	
										NA_FLOAT32_FILL	-999.9			
										MISS_FLOAT32_FILL	-999.8			
										ERR_FLOAT32_FILL	-999.5			
										VDNE_FLOAT32_FILL	-999.3			
SCAttitude	4byte(s)	**Name**	**Granule Boundary**		**Dynamic**	**Min Array Size**		**Max Array Size**						
		Scan	Yes		No	48		48						
		GRFCoordinate	No		No	3		3						
		Datum												
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**		
		Spacecraft attitude with respect to Geodetic	0			arcsecond	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**	
										NA_FLOAT32_FILL	-999.9			
										MISS_FLOAT32_FILL	-999.8			

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		Reference Frame Coordinates (roll, pitch, yaw) at the mid-time of scan								ERR_FLOAT32_FILL -999.5 VDNE_FLOAT32_FILL -999.3		
SCSolarZenithAngle	4byte(s)	**Name** / **Granule Boundary** / **Dynamic** / **Min Array Size** / **Max Array Size** Scan / Yes / No / 48 / 48										
		Datum										
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**	**Legend Entries**	
		The angle from the normal vector of the Solar Diffuser surface (z-axis of the solar diffuser frame) to the solar vector	0	0	180	degree	No		32-bit floating point	**Name** / **Value** NA_FLOAT32_FILL -999.9 MISS_FLOAT32_FILL -999.8 ERR_FLOAT32_FILL -999.5 VDNE_FLOAT32_FILL -999.3	**Name** / **Value**	
SCSolarAzimuthAngle	4byte(s)	**Name** / **Granule Boundary** / **Dynamic** / **Min Array Size** / **Max Array Size** Scan / Yes / No / 48 / 48										
		Datum										
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**	**Legend Entries**	
		The angle from the Solar Diffuser reference frame x-axis to the projection of the solar vector onto the solar diffuser surface (x-y plane), measured counterclockwise (observer looking toward the SD surface)	0	-180	180	degree	No		32-bit floating point	**Name** / **Value** NA_FLOAT32_FILL -999.9 MISS_FLOAT32_FILL -999.8 ERR_FLOAT32_FILL -999.5 VDNE_FLOAT32_FILL -999.3	**Name** / **Value**	

ModeScan — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	48	48

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
The VIIRS operational mode, reported at the scan level.	0			unitless	No		unsigned 8-bit char	MISS_UINT8_FILL	254	Night	0
								ERR_UINT8_FILL	251	Day	1
								VDNE_UINT8_FILL	249		

ModeGran — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	1	1

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
The VIIRS operational mode, reported at the granule level.	0			unitless	No		unsigned 8-bit char	MISS_UINT8_FILL	254	Night	0
								ERR_UINT8_FILL	251	Day	1
								VDNE_UINT8_FILL	249	Mixed	2

PadByte1 — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	3	3

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Pad byte	0			unitless	No		unsigned 8-bit char				

NumberOfScans — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	1	1

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Actual number of VIIRS scans that were	0			unitless	No		32-bit integer				

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		used to create this granule.									

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Table 2.17.6- 2, VIIRS I-Band Geolocation Product Profile - Quality Flags

Name	Data Size	Dimensions
QF1_SCAN_VIIRSSDRGEO	1byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	48	48

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Attitude and Ephemeris availability status	0			unitless	No		2 bit(s)			Nominal - E&A data available	0
										Missing Data <= Small Gap	1
										Small Gap < Missing Data <= Granule Boundary	2
										Missing Data > Granule Boundary	3
HAM/RTA Encoder Flag - Indicates the quality of the HAM and RTA encoder timestamps	2			unitless	No		2 bit(s)			Good Data	0
										Bad Data – either HAM, RTA, or both are bad for the entire scan.	1
										Degraded Data – either HAM, RTA, or both are corrupted within the scan.	2
										Missing Data – Missing	3

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											encoder data for the scan	
		Within South Atlantic Anomaly	4			unitless	No		1 bit(s)	**Name** **Value**	**Name** **Value** False 0 True 1	
		Solar Eclipse during Earth view scan	5			unitless	No		1 bit(s)	**Name** **Value**	**Name** **Value** False 0 True 1	
		Spare	6			unitless	No		2 bit(s)	**Name** **Value**	**Name** **Value**	

QF2_VIIRSSDRGEO — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	1536	1536
CrossTrack	No	No	6400	6400

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries
Invalid Input Data (Indicates that any of the Spacecraft Ephemeris or Attitude Data is Invalid or the encoder data is invalid)	0			unitless	No		1 bit(s)	**Name** **Value**	**Name** **Value** False 0 True 1
Bad Pointing (Indicates that the sensor LOS does not intersect the geoid, is near the limb, has invalid sensor angles or other similar condition)	1			unitless	No		1 bit(s)	**Name** **Value**	**Name** **Value** False 0 True 1
Bad Terrain (Indicates that the algorithm could not obtain a valid terrain value)	2			unitless	No		1 bit(s)	**Name** **Value**	**Name** **Value** False 0 True 1
Invalid Solar Angles	3			unitless	No		1 bit(s)	**Name** **Value**	**Name** **Value** False 0 True 1

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		Spare	4			unitless	No		4 bit(s)	**Name**	**Value**	**Name**	**Value**

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2.17.7 VIIRS I-Band SDR Geolocation HDF5 Details

VIIRS-IMG-GEO
+StartTime : H5T_NATIVE_LLONG +MidTime : H5T_NATIVE_LLONG +Latitude : H5T_NATIVE_FLOAT +Longitude : H5T_NATIVE_FLOAT +SolarZenithAngle : H5T_NATIVE_FLOAT +SolarAzimuthAngle : H5T_NATIVE_FLOAT +SatelliteZenithAngle : H5T_NATIVE_FLOAT +SatelliteAzimuthAngle : H5T_NATIVE_FLOAT +Height : H5T_NATIVE_FLOAT +SatelliteRange : H5T_NATIVE_FLOAT +SCPosition : H5T_NATIVE_FLOAT +SCVelocity : H5T_NATIVE_FLOAT +SCAttitude : H5T_NATIVE_FLOAT +SCSolarZenithAngle : H5T_NATIVE_FLOAT +SCSolarAzimuthAngle : H5T_NATIVE_FLOAT +ModeScan : H5T_NATIVE_UCHAR +ModeGran : H5T_NATIVE_UCHAR +PadByte1 : H5T_NATIVE_UCHAR +NumberOfScans : H5T_NATIVE_INT +QF1_SCAN_VIIRSSDRGEO : H5T_NATIVE_UCHAR +QF2_VIIRSSDRGEO : H5T_NATIVE_UCHAR

Figure 2.17.7-1, VIIRS I-Band SDR Geolocation UML Diagram

2.17.8 VIIRS I-Band SDR Geolocation Metadata Details

The HDF5 metadata elements associated with the I-Band SDR Geolocation are listed in the CDFCB-X Volume V, Section 4.3, HDF5 (Metadata) Hierarchy. The I-Band SDR geolocation metadata includes all common metadata at the root, product, aggregation, and granule level.

In addition to the common metadata items for the VIIRS Imagery Resolution SDR Geolocation, the items listed in Table 2.17.8-1, VIIRS Imagery Resolution SDR Geolocation Quality Summary Metadata are included as name/value pair items under the granule level metadata attribute “N_Quality_Summary”. The listed name/value pair items in the table are the granule level quality summary flags for the VIIRS I-Band SDR Geolocation.

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Table 2.17.8-1, VIIRS Imagery Resolution SDR Geolocation Quality Summary Metadata

N_Quality_Summary			
Name	**Value**	**Description**	**Comments**
Percent Missing Data	0 – 100 %	Percentage of missing pixels (e.g., insufficient data for geolocation).	
Percent Out of Bounds	0 – 100 %	Percentage of out of bounds pixels. For example, pixels could not be geolocated.	
Automatic Quality Flag	0 – 1	Indicates if processing error has occurred.	0 = Passed 1 = Failed

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2.18 VIIRS Day/Night Band (DNB) SDR

Data Mnemonic	SDRE-VDNB-C0030
Description/ Purpose	The Visible/Infrared Imaging/Radiometer Suite (VIIRS) collects visible/infrared imagery and radiometric data. The Day/Night Band (DNB) is described in this section. VIIRS DNB measures radiance over a panchromatic band at wavelengths between 500 nm and 900 nm. For more information on the VIIRS SDR data see Section 2.16, VIIRS M-Band SDRs, sub-section Description/Purpose, *General Information on VIIRS SDRs*. Day/Night Band (DNB) sub-pixels are aggregated on-board and are not subject to pixel trim effects. The DNB pixels maintain a near constant projected spatial size with scan angle.
File-Naming Construct	See the CDFCB-X Volume I, D34862-01, Section 3.0 for details.
File Size	Approximately 15,240 KiB per data granule. Approximately 124,970 KiB per geolocation granule. Sizes do not include HDF5 overhead or metadata.
File Format Type	HDF5
Data Content and Data Format	See Section 2.18.1, VIIRS DNB SDR Data See Section 2.18.5, VIIRS DNB SDR Geolocation

2.18.1 VIIRS DNB SDR Data Content Summary

The VIIRS DNB SDR data arrays structures are summarized below in Table 2.18.1-1, VIIRS DNB SDR Data Content Summary.

Table 2.18.1-1, VIIRS DNB SDR Data Content Summary

Name	Description	Data Type	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
Radiance	Calibrated Top of Atmosphere (TOA) Radiance for each VIIRS DNB pixel	32-bit floating point	[N*768,4064]	[768, 4064]	W/(cm^2 sr)

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Name	Description	Data Type	Aggregate Dimensions (N = Number of Granules)	Granule Dimensions	Units
ModeScan	The VIIRS operational mode, reported at the scan level	unsigned 8-bit char	[N*48]	[48]	unitless
ModeGran	The VIIRS operational mode, reported at the granule level	unsigned 8-bit char	[N]	[1]	unitless
PadByte1	Pad byte	unsigned 8-bit char	[N*3]	[3]	unitless
NumberOfScans	Actual number of VIIRS scans in granule.	32-bit integer	[N]	[1]	unitless
NumberOfMissingPkts	Number of missing packets in scan	32-bit integer	[N*48]	[48]	unitless
NumberOfBadChecksums	Number of packets with bad checksum in scan	32-bit integer	[N*48]	[48]	unitless
NumberOfDiscardedPkts	Number of discarded packets in scan	32-bit integer	[N*48]	[48]	unitless
QF1_VIIRSDNBSDR	Pixel-level Quality Flag	unsigned 8-bit char	[N*768,4064]	[768, 4064]	unitless
QF2_SCAN_SDR	Quality Flag for each Scan (indicates general SDR information)	unsigned 8-bit char	[N*48]	[48]	unitless
QF3_SCAN_RDR	Quality Flag for each Scan (indicates general RDR information)	unsigned 8-bit char	[N*48]	[48]	unitless

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2.18.2 VIIRS DNB SDR Data Product Profile

Table 2.18.2-1, VIIRS DNB Band SDR Product Profile

Name	Data Size	Dimensions
Radiance	4byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	768	768
CrossTrack	No	No	4064	4064

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Calibrated Top of Atmosphere (TOA) Radiance for each VIIRS DNB pixel	0			W/(cm^2 sr)	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

ModeScan	1byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	48	48

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
The VIIRS operational mode, reported at the scan level	0			unitless	No		unsigned 8-bit char	MISS_UINT8_FILL	254	Night	0
								ERR_UINT8_FILL	251	Day	1
								VDNE_UINT8_FILL	249		

ModeGran	1byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	1	1

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries

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		The VIIRS operational mode, reported at the granule level	0			unitless	No		unsigned 8-bit char	**Name**	**Value**	**Name**	**Value**
										MISS_UINT8_FILL	254	Night	0
										ERR_UINT8_FILL	251	Day	1
										VDNE_UINT8_FILL	249	Mixed	2

PadByte1 — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	3	3

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Pad byte	0			unitless	No		unsigned 8-bit char	**Name**	**Value**	**Name**	**Value**

NumberOfScans — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	1	1

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Actual number of VIIRS scans that were used to create this granule	0			unitless	No		32-bit integer	**Name**	**Value**	**Name**	**Value**

NumberOfMissingPkts — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	48	48

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Number of missing packets in scan	0			unitless	No		32-bit integer	**Name**	**Value**	**Name**	**Value**
								MISS_INT32_FILL	-998		
								VDNE_INT32_FILL	-993		

NumberOfBadChecksums — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	48	48

Datum

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		Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
		Number of packets with bad checksums in scan	0			unitless	No		32-bit integer	**Name**	**Value**	**Name**	**Value**
										MISS_INT32_FILL	-998		
										VDNE_INT32_FILL	-993		

		Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
NumberOfDiscardedPkts	4byte(s)	Scan	Yes	No	48	48

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Number of discarded packets in scan	0			unitless	No		32-bit integer	**Name**	**Value**	**Name**	**Value**
								MISS_INT32_FILL	-998		
								VDNE_INT32_FILL	-993		

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Table 2.18.2-2, VIIRS DNB Band SDR Product Profile - Quality Flags

Name	Data Size	Dimensions
QF1_VIIRSDNBSDR	1byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	768	768
CrossTrack	No	No	4064	4064

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values (Name / Value)	Legend Entries (Name / Value)
SDR Quality - Indicates calibration quality due to bad space view offsets, OBC view offsets, etc or use of a previous calibration view	0			unitless	No		2 bit(s)		Good: 0 Poor: 1 No Calibration: 2
Saturated Pixel - Indicates the level of pixel saturation	2			unitless	No		2 bit(s)		None Saturated: 0 Some Saturated: 1 All Saturated: 2
Missing Data - Data required for calibration processing is not available for processing	4			unitless	No		2 bit(s)		All data present: 0 EV RDR data missing: 1 Cal data (SV, CV, SD, etc.) missing: 2 Thermistor data missing: 3
Out of Range - Calibrated pixel value outside of LUT threshold limits	6			unitless	No		1 bit(s)		All data within range: 0 Radiance out of range: 1
Spare	7			unitless	No		1 bit(s)		

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QF2_SCAN_SDR	1byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**					
		Scan	Yes	No	48	48					
		Datum									
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**	**Legend Entries**
		Half Angle Mirror Side	0			unitless	No		1 bit(s)	**Name** **Value**	**Name** **Value** A-Side 0 B-Side 1
		The Moon has corrupted the space view	1			unitless	No		1 bit(s)	**Name** **Value**	**Name** **Value** False 0 True 1
		Spare	2			unitless	No		6 bit(s)	**Name** **Value**	**Name** **Value**
QF3_SCAN_RDR	1byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**					
		Scan	Yes	No	48	48					
		Datum									
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**	**Legend Entries**
		Checksum failed for zone 1	0			unitless	No		1 bit(s)	**Name** **Value**	**Name** **Value** False 0 True 1
		Checksum failed for zone 2	1			unitless	No		1 bit(s)	**Name** **Value**	**Name** **Value** False 0 True 1
		Checksum failed for zone 3	2			unitless	No		1 bit(s)	**Name** **Value**	**Name** **Value** False 0 True 1
		Checksum failed for zone 4	3			unitless	No		1 bit(s)	**Name** **Value**	**Name** **Value** False 0 True 1
		Checksum failed for zone 5	4			unitless	No		1 bit(s)	**Name** **Value**	**Name** **Value** False 0 True 1
		Checksum failed for zone 6	5			unitless	No		1 bit(s)	**Name** **Value**	**Name** **Value** False 0 True 1

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		Scan data is not Present (No valid data)	6			unitless	No		1 bit(s)	**Name**	**Value**	**Name**	**Value**	
												False	0	
												True	1	
		Spare	7			unitless	No		1 bit(s)	**Name**	**Value**	**Name**	**Value**	

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2.18.3 VIIRS DNB SDR Data HDF5 Details

VIIRS-DNB-SDR
+Radiance : H5T_NATIVE_FLOAT +ModeScan : H5T_NATIVE_UCHAR +ModeGran : H5T_NATIVE_UCHAR +PadByte1 : H5T_NATIVE_UCHAR +NumberOfScans : H5T_NATIVE_INT +NumberOfMissingPkts : H5T_NATIVE_INT +NumberOfBadChecksums : H5T_NATIVE_INT +NumberOfDiscardedPkts : H5T_NATIVE_INT +QF1_VIIRSDNBSDR : H5T_NATIVE_UCHAR +QF2_SCAN_SDR : H5T_NATIVE_UCHAR +QF3_SCAN_RDR : H5T_NATIVE_UCHAR

Figure 2.18.3-1, VIIRS DNB SDR UML Diagram

2.18.4 VIIRS DNB SDR Data Metadata Details

The HDF5 metadata elements associated with the VIIRS DNB SDRs are listed in the CDFCB-X Volume V, Section 4.3, HDF5 (Metadata) Hierarchy. The DNB SDR metadata includes all common metadata at the root, product, aggregation, and granule level.

In addition to the common metadata items for the VIIRS DNB SDR, the items listed in Table 2.18.4-1, VIIRS DNB SDR Quality Summary Metadata are included as name/value pair items under the granule level metadata attribute “N_Quality_Summary”. The listed name/value pair items in the table are the granule level quality summary flags for the VIIRS DNB SDRs.

Note that there is a standard granule level metadata item that identifies the Imagery Band. This metadata item is the “Band_ID” and is set to “DNB”.

Table 2.18.4-1, VIIRS DNB SDR Quality Summary Metadata Values

N_Quality_Summary			
Name	**Value**	**Description**	**Comments**
Summary VIIRS SDR Quality	0 – 100 %	Percentage of good quality pixels in granule	
Scan Quality Exclusion	0 – 48	Number of scans in granule excluded from processing (including partial scans)	

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2.18.5 VIIRS DNB SDR Geolocation Content Summary

The VIIRS DNB SDR geolocation arrays structures are summarized below in Table 2.18.5-1, VIIRS DNB SDR Geolocation Content Summary.

Table 2.18.5-1, VIIRS DNB SDR Geolocation Content Summary

Name	Description	Data Type	Aggregate Dimensions	Granule Dimensions	Units
StartTime	Starting Time of each scan in IET (1/1/1958)	64-bit integer	[N*48]	[48]	microsecond
MidTime	Mid-Time of each scan in IET (1/1/1958)	64-bit integer	[N*48]	[48]	microsecond
Latitude	Latitude of each pixel (positive North)	32-bit floating point	[N*768, 4064]	[768, 4064]	degree
Longitude	Longitude of each pixel (positive East)	32-bit floating point	[N*768, 4064]	[768, 4064]	degree
SolarZenithAngle	Zenith angle of sun at each pixel position	32-bit floating point	[N*768, 4064]	[768, 4064]	degree
SolarAzimuthAngle	Azimuth angle of sun (measured clockwise positive from North) at each pixel position	32-bit floating point	[N*768, 4064]	[768, 4064]	degree
SatelliteZenithAngle	Zenith angle to Satellite at each pixel position	32-bit floating point	[N*768, 4064]	[768, 4064]	degree
SatelliteAzimuthAngle	Azimuth angle (measured clockwise positive from North) to Satellite at each pixel position	32-bit floating point	[N*768, 4064]	[768, 4064]	degree
LunarZenithAngle	Zenith angle of moon at each pixel position	32-bit floating point	[N*768, 4064]	[768, 4064]	degree
LunarAzimuthAngle	Azimuth angle of moon (measured clockwise positive from North) at each pixel position	32-bit floating point	[N*768, 4064]	[768, 4064]	degree
Height	Ellipsoid-Geoid separation	32-bit floating point	[N*768, 4064]	[768, 4064]	meter
SatelliteRange	Line of sight distance from the ellipsoid intersection to the satellite	32-bit floating point	[N*768, 4064]	[768, 4064]	meter

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Name	Description	Data Type	Aggregate Dimensions	Granule Dimensions	Units
SCPosition	Spacecraft position in ECR Coordinates (X, Y, Z) at the mid-time of scan	32-bit floating point	[N*48,3]	[48, 3]	meter
SCVelocity	Spacecraft velocity in ECR Coordinates (dx/dt, dy/dt, dz/dt) at the mid-time of scan	32-bit floating point	[N*48,3]	[48, 3]	m/s
SCAttitude	Spacecraft attitude with respect to Geodetic Reference Frame Coordinates (roll, pitch, yaw)	32-bit floating point	[N*48, 3]	[48, 3]	arcsecond
SCSolarZenithAngle	The angle from the normal vector of the Solar Diffuser surface (z-axis of the solar diffuser frame) to the solar vector	32-bit floating point	[N*48]	[48]	degree
SCSolarAzimuthAngle	The angle from the Solar Diffuser reference frame x-axis to the projection of the solar vector onto the solar diffuser surface (x-y plane), measured counterclockwise (observer looking toward the SD surface)	32-bit floating point	[N*48]	[48]	degree
MoonPhaseAngle	Angle between ray vector to moon from earth and ray vector of satellite to earth	32-bit floating point	[N]	[1]	degree
MoonIllumFraction	Fraction of the moon illuminated (expressed as percent)	32-bit floating point	[N]	[1]	unitless
ModeScan	The VIIRS operational mode, reported at the scan level	unsigned 8-bit char	[N*48]	[48]	unitless
ModeGran	The VIIRS operational mode, reported at the granule level	unsigned 8-bit char	[N]	[1]	unitless
PadByte1	Pad byte	unsigned 8-bit char	[N*3]	[3]	unitless
NumberOfScans	Actual number of VIIRS scans that were used to create this granule	32-bit integer	[N]	[1]	unitless
QF1_SCAN_VIIRSSDRGEO	Scan-level quality flag	unsigned 8-bit char	[N*48]	[48]	unitless

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Name	Description	Data Type	Aggregate Dimensions	Granule Dimensions	Units
QF2_VIIRSSDRGEO	Pixel-level quality flag	unsigned 8-bit char	[N*768, 4064]	[768,4064]	unitless

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2.18.6 VIIRS DNB SDR Geolocation Product Profile

Table 2.18.6-1, VIIRS DNB SDR Geolocation Product Profile

Name	Data Size	Dimensions
StartTime	8byte(s)	
MidTime	8byte(s)	
Latitude	4byte(s)	

StartTime — Dimensions

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	48	48

StartTime — Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Starting Time of each scan in IET (1/1/1958)	0			microsecond	No		64-bit integer	NA_INT64_FILL	-999		
								MISS_INT64_FILL	-998		
								ERR_INT64_FILL	-995		
								VDNE_INT64_FILL	-993		

MidTime — Dimensions

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	48	48

MidTime — Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Mid-Time of each scan in IET (1/1/1958)	0			microsecond	No		64-bit integer	NA_INT64_FILL	-999		
								MISS_INT64_FILL	-998		
								ERR_INT64_FILL	-995		
								VDNE_INT64_FILL	-993		

Latitude — Dimensions

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	768	768
CrossTrack	No	No	4064	4064

Latitude — Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries

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		Latitude of each pixel (positive North)	0	-90	90	degree	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
										NA_FLOAT32_FILL	-999.9		
										MISS_FLOAT32_FILL	-999.8		
										ERR_FLOAT32_FILL	-999.5		
										ELINT_FLOAT32_FILL	-999.4		
										VDNE_FLOAT32_FILL	-999.3		
Longitude	4byte(s)	**Name**	**Granule Boundary**		**Dynamic**	**Min Array Size**	**Max Array Size**						
		AlongTrack	Yes		No	768	768						
		CrossTrack	No		No	4064	4064						
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Longitude of each pixel (positive East)	0	-180	180	degree	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
										NA_FLOAT32_FILL	-999.9		
										MISS_FLOAT32_FILL	-999.8		
										ERR_FLOAT32_FILL	-999.5		
										ELINT_FLOAT32_FILL	-999.4		
										VDNE_FLOAT32_FILL	-999.3		
SolarZenithAngle	4byte(s)	**Name**	**Granule Boundary**		**Dynamic**	**Min Array Size**	**Max Array Size**						
		AlongTrack	Yes		No	768	768						
		CrossTrack	No		No	4064	4064						
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Zenith angle of sun at each pixel position	0	0	180	degree	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
										NA_FLOAT32_FILL	-999.9		
										MISS_FLOAT32_FILL	-999.8		
										ERR_FLOAT32_FILL	-999.5		
										ELINT_FLOAT32_FILL	-999.4		
										VDNE_FLOAT32_FILL	-999.3		
SolarAzimuthAngle	4byte(s)	**Name**	**Granule Boundary**		**Dynamic**	**Min Array Size**	**Max Array Size**						

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		AlongTrack	Yes		No	768	768					
		CrossTrack	No		No	4064	4064					
		Datum										
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**
		Azimuth angle of sun (measured clockwise positive from North) at each pixel position	0	-180	180	degree	No		32-bit floating point	**Name**	**Value**	**Name** **Value**
										NA_FLOAT32_FILL	-999.9	
										MISS_FLOAT32_FILL	-999.8	
										ERR_FLOAT32_FILL	-999.5	
										ELINT_FLOAT32_FILL	-999.4	
										VDNE_FLOAT32_FILL	-999.3	
SatelliteZenithAngle	4byte(s)	**Name**	**Granule Boundary**		**Dynamic**	**Min Array Size**	**Max Array Size**					
		AlongTrack	Yes		No	768	768					
		CrossTrack	No		No	4064	4064					
		Datum										
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**
		Zenith angle to Satellite at each pixel position	0	0	~70	degree	No		32-bit floating point	**Name**	**Value**	**Name** **Value**
										NA_FLOAT32_FILL	-999.9	
										MISS_FLOAT32_FILL	-999.8	
										ERR_FLOAT32_FILL	-999.5	
										ELINT_FLOAT32_FILL	-999.4	
										VDNE_FLOAT32_FILL	-999.3	
SatelliteAzimuthAngle	4byte(s)	**Name**	**Granule Boundary**		**Dynamic**	**Min Array Size**	**Max Array Size**					
		AlongTrack	Yes		No	768	768					
		CrossTrack	No		No	4064	4064					
		Datum										
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**
		Azimuth angle	0	-180	180	degree	No		32-bit	**Name**	**Value**	**Name** **Value**

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		(measured clockwise positive from North) to Satellite at each pixel position							floating point	NA_FLOAT32_FILL MISS_FLOAT32_FILL ERR_FLOAT32_FILL ELINT_FLOAT32_FILL VDNE_FLOAT32_FILL	-999.9 -999.8 -999.5 -999.4 -999.3	

LunarZenithAngle — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	768	768
CrossTrack	No	No	4064	4064

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Zenith angle of moon at each pixel position	0	0	180	degree	No		32-bit floating point	NA_FLOAT32_FILL MISS_FLOAT32_FILL ERR_FLOAT32_FILL ELINT_FLOAT32_FILL VDNE_FLOAT32_FILL	-999.9 -999.8 -999.5 -999.4 -999.3		

LunarAzimuthAngle — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	768	768
CrossTrack	No	No	4064	4064

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Azimuth angle of moon (measured clockwise positive from North) at each pixel position	0	-180	180	degree	No		32-bit floating point	NA_FLOAT32_FILL MISS_FLOAT32_FILL ERR_FLOAT32_FILL ELINT_FLOAT32_FILL VDNE_FLOAT32_FILL	-999.9 -999.8 -999.5 -999.4 -999.3		

Height — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
AlongTrack	Yes	No	768	768

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		CrossTrack	No		No	4064	4064								
		Datum													
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**			
		Ellipsoid-Geoid separation	0			meter	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**		
										NA_FLOAT32_FILL	-999.9				
										MISS_FLOAT32_FILL	-999.8				
										ERR_FLOAT32_FILL	-999.5				
										ELINT_FLOAT32_FILL	-999.4				
										VDNE_FLOAT32_FILL	-999.3				
SatelliteRange	4byte(s)	**Name**	**Granule Boundary**		**Dynamic**	**Min Array Size**	**Max Array Size**								
		AlongTrack	Yes		No	768	768								
		CrossTrack	No		No	4064	4064								
		Datum													
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**			
		Line of sight distance from the ellipsoid intersection to the satellite	0			meter	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**		
										NA_FLOAT32_FILL	-999.9				
										MISS_FLOAT32_FILL	-999.8				
										ERR_FLOAT32_FILL	-999.5				
										ELINT_FLOAT32_FILL	-999.4				
										VDNE_FLOAT32_FILL	-999.3				
SCPosition	4byte(s)	**Name**	**Granule Boundary**		**Dynamic**	**Min Array Size**	**Max Array Size**								
		Scan	Yes		No	48	48								
		ECRCoordinate	No		No	3	3								
		Datum													
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**			
		Spacecraft position in ECR	0			meter	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**		
										NA_FLOAT32_FILL	-999.9				

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		Coordinates (X, Y, Z) at the mid-time of scan								MISS_FLOAT32_FILL	-999.8		
										ERR_FLOAT32_FILL	-999.5		
										VDNE_FLOAT32_FILL	-999.3		

SCVelocity — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	48	48
ECRCoordinate	No	No	3	3

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Spacecraft velocity in ECR Coordinates (dx/dt, dy/dt, dz/dt) at the mid-time of scan	0			m/s	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

SCAttitude — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	48	48
GRFCoordinate	No	No	3	3

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Spacecraft attitude with respect to Geodetic Reference Frame Coordinates (roll, pitch, yaw)	0			arcsecond	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

SCSolarZenithAngle — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	48	48

Datum

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		Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
		The angle from the normal vector of the Solar Diffuser surface (z-axis of the solar diffuser frame) to the solar vector	0	0	180	degree	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
										NA_FLOAT32_FILL	-999.9		
										MISS_FLOAT32_FILL	-999.8		
										ERR_FLOAT32_FILL	-999.5		
										VDNE_FLOAT32_FILL	-999.3		

SCSolarAzimuthAngle — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	48	48

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
The angle from the Solar Diffuser reference frame x-axis to the projection of the solar vector onto the solar diffuser surface (x-y plane), measured counterclockwise (observer looking toward the SD surface)	0	-180	180	degree	No		32-bit floating point	**Name**	**Value**	**Name**	**Value**
								NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

MoonPhaseAngle — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	1	1

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
Angle between ray	0	0	180	degree	No		32-bit floating	**Name**	**Value**	**Name**	**Value**

		vector to moon from earth and ray vector of satellite to earth							point	NA_FLOAT32_FILL	-999.9		
										MISS_FLOAT32_FILL	-999.8		
										ERR_FLOAT32_FILL	-999.5		
										ELINT_FLOAT32_FILL	-999.4		
										VDNE_FLOAT32_FILL	-999.3		

MoonIllumFraction — 4byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	1	1

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Fraction of the moon illuminated (expressed as percent)	0	0	100	percent	No		32-bit floating point	NA_FLOAT32_FILL	-999.9		
								MISS_FLOAT32_FILL	-999.8		
								ERR_FLOAT32_FILL	-999.5		
								VDNE_FLOAT32_FILL	-999.3		

ModeScan — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	48	48

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
The VIIRS operational mode, reported at the scan level	0			unitless	No		unsigned 8-bit char	MISS_UINT8_FILL	254	Night	0
								ERR_UINT8_FILL	251	Day	1
								VDNE_UINT8_FILL	249		

ModeGran — 1byte(s)

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Granule	Yes	No	1	1

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values	Legend Entries

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		The VIIRS operational mode, reported at the granule level	0			unitless	No		unsigned 8-bit char	**Name**	**Value**	**Name**	**Value**
										MISS_UINT8_FILL	254	Night	0
										ERR_UINT8_FILL	251	Day	1
										VDNE_UINT8_FILL	249	Mixed	2

PadByte1	1byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**							
		Granule	Yes	No	3	3							
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Pad byte	0			unitless	No		unsigned 8-bit char	**Name**	**Value**	**Name**	**Value**

NumberOfScans	4byte(s)	**Name**	**Granule Boundary**	**Dynamic**	**Min Array Size**	**Max Array Size**							
		Granule	Yes	No	1	1							
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**		**Legend Entries**	
		Actual number of VIIRS scans that were used to create this granule	0			unitless	No		32-bit integer	**Name**	**Value**	**Name**	**Value**

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Table 2.18.6-2, VIIRS DNB Geolocation Product Profile - Quality Flags

Name	Data Size	Dimensions
QF1_SCAN_VIIRSSDRGEO	1byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	48	48

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Attitude and Ephemeris availability status	0			unitless	No		2 bit(s)			Nominal - E&A data available	0
										Missing Data <= Small Gap	1
										Small Gap < Missing Data < Granule Boundary	2
										Missing Data >= Granule Boundary	3
HAM/RTA Encoder Flag - Indicates the quality of the HAM and RTA encoder timestamps	2			unitless	No		2 bit(s)			Good Data	0
										Bad Data – either HAM, RTA, or both are bad for the entire scan	1
										Degraded Data – either HAM, RTA, or both are corrupted within the scan.	2
										Missing Data – Missing encoder data for the scan	3

		Within South Atlantic Anomaly	4			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1		
		Solar Eclipse during Earth view scan	5			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1		
		Lunar Eclipse during Earth view scan	6			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1		
		Spare	7			unitless	No		1 bit(s)	Name Value	Name Value		
QF2_VIIRSSDRGEO	1byte(s)	**Name** / **Granule Boundary** / **Dynamic** / **Min Array Size** / **Max Array Size** AlongTrack / Yes / No / 768 / 768 CrossTrack / No / No / 4064 / 4064											
		Datum											
		Description	**Datum Offset**	**Unscaled Valid Range Min**	**Unscaled Valid Range Max**	**Measurement Units**	**Scaled**	**Scale Factor Name**	**Data Type**	**Fill Values**	**Legend Entries**		
		Invalid Input Data (Indicates that any of the Spacecraft Ephemeris or Attitude Data is Invalid or the encoder data is invalid)	0			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1		
		Bad Pointing (Indicates that the sensor LOS does not intersect the geoid, is near the limb, has invalid sensor angles or other similar condition)	1			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1		
		Bad Terrain (Indicates that the algorithm could not obtain a valid terrain value)	2			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1		
		Invalid Solar Angles	3			unitless	No		1 bit(s)	Name Value	Name Value False 0 True 1		
		Spare	4			unitless	No		4 bit(s)	Name Value	Name Value		

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2.18.7 VIIRS DNB SDR Geolocation HDF5 Details

VIIRS-DNB-GEO
+StartTime : H5T_NATIVE_LLONG +MidTime : H5T_NATIVE_LLONG +Latitude : H5T_NATIVE_FLOAT +Longitude : H5T_NATIVE_FLOAT +SolarZenithAngle : H5T_NATIVE_FLOAT +SolarAzimuthAngle : H5T_NATIVE_FLOAT +SatelliteZenithAngle : H5T_NATIVE_FLOAT +SatelliteAzimuthAngle : H5T_NATIVE_FLOAT +LunarZenithAngle : H5T_NATIVE_FLOAT +LunarAzimuthAngle : H5T_NATIVE_FLOAT +Height : H5T_NATIVE_FLOAT +SatelliteRange : H5T_NATIVE_FLOAT +SCPosition : H5T_NATIVE_FLOAT +SCVelocity : H5T_NATIVE_FLOAT +SCAttitude : H5T_NATIVE_FLOAT +SCSolarZenithAngle : H5T_NATIVE_FLOAT +SCSolarAzimuthAngle : H5T_NATIVE_FLOAT +MoonPhaseAngle : H5T_NATIVE_FLOAT +MoonIllumFraction : H5T_NATIVE_FLOAT +ModeScan : H5T_NATIVE_UCHAR +ModeGran : H5T_NATIVE_UCHAR +PadByte1 : H5T_NATIVE_UCHAR +NumberOfScans : H5T_NATIVE_INT +QF1_SCAN_VIIRSSDRGEO : H5T_NATIVE_UCHAR +QF2_VIIRSSDRGEO : H5T_NATIVE_UCHAR

Figure 2.18.7-1, VIIRS DNB SDR Geolocation UML Diagram

2.18.8 VIIRS DNB SDR Geolocation Metadata Details

The HDF5 metadata elements associated with the DNB SDR Geolocation are listed in the CDFCB-X Volume V, Section 4.3, HDF5 (Metadata) Hierarchy. The DNB SDR geolocation metadata includes all common metadata at the root, product, aggregation, and granule level.

In addition to the common metadata items for the VIIRS DNB SDR Geolocation, the items listed in Table 2.18.8-1, VIIRS DNB SDR Geolocation Quality Summary Metadata are included as name/value pair items under the granule level metadata attribute “N_Quality_Summary”. The listed name/value pair items in the table are the granule level quality summary flags for the VIIRS DNB SDR Geolocation.

Table 2.18.8-1, VIIRS DNB SDR Geolocation Quality Summary Metadata

N_Quality_Summary			
Name	**Value**	**Description**	**Comments**
Percent Missing Data	0 – 100 %	Percentage of missing pixels (e.g., insufficient data for geolocation).	

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N_Quality_Summary			
Name	**Value**	**Description**	**Comments**
Percent Out of Bounds	0 – 100 %	Percentage of out of bounds pixels. For example, pixels could not be geolocated.	
Automatic Quality Flag	0 – 1	Indicates if processing error has occurred.	0 = Passed 1 = Failed

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3.0 TDRS – TEMPERATURE DATA RECORDS

Temperature Data Records are geolocated, antenna temperatures.

3.1 ATMS Temperature Data Record

Data Mnemonic	TDRE-ATMS-C0030
Description/ Purpose	Advanced Technology Microwave Sounder (ATMS) uncorrected antenna temperatures. ATMS rotates counter-clockwise (w.r.t. the positive velocity direction) producing 104 views, with each view taking approximately 18 msecs. 96 earth view antenna temperatures are reported in the TDR for each of the 22 channels. ATMS rotates three times every 8 seconds resulting in three scans for every single scan of CrIS.
File-Naming Construct	See the CDFCB-X Volume I, D34862-01, Section 3.0 for details.
File Size	Approximately 59 KiB per data granule. See Section 2.4 ATMS SDR for Geolocation data granule sizing. Sizes do not include HDF5 overhead or metadata.
File Format Type	HDF5
Data Content and Data Format	See Section 3.1.1, ATMS TDR Product Data Content Summary See Section 3.1.5, ATMS TDR Geolocation Data Content Summary

3.1.1 ATMS TDR Product Data Content Summary

Table 3.1.1-1, ATMS TDR Product Data Content Summary

Name	Description	Data Type	Aggregate Dimension (N = Number of Granules)	Granule Dimension	Units
BeamTime	The time in IET at the end of the view period for this observation.	64-bit integer	[N*12, 96]	[12, 96]	microseconds
AntennaTemperature	Antenna temperature for each ATMS channel and beam position.	unsigned 16-bit integer	[N*12, 96, 22]	[12, 96, 22]	kelvin

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Name	Description	Data Type	Aggregate Dimension (N = Number of Granules)	Granule Dimension	Units
InstrumentMode	Instrument mode word 73 in the Health & Status APID 531	unsigned 16-bit integer	[N*4]	[4]	unitless
QF1_GRAN_HEALTHSTATUS	Out of range quality flag for 8 second health and status packet	unsigned 8-bit char	[N*4]	[4]	unitless
QF2_GRAN_HEALTHSTATUS	Out of range quality flag for 8 second health and status packet	unsigned 8-bit char	[N*4]	[4]	unitless
QF3_GRAN_HEALTHSTATUS	Out of range quality flag for 8 second health and status packet	unsigned 8-bit char	[N*4]	[4]	unitless
QF4_GRAN_HEALTHSTATUS	Out of range quality flag for 8 second health and status packet	unsigned 8-bit char	[N*4]	[4]	unitless
QF5_GRAN_HEALTHSTATUS	Out of range quality flag for 8 second health and status packet	unsigned 8-bit char	[N*4]	[4]	unitless
QF6_GRAN_HEALTHSTATUS	Out of range quality flag for 8 second health and status packet	unsigned 8-bit char	[N*4]	[4]	unitless
QF7_GRAN_HEALTHSTATUS	Out of range quality flag for 8 second health and status packet	unsigned 8-bit char	[N*4]	[4]	unitless
QF8_GRAN_HEALTHSTATUS	Out of range quality flag for 8 second health and status packet	unsigned 8-bit char	[N*4]	[4]	unitless
QF9_GRAN_HEALTHSTATUS	Out of range quality flag for 8 second health and status packet	unsigned 8-bit char	[N*4]	[4]	unitless
QF10_GRAN_HEALTHSTATUS	Out of range quality flag for 8 second health and status packet	unsigned 8-bit char	[N*4]	[4]	unitless

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Name	Description	Data Type	Aggregate Dimension (N = Number of Granules)	Granule Dimension	Units
QF11_GRAN_QUADRATICCORRECTION	Quadratic correction applied to the radiometric transfer function for non-linearity correction.	unsigned 8-bit char	[N]	[1]	unitless
QF12_SCAN_KAVPRTCONVERR	If a divide-by-zero condition exists, or if computation loop fails to converge in the temperature computations for the 8 KAV PRTs, the condition is flagged by the corresponding bit in the flag to indicate which PRT has failed.	unsigned 8-bit char	[N*12]	[12]	unitless
QF13_SCAN_WGPRTCONVERR	If a divide-by-zero condition exists, or if computation loop fails to converge in the temperature computations for the 7 WG PRTs, the condition is flagged by the corresponding bit in the flag to indicate which PRT has failed.	unsigned 8-bit char	[N*12]	[12]	unitless
QF14_SCAN_SHELFPRTCONVERR	If a divide-by-zero condition exists, or if the computation loop fails to converge in the temperature computations for the 4 Receiver Shelf (KKa, V, W and G) PRTs, the condition is flagged by the corresponding bit in the flag to indicate which PRT has failed.	unsigned 8-bit char	[N*12]	[12]	unitless
QF15_SCAN_KAVPRTTEMPLIMIT	Each of the 8 KAV PRT temperatures is checked against a lower limit and an upper limit. Out of range conditions are flagged by the corresponding bit in the flag to indicate which PRT has failed the test.	unsigned 8-bit char	[N*12]	[12]	unitless

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Name	Description	Data Type	Aggregate Dimension (N = Number of Granules)	Granule Dimension	Units
QF16_SCAN_WGPRTTEMPLIMIT	Each of the 7 WG PRT temperatures is checked against a lower limit and an upper limit. Out of range conditions are flagged by the corresponding bit in the flag to indicate which PRT has failed the test.	unsigned 8-bit char	[N*12]	[12]	unitless
QF17_SCAN_KAVPRTTEMPCONSISTENCY	The 8 KAV PRT temperatures are checked against each other for consistency. The check failures are flagged by the corresponding bit in the flag to indicate which PRT has failed the test.	unsigned 8-bit char	[N*12]	[12]	unitless
QF18_SCAN_WGPRTTEMPCONSISTENCY	The 7 WG PRT temperatures are checked against each other for consistency. The check failures are flagged by the corresponding bit in the flag to indicate which PRT has failed the test.	unsigned 8-bit char	[N*12]	[12]	unitless
QF19_SCAN_ATMSSDR	Scan-level Quality Flag	unsigned 8-bit char	[N*12]	[12]	unitless
QF20_ATMSSDR	Scan-level Quality Flag per channel	unsigned 8-bit char	[N*12, 22]	[12, 22]	unitless
QF21_ATMSSDR	Out of range - Space and Blackbody View Quality Flag	unsigned 8-bit char	[N*12, 22]	[12, 22]	unitless
QF22_ATMSSDR	Space and Blackbody View Quality Flag	unsigned 8-bit char	[N*12, 22]	[12, 22]	unitless
PadByte1	Pad byte	unsigned 8-bit char	[N*7]	[7]	unitless

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Name	Description	Data Type	Aggregate Dimension (N = Number of Granules)	Granule Dimension	Units
AntennaTemperatureFactors	Scale = first array element; offset = second array element	32-bit floating point	[N*2]	[2]	Scale = unitless; Offset = kelvin

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3.1.2 ATMS TDR Product Profile

Table 3.1.2-1, ATMS TDR Product Profile

Name	Data Size	Dimensions
BeamTime	8byte(s)	
AntennaTemperature	2byte(s)	

BeamTime — Dimensions

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	12	12
BeamPosition	No	No	96	96

BeamTime — Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
The time in IET at the end of the view period for this observation.	0			microsecond	No		64-bit integer	NA_INT64_FILL	-999		
								MISS_INT64_FILL	-998		
								ERR_INT64_FILL	-995		
								VDNE_INT64_FILL	-993		

AntennaTemperature — Dimensions

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Scan	Yes	No	12	12
BeamPosition	No	No	96	96
Channel	No	No	22	22

AntennaTemperature — Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Antenna temperature for each ATMS channel and beam position.	0			kelvin	Yes	Antenna Temperature Factors	unsigned 16-bit integer	NA_UINT16_FILL	65535		
								MISS_UINT16_FILL	65534		
								ERR_UINT16_FILL	65531		
								VDNE_UINT16_FILL	65529		

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Table 3.1.2-2, ATMS TDR Product Profile - Quality Flags

See Section 2.4.2, ATMS SDR Quality Flags.

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Table 3.1.2-3, ATMS TDR Product Profile - Factors

Name	Data Size	Dimensions
AntennaTemperatureFactors	4byte(s)	

Name	Granule Boundary	Dynamic	Min Array Size	Max Array Size
Factors	Yes	No	2	2

Datum

Description	Datum Offset	Unscaled Valid Range Min	Unscaled Valid Range Max	Measurement Units	Scaled	Scale Factor Name	Data Type	Fill Values		Legend Entries	
								Name	Value	Name	Value
Scale = first array element; offset = second array element	0			Scale = unitless; Offset = kelvin	No		32-bit floating point				

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3.1.3 ATMS TDR HDF5 Details

Figure 3.1.3-1 provides the details on the content and data types of the ATMS TDR. This UML diagram provides details at the product level only. In addition to this UML diagram, refer to Figure 2.2-1, Generalized UML Diagram for HDF5 SDR/TDR Files, for a complete UML rendering of this product.

ATMS-TDR
+BeamTime : H5T_NATIVE_LLONG +AntennaTemperature : H5T_NATIVE_USHORT +InstrumentMode : H5T_NATIVE_USHORT +QF1_GRAN_HEALTHSTATUS : H5T_NATIVE_UCHAR +QF2_GRAN_HEALTHSTATUS : H5T_NATIVE_UCHAR +QF3_GRAN_HEALTHSTATUS : H5T_NATIVE_UCHAR +QF4_GRAN_HEALTHSTATUS : H5T_NATIVE_UCHAR +QF5_GRAN_HEALTHSTATUS : H5T_NATIVE_UCHAR +QF6_GRAN_HEALTHSTATUS : H5T_NATIVE_UCHAR +QF7_GRAN_HEALTHSTATUS : H5T_NATIVE_UCHAR +QF8_GRAN_HEALTHSTATUS : H5T_NATIVE_UCHAR +QF9_GRAN_HEALTHSTATUS : H5T_NATIVE_UCHAR +QF10_GRAN_HEALTHSTATUS : H5T_NATIVE_UCHAR +QF11_GRAN_QUADRATICCORRECTION : H5T_NATIVE_UCHAR +QF12_SCAN_KAVPRTCONVERR : H5T_NATIVE_UCHAR +QF13_SCAN_WGPRTCONVERR : H5T_NATIVE_UCHAR +QF14_SCAN_SHELFPRTCONVERR : H5T_NATIVE_UCHAR +QF15_SCAN_KAVPRTTEMPLIMIT : H5T_NATIVE_UCHAR +QF16_SCAN_WGPRTTEMPLIMIT : H5T_NATIVE_UCHAR +QF17_SCAN_KAVPRTTEMPCONSISTENCY : H5T_NATIVE_UCHAR +QF18_SCAN_WGPRTTEMPCONSISTENCY : H5T_NATIVE_UCHAR +QF19_SCAN_ATMSSDR : H5T_NATIVE_UCHAR +QF20_ATMSSDR : H5T_NATIVE_UCHAR +QF21_ATMSSDR : H5T_NATIVE_UCHAR +QF22_ATMSSDR : H5T_NATIVE_UCHAR +PadByte1 : H5T_NATIVE_UCHAR +AntennaTemperatureFactors : H5T_NATIVE_FLOAT

Figure 3.1.3-1, ATMS TDR UML Diagram

3.1.4 ATMS TDR Metadata Details

The HDF5 metadata elements associated with the ATMS TDR are listed in the CDFCB-X Volume V, Section 4.3, HDF5 (Metadata) Hierarchy. The ATMS TDR metadata includes all common metadata at the root, product, aggregation, and granule level.

In addition to the common metadata items for the ATMS TDR, the items listed in Table 3.1.4-1, ATMS TDR Quality Summary Metadata are included as name/value pair items

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under the granule level metadata attribute “N_Quality_Summary”. The listed name/value pair items in the table are the granule level quality summary flags for the ATMS TDRs.

Table 3.1.4-1, ATMS SDR Quality Summary Metadata Values

N_Quality_Summary			
Name	**Value**	**Description**	**Comments**
Summary ATMS TDR Quality	0 – 100 %	Percentage of good quality earth view observations in granule	

3.1.5 ATMS TDR Geolocation Content Summary

See Section 2.4.5 ATMS SDR Geolocation Content Summary.

3.1.6 ATMS TDR Geolocation Product Profile

See Section 2.4.6 ATMS SDR Geolocation Product Profile.

3.1.7 ATMS TDR Geolocation HDF5 Details

See Section 2.4.7 ATMS SDR Geolocation HDF5 Details.

3.1.8 ATMS TDR Geolocation Metadata Details

There are no quality summary metadata items in the ATMS TDR Geolocation.

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3.2 DELETED

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APPENDIX A: DATA MNEMONIC TO INTERFACE MAPPING

See D34862-01, CDFCB-X Volume I, Appendix A for the Data Mnemonic to Interface Mapping for SDRs and TDRs.

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