security class	model	psp	work package n°	DIL n°	CI n°
	All	P.OMIE	47101	07-04-b CAL-10	7200

title

Ozone Monitoring Instrument for EOS-AURA

GDPS Input/Output Data Specification (IODS) Volume 4

Operational Parameters File

summary

The GDPS Input/Output Data Specification (IODS) defines the input, intermediate, log- and output data associated with the GDPS. The IODS consists of the following volumes:
Volume 1: Overview, Input, Intermediate and Auxillary Output files
Volume 2: Level 1B Output products and Metadata
Volume 3: Production Rules
Volume 4: Operational Parameters File

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Change Record

issue	date	total pages	released	pages affected	brief description of change
1	Nov 2004	78	T. Watts	All	SD-OMIE-7200-DS-275 Issue 2 was split up into three volumes (SD-OMIE-7200-DS-466, SD-OMIE-7200-DS-467and SD-OMIE-7200-DS-468). This document, volume 4, describing the contents of the OPF, was added later as a replacement for RP-OMIE-7300-DS-391. This document supersedes issue 4 of RP-OMIE-7300-DS-391.
2	February 2005	80	T. Watts	section 3.2, 4.2 section 4.3 through 4.21 section 4.5 section 4.5.2, 4.5.3, 4.5.4, 4.5.5 Section 4.5.22, 4.5.39, 4.10.4, 4.10.9	Added support for UINT data types and remarks on how these are handled in the GDPS. Changed data types to UINT for all entries that are GDPS internally used as unsigned integer. Removed Dead Pixel List and RTS Pixel List Added Bad and Dead Pixel map and related masks - Added Expected Small Pixel Column and Inhomogeneous slit illumination correction coeffiecient - Implementation of FAR RID KNMI-30, KNMI-42
3	13 March 2006	83	T. Watts	Section 4.5, 4.6, 4.9 Sec. 4.10.15 Section 4.9	Added/removed entries for: - DEM Saturation Flagging - Transient Pixel Flagging Changed DOAS fit value = 1 and Direct fit value = 0 Renamed some of the variables that appear in tables for transient pixel flagging CAL & RAD

4	28 March 2006	83	T. Watts	Sections 4.3, 4.7, 4.8 Sections 4.3, 4.8, 4.9	Added/removed entries for revision/split off of calculation of delta irradiance coefficients from irradiance sensitivity correction Parameters that were removed from issues 3, 4 and onwards, are placed back as obsolete
5	Augustus 2006	92	T. Watts	Sections 4.3, 4.8 Section 3.3	Added entries for measurement and spectral straylight correction Extended convention on polynomial coefficients. Added convention on reference order
6	October 2007	90	T. Watts	Sec 4.7, 4.8, 4.9, 4.10 Sec. 4.5.54 Sec. 4.4.9 Sections. 4.3.22-4.3.24 4.3.28-4.3.30	Changed to UV2 in stead of UV1. Added entries for UV VIS SPC conversion Added entry for pixel to pixel noise Added entries for high and low azimuth limits
7	November 2009	90	T. Watts	Section 4.9.13	Added entry for XTrack Quality Flagging Parameters.

List of TBx's

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1. Introduction

1.1 Purpose and Scope

The purpose of the GDPS Input/Output Data Specification (IODS) is to specify:
- all input files that are required for the on-ground processing of the OMI L0 data to L1B data
- all Level 1B (L1B) Data Products, their formats and the corresponding metadata that are generated by the GDPS
- all other output files and intermediate files that are generated
- the production rules that are required for nominal, automated processing of Level 0 PDS, EDS and RBDS data

The input files, intermediate files and output Data Products are described in terms of their:
- Short name and Long name
- Filename convention
- Description (e.g. purpose)
- Format (i.e. HDF-EOS, ASCII)
- Source (e.g. KNMI, DAAC, EDOS, OSIPS) (if applicable)
- Destination (e.g. KNMI, DAAC, OSIPS) (if applicable)
- Granule
- (Estimated) size
- Contents

For Format and Contents, references to documents that contain detailed information are provided where possible or applicable. For the Level 1B products and the Operational Parameters File (OPF) detailed descriptions of the format and contents are provided in Volume 2 and Volume 4 of the IODS respectively.

The IODS consists of the following volumes:
- Volume 1: Overview, Input, Intermediate and Auxiliary Output files; This volume describes all the input files, the intermediate files (e.g. files that are shared between the executables that make up a PGE), and all output files, except for the OPF and Level 1B output files. The Level 1B output files are described in:
- Volume 2: Level 1B Output products and Metadata; This volume describes in detail the format and contents of the Level 1B Output products that are generated by the GDPS.
- Volume 3: Production Rules; The Production rules specify for the various operational scenarios which files are required as input, which files will be produced as intermediate as well as output files, which runtime parameters should be supplied and which executable should be run (and how).
- Volume 4: Operational Parameters File Specification; This volume describes in detail the format and contents of the Operational Parameters File, which contains settings, conversion and correction parameters for the algorithms in the GDPS.

Note that the IODS only covers the normal operational scenarios of the OMI L0 to L1B data processing software. Scenarios for development and testing purposes are not covered by this document.

A list of general abbreviations, acronyms, and definitions is included in Volume 1 only. Each Volume provides additional information on purpose and scope as required.

Purpose of this volume of the IODS is to provide a clear view of the Operational Parameters file (OPF) format. The intended readers are the OMI scientists that have to maintain the OPF.

The Operational Parameter File (OPF) is required to run the GDPS. It contains the calibration data that are required for the correction of the raw digital video data and settings required for processing. The OPF contains a collection of parameters / datasets that can be used to establish a change in calculation, correction and flagging behaviour.

1.2 Applicability Statement

This document applies to the Launch Version 1-1-0 of the OMI Level 0-1B data processing software.

1.3 Document Structure

Chapter 1 covers the purpose and scope of the GDPS Input/Output Data Specification (IODS) Volume 4 , and the document structure.

Chapter 2 provides a list of the applicable and reference documents.

Chapter 3 gives an introduction to the Operational Parameter File (OPF) and provides generic detailed information, such as format and conventions used for the OPF.

Chapter 4 presents the individual OPF Parameters in detail.

Chapter 5 describes the metadata of the OPF.

2. Document List

2.1 Applicable Documents

	Document number	Issue	Date	Document title
[AD_01]	RP-OMIE-0000-DS-146	6	February 2005	Algorithm Theoretical Basis Document for Level 0-1B processing
[AD_02]	RS-OMIE-7000-FS-186	4	April, 2002	User Requirements Document for the Level 0-1B Data processor
[AD_03]	PL-OMIE-7000-DS-187	3	Nov 2004	Software Management Plan for the OMI Level 0 to 1B Dataprocessor
[AD_04]	SD-OMIE-7100-DS-251	10	Aug 2006	GDPS Detailed Processing Model and Parameter Data List (DPM/PDL)
[AD_05]	TRW D26478	B	13-08-2002	Interface Control Document for the Ozone Monitoring Instrument system
[AD_06]	423-41-64	Draft	December , 2000	Interface Requirements Document between EOS Instrument Team Science Data Processing Software and the ECS/DAAC
[AD_07]	Litton 990639	Revi sion B	Dec 19, 2000	OMI IAM ICD
[AD_08]	SD-OMIE-7200-DS-466	3	Aug 2006	GDPS Input/Output Data Specification (IODS) Volume 1
[AD_09]	SD-OMIE-7200-DS-467	5	Aug 2006	GDPS Input/Output Data Specification (IODS) Volume 2
[AD_10]	SD-OMIE-7200-DS-468	3	Aug 2006	GDPS Input/Output Data Specification (IODS) Volume 3

2.2 Reference Documents

	Document number	Issue	Date	Document title
[RD_01]	GSFC 422-11-12-01	B	August 1998	General Interface Requirements Document (GIRD) For EOS Common Spacecraft / Instruments
[RD_02]	423-ICD-EDOS/EGS	3	April 28, 2001	Interface Control Document between the Earth Observing System (EOS) Data and Operations System (EDOS) and the EOS Ground System (EGS) elements CDBRL B301
[RD_03]	RP-OMIE-0000-DS-119	7	April 15, 2003	Command and Telemetry Handbook
[RD_04]	OBSOLETE	-	-	-

	Document number	Issue	Date	Document title
[RD_05]	333-CD-600-001	6A	November 2000	Release 6A SDP Toolkit Users Guide for the ECS Project
[RD_06]	RP-OMIE-0000-FS-040	1	Aug 1998	OMI Glossary of terms and abbreviations
[RD_07]	http://nsidc.org/data/docs/daac/nise1_nise.gd.html	March 2004	March 2004	Near Real- Time SSM/ I EASE- Grid Daily Global Ice Concentration and Snow Extent
[RD_08]	IC-OMIE-0000-DS-423	1	December 2004	Interface Definition between Operations and Level 1B Software.
[RD_09]	SE-OMIE-0614-DS/02	2	14 August, 2002	Implementation of ELU Register 0x02 and 0x03 in the OMI GDPS
[RD_10]	RP-OMIE-KNMI-365	1	1 August 2002	OMI GDPS: Use of flags
[RD_11]	LE-OMIE-KNMI-367	1	31 July 2002	Input for production rules GDPS
[RD_12]	TN-OMIE-KNMI-397	1	25 November 2002	OMI Small Pixel Data
[RD_13]	RP-OMIE-KNMI-396	1	22 November 2002	Interpretation flags in OMI Level 1B data products
[RD_14]	OMI-SSDG-0.9.9	0.9.9	October 21, 2003	OMI Science Software Delivery Guide for Version 0.9
[RD_15]	OMI-ODPS-OMIDAPS-ICD-0.9.10	0.9.10	March 18, 2004	ODPS-OMIDAPS Interface Control Document
[RD_16]	RP-OMIE-KNMI-434	1	3 March 2003	Refined OMI L0, L1B, L2 Cloud and L2 Ozone column data volume estimates
[RD_17]	SW-NCA-079	1.2	October 3, 2002	HDF-EOS Aura File Format Guidelines
[RD_18]	SE-OMIE-0545-FS/01	2	3 May 2002	Definition of OMIS Resources and Modes
[RD_19]	RP-OMIE-KNMI-336	1	April 26, 2002	OMIS Nominal Operations Baseline
[RD_20]	http://ecsinfo.gsfc.nasa.gov/ECSInfo/ecsmetadata/Training/Training_doc/esdtcomp41.ppt	-	March 2003	Earth Science Data Types (ESDTs) (Training / Presentation)
[RD_21]	http://hdf.ncsa.uiuc.edu/UG41r3_html/	4.1r3	May 1999	HDF User's Guide
[RD_22]	170-TP-100-002	1	January 1999	HDF-EOS Library User's Guide for the ECS Project, Volume 1: Overview and Examples

3. Operational Parameters File Introduction and Overview

3.1 Operational Parameters File Structure

Figure 1 provides an overview of the OPF structure.

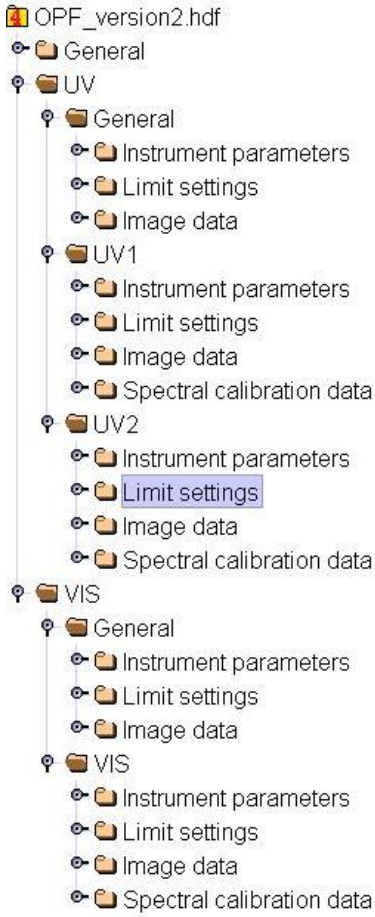

Figure 1: OPF Tree

The OPF is in HDF4 format and presents the parameters / datasets in a tree structured way. The parameter entries form the leaves of this tree. Each parameter entry is stored in a key/value fashion. The parameter tree contains three levels of nodes. The first 2 levels link the OPF data to a specific channel (detector) or sub-channel in the instrument as applicable:

Level 1	Level 2	Description
General	-	Parameters that cannot be linked to a specific channel or sub-channel in the instrument. Examples of such parameters are specifications of solar eclipses and polynomial coefficients for calculating the temperature for the sensors on the Optical Bench. This groups contains no other sub-group. It directly contains datasets.

Level 1	Level 2	Description
UV	General	Parameters that are specific to the UV channel / detector of the instrument. Examples of such parameters are gains for the detector electronics and dark current maps.
UV	UV1	Parameters that are specific to the UV-1 sub-channel of the instrument. Examples of such parameters are radiance conversion functions and spectral calibration coefficients.
UV	UV2	Parameters that are specific to the UV-2 sub-channel of the instrument. Examples of such parameters are radiance conversion functions and spectral calibration coefficients. This section has the same structure (sub-groups and parameter entries) as "UV/UV1".
VIS	General	Parameters that are specific to the VIS channel / detector of the instrument. Examples of such parameters are gains for the detector electronics and dark current maps. This section has the same structure (sub-groups and parameter entries) as "UV/General".
VIS	VIS	Parameters that are specific to the VIS sub-channel of the instrument. Examples of such parameters are radiance conversion functions and spectral calibration coefficients. This section has the same structure (sub-groups and parameter entries) as "UV/UV1".

Table 3.1 Description of Level 1 and 2 in the OPF tree

The third level combines parameters into logical groups. The Level 3 groups are contained in each of the Level 2 groups, but not in the Level 1 "General" group.

Level 3	Description
Instrument parameters	Parameters that provide a description of the Instrument properties to the GDPS. Examples are instrument gains and dead pixel lists.
Limit settings	Parameters that define the allowed deviation of measured values (or values calculated from these measured values), either compared to an OPF value, a (set of) calculated coefficient(s) or in an absolute sense. When a value is outside the specified limits, typically a (warning or error) flag will be raised. Examples are saturation limits and limits for the measured offset values.
Image data	Parameters that are described at the Pixel Level of the instrument. Examples are dark current maps and PRNU maps.
Spectral calibration data	Parameters specifically for the wavelength assignment and spectral calibration algorithms. Since these are linked to the sub-channels of the instrument, this third level group is not present in the "General", "UV/General" and "VIS/General" groups. Examples are the spectral calibration coefficients and the reference column.

Table 3.2 Description of Level 3 in the OPF tree

3.2 HDF Format Details

The OPF is stored in HDF 4 format. The Groups in the tree are created as HDF VGroups. The data itself, the leaf nodes in the tree are stored as HDF SDS datasets. The names that are used for the groups and datasets are interpreted case insensitive.

Ingestion of the OPF by the GDPS is driven by the “GDPS needs”, not the “OPF contents”. That is, the GDPS will search the OPF for all the data that it needs, rather then browsing the OPF and determine how to handle each data item. This means that it is allowed to store additional data elements or attributes in the OPF, which will be silently ignored by the GDPS.

It is required that all datasets that the GDPS uses are present in the OPF with the appropriate type and dimension. The GDPS will checked this upon initialisation and will abort with a fatal errors in case something is not as expected.

For GDPS versions up-to and including version 0.9.8, the GDPS always used HDF signed integer data types for OPF parameters that were internally interpreted as unsigned integers. This was possible since the required data range for these OPF datasets was well within the data range that was provided by the HDF signed integer data types. With the addition of the Bad and Dead Pixel Map (4.5.2 up to 4.5.5) to the OPF this has changed.

From version 0.9.9 upward, the GDPS can read unsigned integer data sets both from HDF signed integer data sets and HDF unsigned integer data sets. The GDPS will automatically detect which data type was used to store the data and will use the appropriate read routines. Note that it was chosen to keep support for the signed integer data types rather than forcing all appropriate data types to be stored in unsigned integer format for backwards compatibility.

3.3 OPF Conventions

3.3.1 Dimension Order

The dimensions specified in this document are given with the slowest iterating dimension first. In case a dataset stores measurement related data, such as correction maps, the columns of the data are stored as the fastest iterating dimension, the rows are slower iterating and, in case multiple maps / images are stored in the dataset, these are stored with the slowest iterating dimension. That is, in case of a dataset with 5 maps at CCD resolution (577 rows by 814 columns), the dimensions for that dataset will be { 5, 577, 814 }.

3.3.2 Polynomial Coefficients Order

The parameters that are representing polynomial coefficients are stored in arrays or matrices. They refer to these polynomial coefficients by using index values 0, 1, 2,…,n respectively for the 0th, 1st, 2nd,…, n^{th} polynomial order. In case of a polynomial in more than one variable the order of coefficients matches the order of (presentation of) variables. If an OPF entry allows for storage of more than one polynomial, i.e. the parameter is a matrix that may contain multiple coefficient arrays, then the polynomial degree(s) is/are always after all other dimensions, and thereby the coefficients run fastest.

3.3.3 CCD Coordinates

Figure 2 shows the layout of the detector CCD. When we refer to the CCD orientation, indexing and coordinates in the OPF parameter list, one should be aware of the following aspects:

- The lower right corner of the CCD, which is the pixel closest to the read-out node of the CCD, is defined as the Origin [0, 0]. All rows and columns are 0 based.
- All image data covering the CCD includes the excess pixels and the read-out Register (row 0). This results in a CCD definition of 577 rows by 814 columns.
- The horizontal axis is defined as the column index i or ii.
- The vertical axis is defined as the row index j or jj.
- A CCD coordinate is defined as [row index, column index].
- A Region on the CCD is defined by [low row index, low column index, high row index, high column index].
- The CCD coordinate unit and resolution is expressed in CCD Pixels.

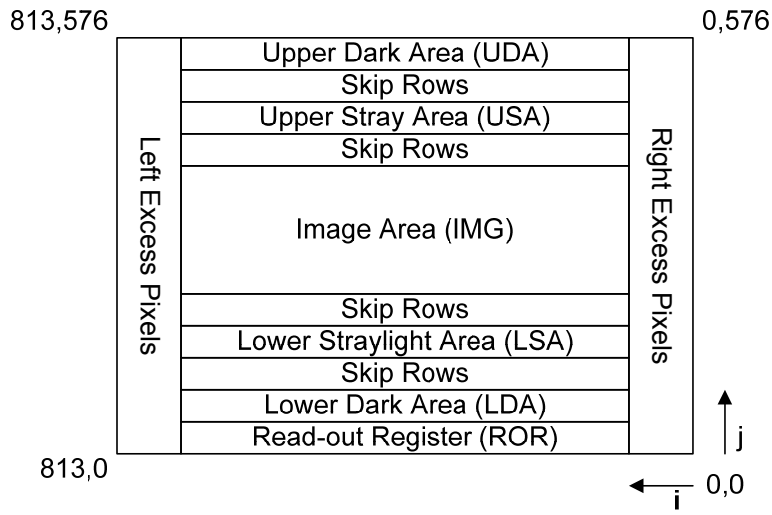

Figure 2: CCD layout

3.3.4 Gain Order

The instrument supports the use of different gain factors within one image. This is depicted in Figure 3. All Dark and Stray light areas share the same gain factor (D/S Gain), which can be selected out of 4 possible gain factors. For the IMG and ROR areas, it is possible to create up to 4 areas with a different gain factor, also selectable from the same 4 possible gain factors. These 4 areas are defined by so called Gain Switch Columns, in the picture abbreviated as GS Col 1, GS Col 2 and GS Col 3. The position of these Gain Switch Columns and the gain factor to use in between the Gain Switch Columns are part of the instrument configuration.

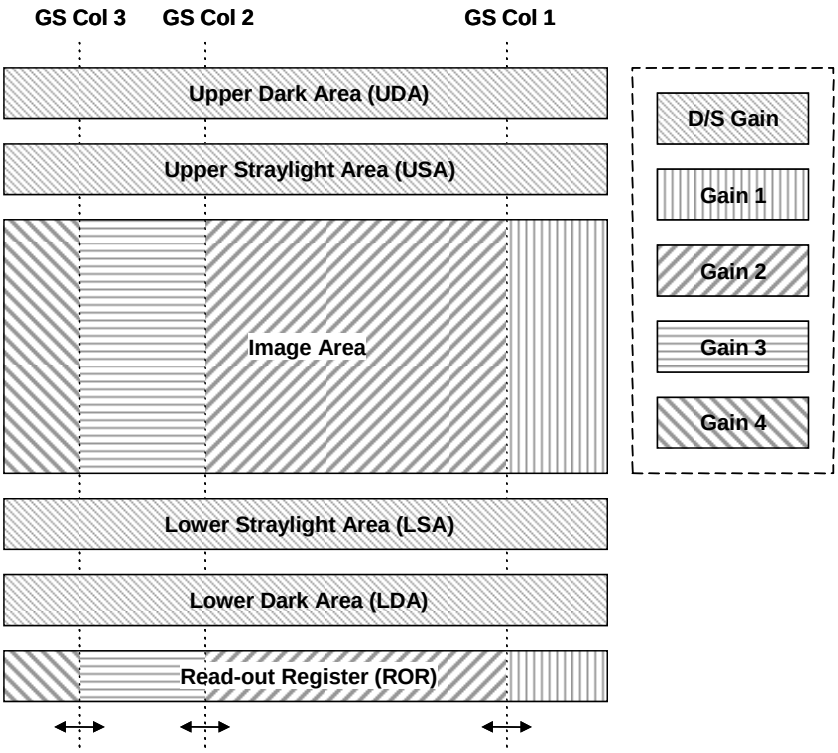

Figure 3: Overview of areas with different gain factor properties

For instrument configuration and in the instrument telemetry gain codes are used instead of the actual gain factor. Each gain code corresponds to a specific gain in the electronics. Table 3.3 gives an overview of the different gain codes and there approximate relative gain.

Gain Code	Relative Gain
0	approx. 10x
1	approx. 40x
2	approx. 1x
3	approx. 4x

Table 3.3 OMI Gain Codes and Relative Gains

OPF parameters that are depending on the gain or gain area are stored in arrays. They refer to these 4 gains codes by using index values 0, 1, 2 and 3 respectively for Gain Code 0, Gain Code 1, Gain Code 2 and Gain Code 3.

3.3.5 Reference Order

OPF parameters that are stored in arrays or matrices (may) vary with a factor that does not fall under one of the above conventions, nor are the values on which the dependence occurs given explicitly as a non-dependent dimension of the OPF parameter itself. In such a case, the OPF parameter contains a dependency through reference, which means the existence of another OPF parameter that couples a dependency to index or look-up values that apply to the OPF parameter that is referenced to. Convention here is that for a parameter referred to by index the values apply to the first dimension and are taken starting from 0, where the value -1 stands for an unreferenced entry. Moreover, in reference by look-up value the search is done by access through the first dimension of the parameter referred to.

4. Details of Operational Parameters

4.1 Introduction

This section specifies in detail the operational parameters. Section 3.3 presents the general applicable conventions used in the parameter specification. Each parameter is described in this section by a number of properties. Section 4.2 describes the meaning of these properties. The remaining sections contain the actual operational parameter specifications.

The names of the sub-sections in this section indicate the name(s) and group(s) with which the data shall be stored in the OPF. Nesting of groups is denoted by the forward slash (/) character. That is, a sub-section named “Group UV/General/Image Data” indicates that all data-sets described in that sub-section shall be stored in an HDF VGroup “Image Data”, which is part of VGroup “General”, which is part of the root VGroup “UV”.

For each of the parameters / datasets that shall be stored in the VGroup there is a separate sub-section containing the parameter / dataset description. The name of that sub-section is equal to the SDS dataset name. The way in which the parameters are described is explained in more detail in section 4.2.

4.2 Parameter description fields

Each parameter is described by a table that includes the following field information:

Description:

Describes the parameters purpose.

Type:

This field specifies the HDF specific data type that is used to model the particular parameter. The following types are used:

DFNT_FLOAT32	(HDF Native 32 bits floating point)
DFNT_INT32	(HDF Native 32 bits signed integer)
DFNT_UINT32	(HDF Native 32 bits unsigned integer)
DFNT_CHAR8	(HDF Native 8 bit character)

N.B. Internally, the GDPS may convert these data types in the OPF to other data types. For example, float32 values are typically converted to float64. As a result of these conversions, [AD_04], may mention (slightly) different data types than specified in this document.
N.B. For data sets that are specified in the document with type DFNT_UINT32, the GDPS also allows these datasets to be stored as DFNT_INT32, provided that the DFNT_INT32 data range is able to support the data range of the given dataset (see also section 3.2).

Cardinality:

The number of entries specified in this field matches the number of data structure dimensions listed in the Type: field. Each specified array dimension contains a value that indicates the number of entries involved. The dimensions are specified with slowest iterating dimension first and fastest iterating dimension last. This is also the order in which they are read and written using the HDF C-API routines (start / edges parameters). A special value UNDEF for a dimension indicates that this particular dimension has a variable size. The GDPS will determine the actual dimension to use from the OPF dataset when it is read at run-time.

Range:

This field specifies the range of values for this particular parameter for which the algorithms are validated. When a defined range is checked by the GDPS, this is explicitly specified. All range checks are carried out at the beginning of the processing run. The GDPS will abort before any processing in case any of the range checks is violated.

Values:

This field shows typical operational parameter values, but can also contain a remark about the formatting of the parameter.

Units:

This field contains the units of the parameter. Most of the time SI units are applied but there are a few exceptions to take into account. The **dimensionless** keyword is specified when a parameter consists of a more complex data structure or when the parameter has no units, e.g. gains and coefficients.

Used in:

This field specifies in which algorithm the parameter is used. If any of the following keywords are specified it means that this parameter is not used by any of the algorithms:

Metadata. This means that the parameter is used to create the metadata of the level 1-B output products.

Preparator. This means that the parameter is used by the GDPS Data Preparator software component, responsible for data ingestion.

GDPS. This means that the parameter is used throughout the GDPS

Variable Name:

This field represents the variable name that is used in the DPM [AD_04] for this parameter.

4.3 Group General

4.3.1 Attitude Offset Threshold

Description:	On-ground Attitude Offset Threshold. This threshold specified the (approximate) maximum distance that the instrument may point off-nadir before the spacecraft manoeuvre flag will be raised.
Type:	DFNT_UINT32
Cardinality:	{ 1 }
Range:	>=0 (checked)
Values:	-
Units:	km
Used in:	Geo-location
Variable Name:	th_{att_offset}

4.3.2 Co-addition Limit

Description:	The number of co-additions above which the possibility exists that a co-addition overflow can occur
Type:	DFNT_UINT32
Cardinality:	{ 1 }
Range:	1 – 64 (checked)
Values:	Typical Value = 16
Units:	dimensionless
Used in:	Co-addition overflow possibility flagging
Variable Name:	co_addition_limit

4.3.3 Delta Irradiance Sensitivity Backup Diffusor

Description:	Delta Irradiance Sensitivity Coefficients for the backup diffuser. Dataset containing polynomial coefficients that model the delta Irradiance dependency for the elevation and azimuth angles and the CCD row set (swath angle).
Type:	DFNT_FLOAT32
Cardinality:	{ UNDEF, UNDEF, UNDEF }
Range:	-
Values:	The dataset contains coefficients for the polynomial T_0. The coefficients for the elevation angle are along the last dimension, for the azimuth angle along the middle dimension. The first dimension denotes the row set for which T_0 applies.
Units:	dimensionless
Used in:	Calculation of Delta irradiance correction coefficients
Variable Name:	$c_{dIRRAD}(j_{map},n_{\beta},n_{\alpha})_{0,s}$

4.3.4 Delta Irradiance Sensitivity Backup wav coefs linear

Description:	Delta Irradiance Sensitivity Coefficients for the backup diffuser. Dataset containing polynomial coefficients that model the delta Irradiance dependency for the elevation and azimuth angles and the CCD row set (swath angle).
Type:	DFNT_FLOAT32
Cardinality:	{ UNDEF, UNDEF, UNDEF }
Range:	-
Values:	The dataset contains coefficients for the polynomial T_1. The coefficients for the elevation angle are along the last dimension, for the azimuth angle along the middle dimension. The first dimension denotes the row set for which T_1 applies.
Units:	dimensionless
Used in:	Calculation of Delta irradiance correction coefficients
Variable Name:	$c_{dIRRAD}(j_{map},n_\beta,n_\alpha)_{1,s}$

4.3.5 Delta Irradiance Sensitivity Backup wav coefs quadratic

Description:	Delta Irradiance Sensitivity Coefficients for the backup diffuser. Dataset containing polynomial coefficients that model the delta Irradiance dependency for the elevation and azimuth angles and the CCD row set (swath angle).
Type:	DFNT_FLOAT32
Cardinality:	{ UNDEF, UNDEF, UNDEF }
Range:	-
Values:	The dataset contains coefficients for the polynomial T_2. The coefficients for the elevation angle are along the last dimension, for the azimuth angle along the middle dimension. The first dimension denotes the row set for which T_2 applies.
Units:	dimensionless
Used in:	Calculation of Irradiance sensitivity correction coefficients
Variable Name:	$c_{dIRRAD}(j_{map},n_\beta,n_\alpha)_{2,s}$

4.3.6 Delta Irradiance Sensitivity Regular Diffusor

Description:	Delta Irradiance Sensitivity Coefficients for the backup diffuser. Dataset containing polynomial coefficients that model the delta Irradiance dependency for the elevation and azimuth angles and the CCD row set (swath angle).
Type:	DFNT_FLOAT32
Cardinality:	{ UNDEF, UNDEF, UNDEF }
Range:	-
Values:	The dataset contains coefficients for the polynomial T_0. The coefficients for the elevation angle are along the last dimension, for the azimuth angle along the middle dimension. The first dimension denotes the row set for which T_0 applies.
Units:	dimensionless
Used in:	Calculation of Delta irradiance correction coefficients
Variable Name:	$c_{dIRRAD}(j_{map},n_\beta,n_\alpha)_{0,s}$

4.3.7 Delta Irradiance Sensitivity Regular wav coefs linear

Description:	Delta Irradiance Sensitivity Coefficients for the backup diffuser. Dataset containing polynomial coefficients that model the delta Irradiance dependency for the elevation and azimuth angles and the CCD row set (swath angle).
Type:	DFNT_FLOAT32
Cardinality:	{ UNDEF, UNDEF, UNDEF }
Range:	-
Values:	The dataset contains coefficients for the polynomial T_1. The coefficients for the elevation angle are along the last dimension, for the azimuth angle along the middle dimension. The first dimension denotes the row set for which T_1 applies.
Units:	dimensionless
Used in:	Calculation of Delta irradiance correction coefficients
Variable Name:	$c_{dIRRAD}(j_{map},n_{\beta},n_{\alpha})_{1,s}$

4.3.8 Delta Irradiance Sensitivity Regular wav coefs quadratic

Description:	Delta Irradiance Sensitivity Coefficients for the backup diffuser. Dataset containing polynomial coefficients that model the delta Irradiance dependency for the elevation and azimuth angles and the CCD row set (swath angle).
Type:	DFNT_FLOAT32
Cardinality:	{ UNDEF, UNDEF, UNDEF }
Range:	-
Values:	The dataset contains coefficients for the polynomial T_2. The coefficients for the elevation angle are along the last dimension, for the azimuth angle along the middle dimension. The first dimension denotes the row set for which T_2 applies.
Units:	dimensionless
Used in:	Calculation of Irradiance sensitivity correction coefficients
Variable Name:	$c_{dIRRAD}(j_{map},n_{\beta},n_{\alpha})_{2,s}$

4.3.9 Delta Irradiance Sensitivity Volume Diffusor

Description:	Delta Irradiance Sensitivity Coefficients for the backup diffuser. Dataset containing polynomial coefficients that model the delta Irradiance dependency for the elevation and azimuth angles and the CCD row set (swath angle).
Type:	DFNT_FLOAT32
Cardinality:	{ UNDEF, UNDEF, UNDEF }
Range:	-
Values:	The dataset contains coefficients for the polynomial T_0. The coefficients for the elevation angle are along the last dimension, for the azimuth angle along the middle dimension. The first dimension denotes the row set for which T_0 applies.
Units:	dimensionless
Used in:	Calculation of Delta irradiance correction coefficients
Variable Name:	$c_{dIRRAD}(j_{map},n_{\beta},n_{\alpha})_{0,s}$

4.3.10 Delta Irradiance Sensitivity Volume wav coefs linear

Description:	Delta Irradiance Sensitivity Coefficients for the backup diffuser. Dataset containing polynomial coefficients that model the delta Irradiance dependency for the elevation and azimuth angles and the CCD row set (swath angle).
Type:	DFNT_FLOAT32
Cardinality:	{ UNDEF, UNDEF, UNDEF }
Range:	-
Values:	The dataset contains coefficients for the polynomial T_1. The coefficients for the elevation angle are along the last dimension, for the azimuth angle along the middle dimension. The first dimension denotes the row set for which T_1 applies.
Units:	dimensionless
Used in:	Calculation of Delta irradiance correction coefficients
Variable Name:	$c_{dIRRAD}(j_{map},n_{\beta},n_{\alpha})_{1,s}$

4.3.11 Delta Irradiance Sensitivity Volume wav coefs quadratic

Description:	Delta Irradiance Sensitivity Coefficients for the backup diffuser. Dataset containing polynomial coefficients that model the delta Irradiance dependency for the elevation and azimuth angles and the CCD row set (swath angle).
Type:	DFNT_FLOAT32
Cardinality:	{ UNDEF, UNDEF, UNDEF }
Range:	-
Values:	The dataset contains coefficients for the polynomial T_2. The coefficients for the elevation angle are along the last dimension, for the azimuth angle along the middle dimension. The first dimension denotes the row set for which T_2 applies.
Units:	dimensionless
Used in:	Calculation of Irradiance sensitivity correction coefficients
Variable Name:	$c_{dIRRAD}(j_{map},n_{\beta},n_{\alpha})_{2,s}$

4.3.12 Eastern Most Bounding Longitude Solar Eclipses

Description:	The GDPS will flag ground pixels that may be affected by a solar eclipse. For this purpose, in the OPF the time intervals are stored for which solar eclipses occur and also a latitude / longitude bounding box for the spatial extents that are affected by the solar eclipse. The number of entries for each of the data-sets (i.e. Start Times Solar Eclipses in section 4.3.59, End Times Solar Eclipses in section 4.3.16, Eastern Most Bounding Longitude Solar Eclipses in section 4.3.12, Western Most Bounding Longitude Solar Eclipses in section 4.3.63, Southern Most Bounding Latitude Solar Eclipses in section 4.3.47 and Northern Most Bounding Latitude Solar Eclipses in section 4.3.36) must be equal, where each index relates to one solar eclipse event. This dataset specifies for each of the solar eclipses the bounding longitude at the east side of the spatial bounding box.
Type:	DFNT_FLOAT32
Cardinality:	{ UNDEF }
Range:	-180 – 180
Values:	-
Units:	degree
Used in:	Geo-location
Variable Name:	SOL_eclips_east(n)

4.3.13 ELU1 Temperature polynomial coefficients

Description:	Temperature conversion polynomial coefficients for conversion of Engineering units (LSB) to physical units (K) for the temperature sensor on the ELU Video Channel 1 PCB.
Type:	DFNT_FLOAT32
Cardinality:	{ UNDEF }
Range:	-
Values:	-
Units:	K / LSB_n
Used in:	Preparator
Variable Name:	ELU1_TEMP_c_n

4.3.14 ELU2 Temperature polynomial coefficients

Description:	Temperature conversion polynomial coefficients for conversion of Engineering units (LSB) to physical units (K) for the temperature sensor on the ELU Video Channel 2 PCB.
Type:	DFNT_FLOAT32
Cardinality:	{ UNDEF }
Range:	-
Values:	-
Units:	K / LSB_n
Used in:	Preparator
Variable Name:	ELU2_TEMP_c_n

4.3.15 ELUAUX Temperature polynomial coefficients

Description:	Temperature conversion polynomial coefficients for conversion of Engineering units (LSB) to physical units (K) for the temperature sensor on the ELU AUX PCB.
Type:	DFNT_FLOAT32
Cardinality:	{ UNDEF }
Range:	-
Values:	-
Units:	K / LSB_n
Used in:	Preparator
Variable Name:	ELUAUX_TEMP_c_n

4.3.16 End Times Solar Eclipses

Description:	End Times Solar Eclipses For description, see section 4.3.12. This dataset specifies for each of the solar eclipses the end time of the solar eclipse.
Type:	DFNT_CHAR8
Cardinality:	{ UNDEF }
Range:	-
Values:	This dataset is stored as a string, containing a comma separated list of UTC date/time stamps in CCSDS ascii timecode A format.
Units:	UTC
Used in:	Geo-location
Variable Name:	SOL_eclips_end(n)

4.3.17 Exposure Smear Use Standard Flag

Description:	Exposure Smear Use Standard Flag Specifies which method should be used for exposure smear correction.
Type:	DFNT_UINT32
Cardinality:	{ 1 }
Range:	0 – 1 (checked)
Values:	1 = STANDARD and 0 = OPTIONAL (use data in dark current row)
Units:	dimensionless
Used in:	Calculation of Exposure smear correction coefficients
Variable Name:	Exp_smear_use_std_flag

4.3.18 Irradiance Average Elevation Minimum

Description:	For each data granule that is processed by the GDPS, the software can create an average of the solar irradiance measurements, reducing the temporal resolution. During a single solar observation, the azimuth angle of the sun pointing vector in the optical alignment reference frame is fairly constant (this angle changes over the seasons), but the elevation angle changes over the observation. For the extreme elevation angles of the solar observation, the sun may not fully illuminate the on-board diffuser, which will affect data quality. Therefore, the averaging can be limited to a specific elevation angle range. This dataset specifies the minimum elevation angle of the sun pointing vector in the optical alignment reference frame, for which Solar Irradiances will be included in the average.
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	-180 – 180 (checked)
Values:	Typical value = -3.0
Units:	degree
Used in:	Irradiance Averaging
Variable Name:	elevation_min

4.3.19 Irradiance Average Elevation Maximum

Description:	For each data granule that is processed by the GDPS, the software can create an average of the solar irradiance measurements, reducing the temporal resolution. During a single solar observation, the azimuth angle of the sun pointing vector in the optical alignment reference frame is fairly constant (this angle changes over the seasons), but the elevation angle changes over the observation. For the extreme elevation angles of the solar observation, the sun may not fully illuminate the on-board diffuser, which will affect data quality. Therefore, the averaging can be limited to a specific elevation angle range. This dataset specifies the maximum elevation angle of the sun pointing vector in the optical alignment reference frame, for which Solar Irradiances will be included in the average.
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	-180 – 180 (checked)
Values:	Typical value = 3.0
Units:	degree
Used in:	Irradiance Averaging
Variable Name:	elevation_max

4.3.20 Irradiance Sensitivity Function backup wavelength coefficients (obsolete)

4.3.21 Irradiance Sensitivity Function high azimuth

Description:	Upper azimuth angle that will be used for normalisation of the azimuth angle of the sun pointing vector in the optical alignment reference frame for determining the azimuth angle dependency of the irradiance sensitivity coefficients.
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	-180 – 180
Values:	Typical value = 37.75
Units:	degree
Used in:	Calculation of Delta Irradiance Coefficients
Variable Name:	β_{max}

4.3.22 Irradiance Sensitivity Function Backup Diffusor high azimuth limit

Description:	Upper azimuth angle below which the azimuth angle of the sun pointing vector in the optical alignment reference frame will be clipped
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	-180 – 180
Values:	Typical value = 31.2
Units:	degree
Used in:	Calculation of Delta Irradiance Coefficients
Variable Name:	high_limit_β_{dif}

4.3.23 Irradiance Sensitivity Function Regular Diffusor low azimuth limit

Description:	Upper azimuth angle below which the azimuth angle of the sun pointing vector in the optical alignment reference frame will be clipped
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	-180 – 180
Values:	Typical value = 31.2
Units:	degree
Used in:	Calculation of Delta Irradiance Coefficients
Variable Name:	high_limit_β_{dif}

4.3.24 Irradiance Sensitivity Function Volume Diffusor low azimuth limit

Description:	Upper azimuth angle below which the azimuth angle of the sun pointing vector in the optical alignment reference frame will be clipped
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	-180 – 180
Values:	Typical value = 31.2
Units:	degree
Used in:	Calculation of Delta Irradiance Coefficients
Variable Name:	high_limit_β_{dif}

4.3.25 Irradiance Sensitivity Function high elevation

Description:	Upper elevation angle that will be used for normalisation of the elevation angle of the sun pointing vector in the optical alignment reference frame for determining the elevation angle dependency of the irradiance sensitivity coefficients.
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	-180 – 180
Values:	Typical value = 3.0
Units:	degree
Used in:	Calculation of Delta Irradiance Coefficients
Variable Name:	α_{max}

4.3.26 Irradiance Sensitivity Function high lambda

Description:	Upper wavelength that will be used for normalisation of the pixel wavelength for determining the wavelength dependency of the irradiance sensitivity coefficients.
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	200 – 800
Values:	Typical value = 500.0
Units:	nm
Used in:	Calculation of Delta Irradiance Coefficients
Variable Name:	λ_{max}

4.3.27 Irradiance Sensitivity Function low azimuth

Description:	Lower azimuth angle that will be used for normalisation of the azimuth angle of the sun pointing vector in the optical alignment reference frame for determining the azimuth angle dependency of the irradiance sensitivity coefficients.
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	-180 – 180
Values:	Typical value = 13.75
Units:	degree
Used in:	Calculation of Delta Irradiance Coefficients
Variable Name:	β_{min}

4.3.28 Irradiance Sensitivity Function Backup Diffusor low azimuth limit

Description:	Lower azimuth angle below which the azimuth angle of the sun pointing vector in the optical alignment reference frame will be clipped
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	-180 – 180
Values:	Typical value = 18.3
Units:	degree
Used in:	Calculation of Delta Irradiance Coefficients
Variable Name:	low_limit β_{dif}

4.3.29 Irradiance Sensitivity Function Regular Diffusor low azimuth limit

Description:	Lower azimuth angle below which the azimuth angle of the sun pointing vector in the optical alignment reference frame will be clipped
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	-180 – 180
Values:	Typical value = 18.3
Units:	degree
Used in:	Calculation of Delta Irradiance Coefficients
Variable Name:	low_limit_β_{dif}

4.3.30 Irradiance Sensitivity Function Volume Diffusor low azimuth limit

Description:	Lower azimuth angle below which the azimuth angle of the sun pointing vector in the optical alignment reference frame will be clipped
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	-180 – 180
Values:	Typical value = 18.3
Units:	degree
Used in:	Calculation of Delta Irradiance Coefficients
Variable Name:	low_limit_β_{dif}

4.3.31 Irradiance Sensitivity Function low elevation

Description:	Lower elevation angle that will be used for normalisation of the elevation angle of the sun pointing vector in the optical alignment reference frame for determining the elevation angle dependency of the irradiance sensitivity coefficients.
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	-180 – 180
Values:	Typical value = -3.0
Units:	degree
Used in:	Calculation of Delta Irradiance Coefficients
Variable Name:	α_{min}

4.3.32 Irradiance Sensitivity Function low lambda

Description:	Lower wavelength that will be used for normalisation of the pixel wavelength for determining the wavelength dependency of the irradiance sensitivity coefficients.
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	200 – 800
Values:	Typical value = 250.0
Units:	nm
Used in:	Calculation of Delta Irradiance Coefficients
Variable Name:	λ_{min}

4.3.33 Irradiance Sensitivity Function regular wavelength coefficients (obsolete)

4.3.34 Irradiance Sensitivity Function volume wavelength coefficients (obsolete)

4.3.35 Nominal Attitude LOS Vector

Description:	Nominal Attitude Line-Of-Sight Vector Unit vector in the spacecraft reference frame the would point to the spacecraft sub satellite point for the nominal attitude of the spacecraft. The difference between the ground-pixel pointed to by this vector and the actual sub satellite point will be used to determine the spacecraft manoeuvre flag in the geolocation algorithm.
Type:	DFNT_FLOAT32
Cardinality:	{ 3 }
Range:	-
Values:	-
Units:	dimensionless
Used in:	Geo-location
Variable Name:	Nominal_LOS_nadir(n)

4.3.36 Northern Most Bounding Latitude Solar Eclipses

Description:	Northern Most Bounding Latitude Solar Eclipses. For description, see section 4.3.12. This dataset specifies for each of the solar eclipses the bounding latitude at the north side of the spatial bounding box.
Type:	DFNT_FLOAT32
Cardinality:	{ UNDEF }
Range:	-90 – 90
Values:	-
Units:	degree
Used in:	Geo-location
Variable Name:	SOL_eclips_north(n)

4.3.37 NOSE Block Interval

Description:	Interval between the start times of two blocks for the Nominal Orbit Spatial Extent (NOSE) geospatial coverage metadata.
Type:	DFNT_UINT32
Cardinality:	{ 1 }
Range:	1 – 6000 (checked)
Values:	Typical value = 120; This is related to NOSE Number of Blocks per Path, described in section 4.3.39.
Units:	s
Used in:	Metadata
Variable Name:	NOSE_block_interval

4.3.38 NOSE Global Path Offset

Description:	The NOSE block number for the first NOSE path that is used for geospatial coverage of Global and Spectral Zoom measurements
Type:	DFNT_UINT32
Cardinality:	{ 1 }
Range:	0 – 500 (checked)
Values:	Typical value = 1
Units:	dimensionless
Used in:	Metadata
Variable Name:	offset_global_NOSE_paths

4.3.39 NOSE Number of Blocks per Path

Description:	The number of NOSE blocks that make up a single NOSE path
Type:	DFNT_UINT32
Cardinality:	{ 1 }
Range:	1 – 500 (checked)
Values:	Typical value = 50; The number of blocks multiplied by the block interval (see NOSE Block Interval in section 4.3.37) must be approximately equal to the orbit duration (which is approximately 98.8 minutes for EOS-AURA).
Units:	blocks / NOSE path
Used in:	Metadata
Variable Name:	nr_blocks_per_NOSE_path

4.3.40 NOSE Number of Paths

Description:	Number of NOSE (Nominal Orbit Spatial Extent) paths
Type:	DFNT_UINT32
Cardinality:	{ 1 }
Range:	1 – 500 (checked)
Values:	Typical value = 233 (equal to the orbital repeat cycle of EOS-AURA)
Units:	dimensionless
Used in:	Metadata
Variable Name:	nr_NOSE_paths

4.3.41 NOSE Orbit Number to Path Number Shift

Description:	Shift value for converting Orbit number to NOSE Path number. The NOSE Path number is determined by the GDPS by taking the Granule number (from the PCF), incremented with NOSE Orbit Number to Path Number Shift (section 4.3.41), taking the modulo after dividing it by NOSE Number of Paths (section 4.3.40) and incrementing that result by NOSE Global Path Offset (section 4.3.38) or NOSE Spatial Zoom Path Offset (section 4.3.42) depending on the type of measurement.
Type:	DFNT_UINT32
Cardinality:	{ 1 }
Range:	0 – 500 (checked)
Values:	Depends on launch date and time and the final orbital parameters for EOS-AURA.
Units:	dimensionless
Used in:	Metadata
Variable Name:	NOSE_orbit2path_shift

4.3.42 NOSE Spatial Zoom Path Offset

Description:	The NOSE block number for the first NOSE path that is used for geospatial coverage of Spatial Zoom measurements
Type:	DFNT_UINT32
Cardinality:	{ 1 }
Range:	0 – 500 (checked)
Values:	Typical value = 234 (equal to NOSE Number of Paths (section 4.3.40), incremented by 1)
Units:	dimensionless
Used in:	Metadata
Variable Name:	offset_spatial_NOSE_paths

4.3.43 OPB Temperature polynomial coefficients

Description:	OPB temperature conversion polynomial coefficients for conversion of Engineering units (LSB) to physical units (K).
Type:	DFNT_FLOAT32
Cardinality:	{ 4, UNDEF }
Range:	-
Values:	Each row x (slowest iterating dimension) contains the polynomial coefficients (along the fastest iterating dimension) for OPB Thermistor x. There are a total of 4 thermistors. The order of the thermistors for this OPF dataset is equal to the order in the ELU Engineering Data.
Units:	K / LSB_n
Used in:	Preparator
Variable Name:	$OPB_TEMP_c(x)_n$

4.3.44 OPB Temperature weighing map

Description:	Relative OPB temperature weighing coefficients
Type:	DFNT_FLOAT32
Cardinality:	{ 4 }
Range:	-
Values:	Each element x contains the weighing factor for OPB Thermistor x. There are a total of 4 thermistors. The order of the thermistors for this OPF dataset is equal to the order in the Engineering Data. The sum of the values is typically 1.
Units:	dimensionless
Used in:	Preparator
Variable Name:	OPB_TEMP_WEIGH(x)

4.3.45 South Atlantic Anomaly Latitude Range

Description:	South Atlantic Anomaly (SAA) Latitude Range
Type:	DFNT_FLOAT32
Cardinality:	{ 2 }
Range:	-90 – 90 (checked at -180 – 180)
Values:	Two values, the first specifying the southern most bounding Latitude and the second specifying the northern most bounding Latitude. Typical values = -63 to 7 degrees
Units:	degree
Used in:	Geo-location
Variable Name:	SAA_lat_range(n)

4.3.46 South Atlantic Anomaly Longitude Range

Description:	South Atlantic Anomaly (SAA) Longitude Range
Type:	DFNT_FLOAT32
Cardinality:	{ 2 }
Range:	-180 – 180 (checked)
Values:	Two values, the first specifying the western most mounding latitude and the second specifying the eastern most bounding latitude. Typical values = -98 to 46 degrees
Units:	degree
Used in:	Geo-location
Variable Name:	SAA_lon_range(n)

4.3.47 Southern Most Bounding Latitude Solar Eclipses

Description:	Southern Most Bounding Latitude Solar Eclipses For description, see section 4.3.12. This dataset specifies for each of the solar eclipses the bounding latitude at the south side of the spatial bounding box.
Type:	DFNT_FLOAT32
Cardinality:	{ UNDEF }
Range:	-90 – 90
Values:	-
Units:	degree
Used in:	Geo-location
Variable Name:	SOL_eclips_south(n)

4.3.48 Spacecraft to OAC rotation matrix

Description:	Rotation Matrix for rotating a vector in the spacecraft reference frame to the optical alignment reference frame.
Type:	DFNT_FLOAT32
Cardinality:	{ 3, 3 }
Range:	0.0 – 1.0
Values:	-
Units:	dimensionless
Used in:	Calculation of Solar Geolocation parameters
Variable Name:	R_{zyx}

4.3.49 Spectral Calibration Scaling Factors for Direct fit

Description:	Spectral Calibration Scaling Factors for Direct fit. These are used in the spectral calibration algorithm to scale the linear fit parameters for the direct fit method.
Type:	DFNT_FLOAT32
Cardinality:	{ 5 }
Range:	>= 0 (checked)
Values:	-
Units:	dimensionless
Used in:	Spectral Calibration
Variable Name:	$sf_{direct,n}$

4.3.50 Spectral Calibration Scaling Factors for DOAS fit

Description:	Spectral Calibration Scaling Factors for DOAS fit. These are used in the spectral calibration algorithm to scale the linear fit parameters for the DOAS fit method.
Type:	DFNT_FLOAT32
Cardinality:	{ 6 }
Range:	>= 0 (checked)
Values:	-
Units:	dimensionless
Used in:	Spectral Calibration
Variable Name:	$sf_{DOAS,n}$

4.3.51 Spectral Straylight Offset Wavelengths

Description:	Wavelength offset that is used for normalisation of the wavelengths in the evaluation of the polynomials for calculating the stray light correction coefficients for spectral stray light. One value must be specified for each stray light source.
Type:	DFNT_FLOAT32
Cardinality:	{ UNDEF }
Range:	0 – 1000 (checked)
Values:	Number of entries is equal to number of stray light sources.
Units:	nm
Used in:	Calculation of Stray light correction coefficients
Variable Name:	$\lambda_{offset}(n)$

4.3.52 Spectral Straylight Polynomial Coefficients

Description:	Filter polynomial coefficients for calculating the stray light correction coefficients for spectral stray light. A set of values must be specified for each stray light source.
Type:	DFNT_FLOAT32
Cardinality:	{ UNDEF, UNDEF }
Range:	-
Values:	Number of rows (slowest iterating dimension) is equal to number of stray light sources. Each row contains one set of polynomial coefficients along the fastest iterating dimension. In case the different stray light sources require a different number of polynomial coefficients, the fastest iterating dimension should be set to the highest number of coefficients used and unused entries in the dataset should be filled with zeros.
Units:	dimensionless
Used in:	Calculation of Stray light correction coefficients
Variable Name:	$c_F(p)_n$

4.3.53 Spectral Straylight Row Translation Table

Description:	Row translation table between sub-channels for spectral straylight correction.
Type:	DFNT_INT32
Cardinality:	{ UNDEF, 3 }
Range:	-1 – 576
Values:	Per row: index values of CCD rows that – between the sub-channels – translate to each other. Columns correspond to sub-channels; 0=UV1, 1=UV2, 2=VIS.
Units:	dimensionless
Used in:	Calculation of Stray light correction coefficients
Variable Name:	row_trans(jjj,m)

4.3.54 Spectral Straylight Source Subchannel

Description:	Source sub-channel for each stray light source for spectral direction stray light.
Type:	DFNT_UINT32
Cardinality:	{ UNDEF }
Range:	0 – 2 (checked)
Values:	Number of entries is equal to number of stray light sources. A value of 0=UV1, 1=UV2, 2=VIS.
Units:	dimensionless
Used in:	Calculation of Stray light correction coefficients
Variable Name:	$m_{source}(n)$

4.3.55 Spectral Straylight Source Wavelength Range

Description:	Wavelength range that is used for calculating the integrated signal for each stray light source for the calculation of spectral direction stray light.
Type:	DFNT_FLOAT32
Cardinality:	{ UNDEF, 2 }
Range:	0 – 1000 (checked)
Values:	Each row (slowest iterating dimension) contains λ_{min}, λ_{max} pairs. The number of rows is equal to number of stray light sources
Units:	nm
Used in:	Calculation of Stray light correction coefficients
Variable Name:	$\lambda_{src_range}(n,v)$

4.3.56 Spectral Straylight Target Subchannel

Description:	Target Source sub-channel for each stray light source for spectral direction stray light.
Type:	DFNT_UINT32
Cardinality:	{ UNDEF }
Range:	0 – 2 (checked)
Values:	Number of entries is equal to number of stray light sources. A value of 0=UV1, 1=UV2, 2=VIS.
Units:	dimensionless
Used in:	Calculation of Stray light correction coefficients
Variable Name:	$m_{target}(n)$

4.3.57 Spectral Straylight Unbinned Source Windows

Description:	Source window size for spectral direction straylight source n
Type:	DFNT_INT32
Cardinality:	{ UNDEF }
Range:	-1 – 577
Values:	Number of entries is equal to number of stray light sources. A value >= 0 specifies half-width of the window, with the central row not counted for. A value -1 means maximal window size, i.e. the window covers the optics region fully.
Units:	dimensionless
Used in:	Calculation of Stray light correction coefficients
Variable Name:	source_win(n)

4.3.58 Spectral Straylight Unbinned Target Windows

Description:	Source window size for spectral direction straylight source n
Type:	DFNT_INT32
Cardinality:	{ UNDEF }
Range:	-1 – 577
Values:	Number of entries is equal to number of stray light sources. A value >= 0 specifies half-width of the window, with the central row not counted for. A value -1 means maximal window size, i.e. the window covers the optics region fully.
Units:	dimensionless
Used in:	Calculation of Stray light correction coefficients
Variable Name:	target_win(n)

4.3.59 Start Times Solar Eclipses

Description:	Start Times Solar Eclipses For description, see section 4.3.12. This dataset specifies for each of the solar eclipses the start time of the solar eclipse.
Type:	DFNT_CHAR8
Cardinality:	{ UNDEF }
Range:	-
Values:	This dataset is stored as a string, containing a comma separated list of UTC date/time stamps in CCSDS ascii timecode A format.
Units:	UTC
Used in:	Geo-location
Variable Name:	SOL_eclips_start(n)

4.3.60 Valid From

Description:	Start of validity range of OPF. The GDPS will check the L1b granule start and stop times against the “valid from” and “valid to” fields in the OPF. When both the granule start time and granule stop time lie between “valid from” and “valid to”, the OPFValid Archive Metadata attribute of the OMI L1b products will be set to “TRUE”, otherwise to “FALSE”
Type:	DFNT_CHAR8
Cardinality:	{ UNDEF }
Range:	-
Values:	UTC date/time stamp in CCSDS ascii timecode A format Example: 2004-04-01T00:00:00.00000Z
Units:	UTC
Used in:	Metadata
Variable Name:	OPF_valid_from

4.3.61 Valid To

Description:	End of validity range of OPF. The GDPS will check the L1b granule start and stop times against the “valid from” and “valid to” fields in the OPF. When both the granule start time and granule stop time lie between “valid from” and “valid to”, the OPFValid Archive Metadata attribute of the OMI L1b products will be set to “TRUE”, otherwise to “FALSE”
Type:	DFNT_CHAR8
Cardinality:	{ UNDEF }
Range:	-
Values:	UTC date/time stamp in CCSDS ascii timecode A format Example: 2004-04-01T00:00:00.00000Z
Units:	UTC
Used in:	Metadata
Variable Name:	OPF_valid_to

4.3.62 Version

Description:	Identification string for the version of the OPF. This version string will be included in the OPFVersion Archive Metadata attribute of the OMI L1b products.
Type:	DFNT_CHAR8
Cardinality:	{ UNDEF }
Range:	-
Values:	Example: Version 0005 Creation date "Mar 31 2004" "15:54:10"
Units:	dimensionless
Used in:	Metadata
Variable Name:	OPF_version

4.3.63 Western Most Bounding Longitude Solar Eclipses

Description:	Western Most Bounding Longitude Solar Eclipses For description, see section 4.3.12. This dataset specifies for each of the solar eclipses the bounding longitude at the west side of the spatial bounding box.
Type:	DFNT_FLOAT32
Cardinality:	{ UNDEF }
Range:	-180 – 180
Values:	-
Units:	degree
Used in:	Geo-location
Variable Name:	SOL_eclips_west(n)

4.4 Group UV/General/Image data

4.4.1 Dark Current Background Normal

Description:	Dark current background images. Instead of calculating and estimate of the dark current for a specific measurement based on a generic dark current characterisation of the instrument, the GDPS can use dark background images that were obtained with similar instrument settings as the measurement that is being corrected. This means, that such background images can be stored for each type of measurement that can be done with the instrument. To match a measurement with a background image, the Instrument Configuration ID (ELU 0x03) and Instrument Configuration Version (ELU 0x04) fields in the engineering data are used. When a background image for a specific Instrument Configuration ID / Instrument Configuration Version combination cannot be found in the OPF, the GDPS will use the calculated estimate based on a generic dark current characterisation of the instrument as fallback for dark current correction. For the background image subtraction, it is of course required that the background image has the same extents as measurement for which it is intended. This means that the background images are not stored at CCD resolution, as opposed to most other images with correction coefficients. From a software architecture point-of-view, it was required to have a fixed, predefined set of datasets in the OPF in which the background images are stored. Given the wide variety of measurement configurations that can be used with the instrument, and hence the large number of background images that will need to be stored in the OPF, efficient usage of storage space was also a design constraint. The balance was found in created 3 different datasets in the OPF for storing the background images, which closely match the extents for the bulk of the OMI measurements. These three datasets are Dark Current Background Normal (section 4.4.1), which can be used for storing background images that use “global” or “spatial zoom” modes, Dark Current Background Spectral (section 4.4.5), which can be used for storing background images that use “spectral zoom” mode and Dark Current Background Unbinned (section 4.4.6), which can be used for storing background images that use “unbinned” mode or any other images that cannot be stored in the other two background image datasets. In case a background image is not large enough to fully fill the extents of the OPF datasets, the excess elements should be padded with 0 values. The background datasets must be valid for the temperature specified by Dark Current Detector Reference Temperature (section 4.5.8). A temperature correction will be applied by the GDPS when the actual detector temperature for the measurement deviates from the reference temperature. For each background image dataset in the OPF, there is a corresponding dataset that describes the contents of the background image dataset. These “describing” datasets are Dark Current Background Parameters Normal (section 4.4.2), Dark Current Background Parameters Spectral (section 4.4.3) and Dark Current Background Parameters Unbinned (section 4.4.4).
Type:	DFNT_FLOAT32
Cardinality:	{ UNDEF, 65, 814}
Range:	-

Values:	Each plane (slowest iterating dimension) contains a complete dark current background image. Measurements which have less than 65 rows or less than 814 columns should be padded with 0 values. When there is not data available for this dataset, it must still be present in the OPF but it is allowed to have size “0” for the first / slowest iterating dimension.
Units:	e
Used in:	Calculation of Dark Current Correction coefficients
Variable Name:	$S_{bkgnd_nml}(i,j)_{v,k}$

4.4.2 Dark Current Background Parameters Normal

Description:	See also Dark Current Background Normal in section 4.4.1. This dataset is used to describe the contents of the OPF dataset Dark Current Background Normal (section 4.4.1). The number of rows (slowest iterating dimension) in this dataset must be equal to the number of background images (planes, slowest iterating dimension) in the corresponding OPF dataset in which the dark current background images are stored. Each row describes the corresponding background image, where the first column specifies the Instrument Configuration ID of the measurement for which the background image is intended to be used; the second column specifies the Instrument Configuration Version of the measurement for which the background image is intended to be used; the third column contains the number of rows for which valid values are stored in the background image and the fourth column contains the number of column for which valid values are stored in the background image. These last two parameters, rows and columns, must match the measurement that is being corrected in the GDPS.
Type:	DFNT_UINT32
Cardinality:	{ UNDEF, 4 }
Range:	0 – 1000 (checked)
Values:	When there is not data available for this dataset, it must still be present in the OPF but it is allowed to have size “0” for the first / slowest iterating dimension.
Units:	dimensionless
Used in:	Calculation of Dark Current Correction coefficients
Variable Name:	$P_{bkgnd_nml}(n)_{v,k}$

4.4.3 Dark Current Background Parameters Spectral

Description:	See Dark Current Background Parameters Normal in section 4.4.2. This dataset is used to describe the contents of the OPF dataset Dark Current Background Spectral (section 4.4.5).
Type:	DFNT_UINT32
Cardinality:	{ UNDEF, 4 }
Range:	0 – 1000 (checked)
Values:	When there is not data available for this dataset, it must still be present in the OPF but it is allowed to have size “0” for the first / slowest iterating dimension.
Units:	dimensionless
Used in:	Calculation of Dark Current Correction coefficients
Variable Name:	$P_{bkgnd_spczm}(n)_{w,k}$

4.4.4 Dark Current Background Parameters Unbinned

Description:	See Dark Current Background Parameters Normal in section 4.4.2. This dataset is used to describe the contents of the OPF dataset Dark Current Background Unbinned (section 4.4.6).
Type:	DFNT_UINT32
Cardinality:	{ UNDEF, 4 }
Range:	0 – 1000 (checked)
Values:	When there is not data available for this dataset, it must still be present in the OPF but it is allowed to have size “0” for the first / slowest iterating dimension.
Units:	dimensionless
Used in:	Calculation of Dark Current Correction coefficients
Variable Name:	$P_{bkgnd_unb}(n)_{x,k}$

4.4.5 Dark Current Background Spectral

Description:	See also Dark Current Background Normal in section 4.4.1.
Type:	DFNT_FLOAT32
Cardinality:	{ UNDEF, 125, 400}
Range:	-
Values:	Each plane (slowest iterating dimension) contains a complete dark current background image. Measurements which have less than 125 rows or less than 400 columns should be padded with 0 values. When there is not data available for this dataset, it must still be present in the OPF but it is allowed to have size “0” for the first / slowest iterating dimension.
Units:	e
Used in:	Calculation of Dark Current Correction coefficients
Variable Name:	$S_{bkgnd_spczm}(i,j)_{w,k}$

4.4.6 Dark Current Background Unbinned

Description:	See also Dark Current Background Normal in section 4.4.1. N.B. Due to architecture constraints in the GDPS, the size of images in the L1B output products will never exceed the CCD extents, which are defined at 577 rows x 814 columns. On the other hand, unbinned measurements are typically acquired at 581 rows x 814 columns. This means, that it may not be possible to obtain the background data for the last 4 rows of the unbinned measurement. However, as a result of the same architecture constraint, dark current correction will also be limited to these CCD extents and as a result the coefficients that cannot be obtained from the L1B data are actually not relevant. For unbinned measurements exceeding the CCD extents, this datasets should therefore be padded with 0 values. The rows and columns are specified in Dark Current Background Parameters Unbinned (section 4.4.4) should be set to the number of rows and columns with which the unbinned measurement will be acquired (i.e. typically 581 rows x 814 columns).
Type:	DFNT_FLOAT32
Cardinality:	{ UNDEF, 581, 814}
Range:	-
Values:	Each plane (slowest iterating dimension) contains a complete dark current background image. Measurements which have less than 581 rows or less than 814 columns should be padded with 0 values. When there is not data available for this dataset, it must still be present in the OPF but it is allowed to have size “0” for the first / slowest iterating dimension.
Units:	e
Used in:	Calculation of Dark Current Correction coefficients
Variable Name:	$S_{bkgnd_unb}(i,j)_{x,k}$

4.4.7 LED Reference Image

Description:	LED reference image used for dead pixel identification purposes
Type:	DFNT_FLOAT32
Cardinality:	{577, 814}
Range:	-
Values:	Complete CCD LED image
Units:	e/s
Used in:	Calculation of measurement resolution LED reference image
Variable Name:	$S_{LEDRefOPF}(ii,jj)_k$

4.4.8 Relative Pixel to Pixel Sensitivity Coefficients

Description:	Relative Pixel to Pixel Sensitivity
Type:	DFNT_FLOAT32
Cardinality:	{577, 814}
Range:	0.7 – 1.3
Values:	-
Units:	dimensionless
Used in:	Calculation of Relative pixel-to-pixel correction coefficients
Variable Name:	$c_pp_CCD(ii,jj)_k$

4.4.9 Pixel to Pixel Noise

Description:	Pixel to Pixel Noise
Type:	DFNT_FLOAT32
Cardinality:	{577, 814}
Range:	-
Values:	-
Units:	e/s
Used in:	Calculation of pixel to pixel noise
Variable Name:	$px2px_noise_CCD(ii,jj)_k$

4.5 Group UV/General/Instrument parameters

4.5.1 ADC Conversion Factor

Description:	ADC conversion factor
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	500 - 1000
Values:	Typical value = 819.2 ADU/V (4096/5)
Units:	ADU/V
Used in:	ADC conversion
Variable Name:	$f_{ADC,k}$

4.5.2 Bad and Dead Pixel Map Image

Description:	Bad and Dead Pixel Map for the CCD Image Section. Each element in this matrix contains bad and dead pixel flags for a single pixel in the CCD Image Section (including the Read-out Register).
Type:	DFNT_UINT32
Cardinality:	{577, 814}
Range:	0x00000000 – 0xFFFFFFFF
Values:	-
Units:	Each bit represents a flag. How the flags shall be interpreted in the GDPS is specified by means of the BDPM Dead Pixel Mask (section 4.5.4) and the BDPM RTS Pixel Mask (section 4.5.5).
Used in:	Dead pixels flagging, RTS possibility flagging
Variable Name:	$BDPM_Image(ii,jj)_k$

4.5.3 Bad and Dead Pixel Map Storage

Description:	Bad and Dead Pixel Map for the CCD Storage Section. Each element in this matrix contains bad and dead pixel flags for a single pixel in the CCD Storage Section (including the Read-out Register).
Type:	DFNT_UINT32
Cardinality:	{577, 814}
Range:	0x00000000 – 0xFFFFFFFF
Values:	-
Units:	Each bit represents a flag. How the flags shall be interpreted in the GDPS is specified by means of the BDPM Dead Pixel Mask (section 4.5.4) and the BDPM RTS Pixel Mask (section 4.5.5).
Used in:	Dead pixels flagging, RTS possibility flagging
Variable Name:	$BDPM_Storage(ii,jj)_k$

4.5.4 BDPM Dead Pixel Mask

Description:	Mask of flags for Dead Pixels in the Bad and Dead Pixel Map
Type:	DFNT_UINT32
Cardinality:	{ 1 }
Range:	0x00000000 – 0xFFFFFFFF
Values:	-
Units:	Each bit represents a flag. For each bit that is set, entries in the Bad and Dead Pixel Map that have the same bit set shall be treated as dead pixels in the GDPS. That is, if the value of this parameters is bitwise AND-ed with an entry in the Bad and Dead Pixel map, and the result is not equal to zero, then the corresponding pixel shall be treated as a dead pixel.
Used in:	Dead pixels flagging
Variable Name:	$BDPM_Dead_pxl_mask_k$

4.5.5 BDPM RTS Pixel Mask

Description:	Mask of flags for RTS Pixels in the Bad and Dead Pixel Map
Type:	DFNT_UINT32
Cardinality:	{ 1 }
Range:	0x00000000 – 0xFFFFFFFF
Values:	-
Units:	Each bit represents a flag. For each bit that is set, entries in the Bad and Dead Pixel Map that have the same bit set shall be treated as possible RTS pixels in the GDPS. That is, if the value of this parameters is bitwise AND-ed with an entry in the Bad and Dead Pixel map, and the result is not equal to zero, then the corresponding pixel shall be treated as a possible RTS pixel.
Used in:	RTS possibility flagging
Variable Name:	$BDPM_RTS_pxl_mask_k$

4.5.6 CCD Temperature polynomial coefficients

Description:	Temperature conversion polynomial coefficients for conversion of Engineering units (LSB) to physical units (K) for the temperature sensor on the UV Channel CCD.
Type:	DFNT_FLOAT32
Cardinality:	{ UNDEF }
Range:	-
Values:	-
Units:	K / LSB_n
Used in:	Preparator
Variable Name:	$CCD_TEMP_c_{k,n}$

4.5.7 Coefficients non-linearity polynomials

Description:	Polynomial coefficients for characterisation of the non-linearity of the CCD output amplifier.
Type:	DFNT_FLOAT32
Cardinality:	{ UNDEF }
Range:	-
Values:	-
Units:	dimensionless
Used in:	Non-linearity correction
Variable Name:	$nonlin_coeff_{n,k}$

4.5.8 Dark Current Detector Reference Temperature

Description:	Reference temperature for the dark current data in the OPF. All dark current images (Dark Current Background Normal (section 4.4.1), Dark Current Background Spectral (section 4.4.5), Dark Current Background Unbinned (section 4.4.6), Dark Current Image (section 4.5.10), Dark Current Image Column Average (section 4.5.11), Dark Current Storage Column Average (section 4.5.14) and Dark Current Readout (section 4.5.12)) should be normalised to this reference temperature. A temperature correction will be applied the dark current data, taking the CCD detector temperature relative to this reference temperature, using the polynomial coefficients specified in Dark Current Detector Temperature Coefficients (section 4.5.9).
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	260K – 300K
Values:	-
Units:	K
Used in:	Calculation of Dark Current Correction coefficients
Variable Name:	$T_{dark_ref,k}$

4.5.9 Dark Current Detector Temperature Coefficients

Description:	Polynomial coefficients for applying a temperature correction to dark current correction coefficients. See also Dark Current Detector Reference Temperature section 4.5.8.
Type:	DFNT_FLOAT32
Cardinality:	{ UNDEF }
Range:	-
Values:	-
Units:	dimensionless
Used in:	Calculation of Dark Current Correction coefficients
Variable Name:	$a_{p,k}$

4.5.10 Dark Current Image

Description:	Dark current characterisation for the pixels in the image section of the CCD. These coefficients will be used for calculating an estimate of the dark current build up during exposure, in case for a specific measurement a direct background image subtraction cannot be used. N.B. The coefficients in this dataset must be normalised for the Dark Current Detector Reference Temperature (section 4.5.8).
Type:	DFNT_FLOAT32
Cardinality:	{577, 814}
Range:	0 – 4000
Values:	-
Units:	e/s
Used in:	Calculation of Dark Current Correction coefficients
Variable Name:	$S_image(ii,jj)_k$

4.5.11 Dark Current Image Column Average

Description:	Dark current characterisation of the average per column for the pixels in the image section of the CCD. These coefficients will be used for calculating an estimate of the dark current build up in the image section during frame transfer, in case for a specific measurement a direct background image subtraction cannot be used. N.B. The coefficients in this dataset must be normalised for the Dark Current Detector Reference Temperature (section 4.5.8).
Type:	DFNT_FLOAT32
Cardinality:	{ 814 }
Range:	0 – 4000
Values:	-
Units:	e/s
Used in:	Calculation of DarkCurrent Correction coefficients
Variable Name:	$S_image_col_avg(ii)_k$

4.5.12 Dark Current Readout

Description:	Dark current characterisation of the average over all the pixels in the read-out register of the CCD. These coefficients will be used for calculating an estimate of the dark current build up in the read-out register during read-out, in case for a specific measurement a direct background image subtraction cannot be used. N.B. The coefficients in this dataset must be normalised for the Dark Current Detector Reference Temperature (section 4.5.8).
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	0 – 4000
Values:	-
Units:	e/s
Used in:	Calculation of DarkCurrent Correction coefficients
Variable Name:	$S_readout_k$

4.5.13 Dark Current Region

Description:	Region that will be used for calculating the dark current values that are written to the L1B Calibration product. This region is also used for the dark current flagging algorithm.
Type:	DFNT_UINT32
Cardinality:	{ 4 }
Range:	0 – 813 (checked)
Values:	-
Units:	dimensionless
Used in:	Preparator
Variable Name:	dark_current_region

4.5.14 Dark Current Storage Column Average

Description:	Dark current characterisation of the average per column for the pixels in the storage section of the CCD. These coefficients will be used for calculating an estimate of the dark current build up in the storage section during frame transfer and read-out, in case for a specific measurement a direct background image subtraction cannot be used. N.B. The coefficients in this dataset must be normalised for the Dark Current Detector Reference Temperature (section 4.5.8).
Type:	DFNT_FLOAT32
Cardinality:	{ 814 }
Range:	0 – 4000
Values:	-
Units:	e/s
Used in:	Calculation of DarkCurrent Correction coefficients
Variable Name:	$S_storage_col_avg(ii)_k$

4.5.15 DEM ELU Gain

Description:	Gain Factor for signals when transmitted from Detector Module to Electronic Unit
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	0.05 – 50 (checked at > 0.05)
Values:	Typical value = 0.8
Units:	dimensionless
Used in:	DEM Saturation Flagging
Variable Name:	$A_DEM_ELU_k$

4.5.16 DEM RC Time

Description:	Detector Module (DEM) decoupling time
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	0 – 1.00 e-2 (checked at ≠ 0)
Values:	Typical value = 16.07 e-3
Units:	S
Used in:	DEM Saturation Flagging
Variable Name:	$DEM_RC_time_k$

4.5.17 DEM Relative Gains

Description:	Gains of the Detector Module (DEM) of the instrument, relative to the lowest gain.
Type:	DFNT_FLOAT32
Cardinality:	{ 4 }
Range:	1 – 50 (checked at >= 1)
Values:	One value per gain code, typical values: ~11.5, ~38.5, 1.0, ~3.3
Units:	dimensionless
Used in:	Electronic conversion, Offset Calculation
Variable Name:	$f_{dem,relative,g,k}$

4.5.18 DEM St1 Gain

Description:	DEM Stage1 Gain Factor
Type:	DFNT_FLOAT32
Cardinality:	{ 4 }
Range:	0.05 – 50 (checked at > 0.05)
Values:	One value per gain code g, typical values: 1.0, 11.5, 1.0, 11.5
Units:	dimensionless
Used in:	DEM Saturation Flagging
Variable Name:	$A_DEM_st1(g)_k$

4.5.19 DEM St2 Gain

Description:	DEM Stage2 Gain Factor
Type:	DFNT_FLOAT32
Cardinality:	{ 4 }
Range:	0.05 – 50 (checked at > 0.05)
Values:	One value per gain code g, typical values: 1.366, 1.366, 4.563, 4,563
Units:	dimensionless
Used in:	DEM Saturation Flagging
Variable Name:	$A_DEM_st2(g)_k$

4.5.20 Duty Cycle

Description:	Time Ratio: duration video signal relative to a full read-out cycle length
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	0 – 1 (checked)
Values:	Typical value = 0.5
Units:	dimensionless
Used in:	DEM Saturation Flagging
Variable Name:	k_cycle_k

4.5.21 Electronics Conversion Factor

Description:	Electronics Conversion Factor. Conversion factor for converting values in Volts at the ADC to electron charge on the output node of the CCD, for the lowest gain setting in the instrument. This factor takes into account the gain / conversion factor at the CCD output node, the absolute gain (for the lowest gain setting) of the Detector Module (DEM) and the gain of the ELU.
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	1.00e-08 – 1.00e-04 (checked at >= 1.00e-08)
Values:	Typical ~2e-6 V/e
Units:	V/e
Used in:	Electronic conversion, Offset Calculation
Variable Name:	$f_{electronics,k}$

4.5.22 ELU Gain Factor

Description:	Electronic Unit (ELU) Gain Factor. ADUs that give rise to a voltage gain of +1 V
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	-5.0 e+3 – 5.0 e+3 (checked at ≠ 0)
Values:	Typical value = -2914.4 (UV), typical value = -2913.6 (VIS)
Units:	ADU / V
Used in:	DEM Saturation Flagging
Variable Name:	A_ELU_k

4.5.23 ELU Offset Value

Description:	Offset value for signal received at ELU
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	-500 – 500
Values:	Typical value = 78.65 (UV), typical value = 71.54 (VIS)
Units:	ADU
Used in:	DEM Saturation Flagging
Variable Name:	$N_ELU_offset_k$

4.5.24 Expected Small Pixel Column

Description:	Expected Small Pixel Column. The expected column on the CCD for which the co-adding is not performed. The data from this column can be used to monitor the ground albedo with a higher spatial resolution than the co-added images.
Type:	DFNT_UINT32
Cardinality:	{ 1 }
Range:	0 – 813 (checked)
Values:	-
Units:	dimensionless
Used in:	Calculation of Spectral calibration coefficients
Variable Name:	$Expctd_spc_col_k$

4.5.25 Exposure Smear Region

Description:	Exposure Smear region. The region on the CCD for which the exposure smear algorithms are carried out.
Type:	DFNT_UINT32
Cardinality:	{ 4 }
Range:	0 – 813 (checked)
Values:	-
Units:	dimensionless
Used in:	Preparator
Variable Name:	exposure_smear_region

4.5.26 Frame Transfer Time

Description:	Frame Transfer time (the time it takes to transfer an exposed image from the image section of the CCD to the storage section of the CCD).
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	>=0 (checked)
Values:	Typical value = 4.32e-3 s
Units:	s
Used in:	Exposure time division, Calculation of Dark Current Correction coefficients
Variable Name:	$t_{frametransfer}$

4.5.27 Gain Overshoot Correction Coefficients

Description:	Gain Overshoot Correction Coefficients. The dimensions of this dataset, in the order of slowest iterating dimension to fastest iterating dimension, are: source gain code, destination gain code, overshoot coefficient per column. That is, the overshoot coefficients for going from gain code 3 to gain code 2 are on row 2 of plane 3 in this datasets. The columns correspond to the columns read-out after the gain switch. Unused elements should be set to 0.
Type:	DFNT_FLOAT32
Cardinality:	{ 4, 4, UNDEF}
Range:	-
Values:	-
Units:	V
Used in:	Gain overshoot correction
Variable Name:	$f_{overshoot}(m)_{k,o,n}$

4.5.28 IMG Electronics Region

Description:	Definition of the electronics “image” region on the CCD. During read-out of a nominal measurement in OMI, several regions on the CCD can be distinguished, such as Upper and Lower Dark Current regions, Upper and Lower Straylight regions, Image region. For these different regions, different settings are applied in the electronics of the instrument, hence the name electronics regions. Since these regions have read-out settings, but often also different physical properties (e.g. the Dark Current regions have physical cover on the CCD that shields them from illumination), some of the algorithms have different behaviour for different regions. For the nominal measurements, the GDPS will use the settings in the engineering data of the instrument to determine the position and extents for each of these regions on the CCD. However, for the unbinned mode, several measurement are combined by using tricks in the electronics and as a result, the settings from the engineering data cannot be used. For these measurements, the electronic region definitions are read from this and other related datasets in the OPF.
Type:	DFNT_UINT32
Cardinality:	{ 4 }
Range:	0 – 813 (checked)
Values:	-
Units:	dimensionless
Used in:	Preparator
Variable Name:	electronic_region

4.5.29 LDA Electronics Region

Description:	Definition of the electronics “Lower Dark Area” region on the CCD. See also IMG Electronics Region in section 4.5.28.
Type:	DFNT_UINT32
Cardinality:	{ 4 }
Range:	0 – 813 (checked)
Values:	-
Units:	dimensionless
Used in:	Preparator
Variable Name:	electronic_region

4.5.30 LED Dead Pixel Identification Region

Description:	Applicable region on the CCD for dead pixel identification for LED measurements
Type:	DFNT_UINT32
Cardinality:	{ 4 }
Range:	0 – 813 (checked)
Values:	-
Units:	dimensionless
Used in:	Preparator
Variable Name:	LED_DPID_region

4.5.31 Left Excess Electronics Region

Description:	Definition of the electronics “Left Excess Pixels” region on the CCD. See also IMG Electronics Region in section 4.5.28.
Type:	DFNT_UINT32
Cardinality:	{ 4 }
Range:	0 – 813 (checked)
Values:	-
Units:	dimensionless
Used in:	Preparator
Variable Name:	electronic_region

4.5.32 LSA Electronics Region

Description:	Definition of the electronics “Lower Straylight Area” region on the CCD. See also IMG Electronics Region in section 4.5.28.
Type:	DFNT_UINT32
Cardinality:	{ 4 }
Range:	0 – 813 (checked)
Values:	-
Units:	dimensionless
Used in:	Preparator
Variable Name:	electronic_region

4.5.33 Non-linearity scaling factor in polynomials

Description:	Scaling factors for the non-linearity correction function.
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	>0 (checked)
Values:	Typical value = 1.0
Units:	dimensionless
Used in:	Non-linearity Correction
Variable Name:	$non_lin_scale_k$

4.5.34 Number Computation Elements Parallel

Description:	Number of multiplications involved in correcting one pixel for parallel transfer in CTE correction
Type:	DFNT_UINT32
Cardinality:	{ 1 }
Range:	0 – 577 (checked at >= 0)
Values:	Typical value = 3 to 5
Units:	dimensionless
Used in:	CTE correction
Variable Name:	$Number_computation_elements_parallel_k$

4.5.35 Number Computation Elements Serial

Description:	Number of multiplications involved in correcting one pixel for serial transfer in CTE correction
Type:	DFNT_UINT32
Cardinality:	{ 1 }
Range:	0 – 814 (checked at >= 0)
Values:	Typical value = 3 to 5
Units:	dimensionless
Used in:	CTE correction
Variable Name:	$Number_computation_elements_serial_k$

4.5.36 Offset Calculation Skip Pixels

Description:	Number of pixels skipped in offset calculation after each gain switch. Purpose of this setting is to exclude the pixels that are affected by gain overshoots, so that these do no affect the calculated offset values.
Type:	DFNT_UINT32
Cardinality:	{ 1 }
Range:	0 – 813 (checked at >= 0)
Values:	-
Units:	dimensionless
Used in:	Offset Calculation
Variable Name:	$offset_calc_skip_pixels_k$

4.5.37 Offset Delta Gain Dependent

Description:	Gain dependent difference between the offset values calculated from the read-out register pixels and the actual offset in the image
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	-
Values:	-
Units:	V
Used in:	Offset Calculation
Variable Name:	$c_{gain_dep,k}$

4.5.38 Offset Delta Gain Independent

Description:	Gain independent difference between the offset values calculated from the read-out register pixels and the actual offset in the image
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	-
Values:	-
Units:	V
Used in:	Offset Calculation
Variable Name:	$c_{gain_indep,k}$

4.5.39 Offset Delta Register

Description:	Register shape function for offset correction
Type:	DFNT_FLOAT32
Cardinality:	{ 814 }
Range:	-
Values:	-
Units:	V
Used in:	Offset Calculation
Variable Name:	$S_{ROR_shape}(i)_k$

4.5.40 Offset Value

Description:	Offset values for the different gain codes. By default, the GDPS will use dynamically determined offset values. When these cannot be calculated, the values in this dataset will be used as fallback. These coefficients are also used for determining if the dynamic offset values are in the expected range and flag them if this is not the case.
Type:	DFNT_FLOAT32
Cardinality:	{ 4 }
Range:	0 – 5 (checked at >=0)
Values:	One value per gain code; typical values ~0.54, ~1.66, ~0.12, ~0.21 for UV; ~0.46, ~1.30, ~0.12, ~0.20 for VIS.
Units:	V
Used in:	Offset flagging, Offset Correction
Variable Name:	$f_{k,g}$

4.5.41 Pixel Full Well

Description:	Pixel content for which pixel full well saturation will occur
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	>=0 (checked)
Values:	Typical value = ~4e5 e for UV and ~5e5 e for VIS; below the ellipsoid effect threshold
Units:	e
Used in:	Register & pixel saturation flagging
Variable Name:	$pixel_full_well_k$

4.5.42 Pixel Shift Time

Description:	Pixel shift time. Time to clock out a single pixel in the CCD.
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	>=0 (checked)
Values:	Typical value = 7.5e-6 s
Units:	s
Used in:	Calculation of Dark Current Correction coefficients, DEM Saturation Flagging
Variable Name:	t_pixel_k

4.5.43 Read-Out Noise

Description:	Read-out noise for every gain code
Type:	DFNT_FLOAT32
Cardinality:	{ 4 }
Range:	25 – 500 (checked at >=25)
Values:	One value per gain code
Units:	e
Used in:	Calculation of measurement noise
Variable Name:	$\sigma_{read\text{-}out,k,g}$

4.5.44 Register Full Well

Description:	Pixel content for which full well saturation will occur in the pixels of the read-out register.
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	1e6 – 5e6 (checked at >=1e6)
Values:	Typical value = ~2.5e6 e
Units:	e
Used in:	Register & pixel saturation flagging
Variable Name:	$register_full_well_k$

4.5.45 Response Function Parallel

Description:	Response functions for every CCD row for parallel transfer
Type:	DFNT_FLOAT32
Cardinality:	{577, UNDEF}
Range:	0.0 – 1.0
Values:	-
Units:	dimensionless
Used in:	CTE correction
Variable Name:	$Response_parallel(jj,n_{par})_k$

4.5.46 Response Function Serial

Description:	Response functions for every CCD column for serial transfer
Type:	DFNT_FLOAT32
Cardinality:	{814, UNDEF}
Range:	0.0 – 1.0
Values:	-
Units:	dimensionless
Used in:	CTE correction
Variable Name:	$Response_serial(ii,n_{ser})_k$

4.5.47 Right Excess Electronics Region

Description:	Definition of the electronics “Right Excess Pixels” region on the CCD. See also IMG Electronics Region in section 4.5.28.
Type:	DFNT_UINT32
Cardinality:	{ 4 }
Range:	0 – 813 (checked)
Values:	-
Units:	dimensionless
Used in:	Preparator
Variable Name:	electronic_region

4.5.48 ROR Electronics Region

Description:	Definition of the electronics “Read-out Register” region on the CCD. See also IMG Electronics Region in section 4.5.28.
Type:	DFNT_UINT32
Cardinality:	{ 4 }
Range:	0 – 813 (checked)
Values:	-
Units:	dimensionless
Used in:	Preparator
Variable Name:	electronic_region

4.5.49 Row Shift Time

Description:	Row shift time Time to shift / bin a single row from the CCD storage section to the read-out register of the CCD
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	>=0 (checked)
Values:	Typical value = 7.5e-6 s
Units:	s
Used in:	Calculation of Dark Current Correction coefficients Calculation of Exposure smear correction coefficients
Variable Name:	$t_{rowtransfer}$

4.5.50 Threshold indicator non-linearity start

Description:	Threshold that will be used to determine if a pixel shall be flagged for having a pixel filling that is in the non-linear range of the output amplifier on the CCD.
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	-
Values:	Typical value = 2.0e5 e
Units:	E
Used in:	Non-linearity Correction
Variable Name:	$non_lin_threshold_k$

4.5.51 Transient Split Column

Description:	Split Column for Transient Pixel Flagging. Separates transient regions uv1/uv2.
Type:	DFNT_UINT32
Cardinality:	{ 1 }
Range:	0 – 813 (checked)
Values:	Typical value = 615
Units:	dimensionless
Used in:	Transient Pixel Flagging
Variable Name:	transient_split_col

4.5.52 UDA Electronics Region

Description:	Definition of the electronics “Upper Dark Area” region on the CCD. See also IMG Electronics Region in section 4.5.28.
Type:	DFNT_UINT32
Cardinality:	{ 4 }
Range:	0 – 813 (checked)
Values:	-
Units:	dimensionless
Used in:	Preparator
Variable Name:	electronic_region

4.5.53 USA Electronics Region

Description:	Definition of the electronics “Upper Straylight Area” region on the CCD. See also IMG Electronics Region in section 4.5.28.
Type:	DFNT_UINT32
Cardinality:	{ 4 }
Range:	0 – 813 (checked)
Values:	
Units:	dimensionless
Used in:	Preparator
Variable Name:	electronic_region

4.5.54 UV VIS Small Pixel Column Signal Conversion

Description:	Conversion coefficients to convert small pixel signals from UV to VIS and vice versa.
Type:	DFNT_FLOAT32
Cardinality:	{ 2 }
Range:	
Values:	0.0, 1.335
Units:	dimensionless
Used in:	Calculation of spectral calibration coefficients
Variable Name:	a_0, a_1

4.6 Group UV/General/Limit settings

4.6.1 ADC Saturation Value

Description:	ADC value for above which saturation of the ADC occurs
Type:	DFNT_UINT32
Cardinality:	{ 1 }
Range:	0 – 4095 (checked at >= 0)
Values:	Typical value = 4094 ADU
Units:	ADU
Used in:	Saturated ADC pixel flagging
Variable Name:	$ADC_saturation_value_k$

4.6.2 Dark Current Flagging Limit

Description:	Dark current flagging limit
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	0.0 – 10.0 (checked at >= 0)
Values:	-
Units:	dimensionless
Used in:	Dark current flagging
Variable Name:	$dark_current_flagging_limit_k$

4.6.3 DARK Dead Pixel Lower Limit

Description:	Lower limit for identification of dead pixels in dark measurements
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	0.0 – 1.0 (checked at >= 0)
Values:	-
Units:	dimensionless
Used in:	Dead pixel identification for WLS and DARK measurements
Variable Name:	$Dark_dead_pixel_llimit_k$

4.6.4 DARK Dead Pixel Upper Limit

Description:	Upper limit for identification of dead pixels in dark measurements
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	1.0 – 50.0 (checked at >= 1)
Values:	-
Units:	dimensionless
Used in:	Dead pixel identification for WLS and DARK measurements
Variable Name:	$Dark_dead_pixel_ulimit_k$

4.6.5 DEM Slope Max

Description:	DEM Slope Error Maximum. Upper limit relative slope in voltage charge
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	0 – 1 (checked at >0)
Values:	-
Units:	dimensionless
Used in:	DEM Saturation Flagging
Variable Name:	$\varepsilon_DEM_slope_max_k$

4.6.6 Exposure Smear Limit

Description:	Exposure Smear Limit
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	-
Values:	-
Units:	dimensionless
Used in:	Exposure smear flagging
Variable Name:	$Exposure_smear_limit_k$

4.6.7 Exposure Smear SN Limit

Description:	Threshold for signal noise to condition choice for alternatives for calculation of smear correction coefficients
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	-
Values:	-
Units:	dimensionless
Used in:	Calculation of Exposure smear correction coefficients
Variable Name:	$Smear_SN_limit_k$

4.6.8 LED Dead Pixel Lower Limit

Description:	Lower limit for identification of dead pixels in LED measurements
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	0.0 – 1.0 (checked at >= 0)
Values:	-
Units:	dimensionless
Used in:	Dead pixel identification for LED measurements
Variable Name:	$LED_dead_pixel_llimit_k$

4.6.9 LED Dead Pixel Upper Limit

Description:	Lower limit for identification of dead pixels in LED measurements
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	1.0 – 50.0 (checked at >= 1)
Values:	-
Units:	dimensionless
Used in:	Dead pixel identification for LED measurements
Variable Name:	$LED_dead_pixel_ulimit_k$

4.6.10 Lower Offset Limit

Description:	Lower limit for flagging offset values
Type:	DFNT_FLOAT32
Cardinality:	{ 4 }
Range:	>= 0 (checked)
Values:	1 limit value for each gain code
Units:	dimensionless
Used in:	Offset Flagging
Variable Name:	$offset_lower_limit_{k,g}$

4.6.11 Pixel Full Well Limit

Description:	Fraction of the pixel full well that sets the limit for flagging
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	>= 0 (checked)
Values:	Typical Value = 0.95
Units:	dimensionless
Used in:	Register & pixel saturation flagging
Variable Name:	$pixel_full_well_limit_k$

4.6.12 Register Full Well Limit

Description:	Fraction of the register full well that sets the limit for flagging
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	>= 0 (checked)
Values:	Typical value = 0.95
Units:	dimensionless
Used in:	Register & pixel saturation flagging
Variable Name:	$register_full_well_limit_k$

4.6.13 U DEM Limit

Description:	DEM Output Saturation Limit. Upper limit for Voltage Charge received from DEM
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	-10 – 50
Values:	-
Units:	V
Used in:	DEM Saturation Flagging
Variable Name:	$U_DEM_limit_max_k$

4.6.14 Upper Offset Limit

Description:	Upper limit for flagging offset values
Type:	DFNT_FLOAT32
Cardinality:	{ 4 }
Range:	>= 0 (checked)
Values:	1 limit value for each gain code
Units:	dimensionless
Used in:	Offset Flagging
Variable Name:	$offset_upper_limit_{k,g}$

4.6.15 WLS Dead Pixel Lower Limit

Description:	Lower limit for identification of dead pixels in WLS measurements
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	0.0 – 1.0 (checked at >= 0)
Values:	-
Units:	dimensionless
Used in:	Dead pixel identification for WLS and DARK measurements
Variable Name:	$WLS_dead_pixel_llimit_k$

4.6.16 WLS Dead Pixel Upper Limit

Description:	Upper limit for identification of dead pixels in WLS measurements
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	1.0 – 50.0 (checked at >= 1)
Values:	-
Units:	dimensionless
Used in:	Dead pixel identification for WLS and DARK measurements
Variable Name:	$WLS_dead_pixel_ulimit_k$

4.7 Group UV/UV2/Image data

4.7.1 Irradiance Sensitivity Function Backup Diffusor

Description:	Irradiance Sensitivity Function on CCD for the Backup Diffuser N.B. The wavelength assignment for the irradiance sensitivity function is specified by Irradiance Sensitivity Spectral Calibration Coefficients (section 4.7.5) and Irradiance Sensitivity Reference Column (section 4.7.4).
Type:	DFNT_FLOAT32
Cardinality:	{577, 814}
Range:	1e12 – 1e15
Values:	-
Units:	p/(cm^2.nm)/e
Used in:	Calculation of Irradiance sensitivity correction coefficients
Variable Name:	$IRRAD_{OPF}(ii,jj)_{m,s}$

4.7.2 Irradiance Sensitivity Function Regular Diffusor

Description:	Irradiance Sensitivity Function on CCD for the Regular Diffuser N.B. The wavelength assignment for the irradiance sensitivity function is specified by Irradiance Sensitivity Spectral Calibration Coefficients (section 4.7.5) and Irradiance Sensitivity Reference Column (section 4.7.4).
Type:	DFNT_FLOAT32
Cardinality:	{577, 814}
Range:	1e12 – 1e15
Values:	-
Units:	p/(cm^2.nm)/e
Used in:	Calculation of Irradiance sensitivity correction coefficients
Variable Name:	$IRRAD_{OPF}(ii,jj)_{m,s}$

4.7.3 Irradiance Sensitivity Function Volume Diffusor

Description:	Irradiance Sensitivity Function on CCD for Volume Diffusor N.B. The wavelength assignment for the irradiance sensitivity function is specified by Irradiance Sensitivity Spectral Calibration Coefficients (section 4.7.5) and Irradiance Sensitivity Reference Column (section 4.7.4).
Type:	DFNT_FLOAT32
Cardinality:	{577, 814}
Range:	1e12 – 1e15
Values:	-
Units:	p/(cm^2.nm)/e
Used in:	Calculation of Irradiance sensitivity correction coefficients
Variable Name:	$IRRAD_{OPF}(ii,jj)_{m,s}$

4.7.4 Irradiance Sensitivity Reference Column

Description:	Reference column for the wavelength polynomial coefficients (Irradiance Sensitivity Spectral Calibration Coefficients in section 4.7.5) associated with the Irradiance sensitivity function (Irradiance Sensitivity Function Backup Diffusor in section 4.7.1, Irradiance Sensitivity Function Regular Diffusor in section 4.7.2 and Irradiance Sensitivity Function Volume Diffusor in section 4.7.3)
Type:	DFNT_UINT32
Cardinality:	{ 1 }
Range:	0 – 813 (checked)
Values:	Typical value around the middle column of the sub-channel
Units:	dimensionless
Used in:	Calculation of Irradiance sensitivity correction coefficients
Variable Name:	$ii_IRRAD_{ref,k,m}$

4.7.5 Irradiance Sensitivity Spectral Calibration Coefficients

Description:	Wavelength polynomial coefficients associated with the Irradiance sensitivity function (Irradiance Sensitivity Function Backup Diffusor in section 4.7.1, Irradiance Sensitivity Function Regular Diffusor in section 4.7.2 and Irradiance Sensitivity Function Volume Diffusor in section 4.7.3) for each row of CCD.
Type:	DFNT_FLOAT32
Cardinality:	{ 577, UNDEF }
Range:	-
Values:	The polynomial coefficients s are along the columns (fastest iterating dimension) of the dataset. Each row (slowest iterating dimension) in the dataset corresponds to the same row in the CCD.
Units:	$nm/pixel^n$
Used in:	Calculation of Irradiance sensitivity correction coefficients
Variable Name:	$c_\lambda_{IRRAD}(jj)_{m,n}$

4.7.6 Pixel LOS Azimuth

Description:	Pixel Line Of Sight in the azimuth direction (swath direction) in the spacecraft reference frame.
Type:	DFNT_FLOAT32
Cardinality:	{ 577, 814 }
Range:	-60.0 – 60.0
Values:	Positive in west direction when passing ascending node
Units:	degrees
Used in:	Calculation of Geolocation Line-of-Sight angles
Variable Name:	$PLOS_azimuth(ii,jj)_m$

4.7.7 Pixel LOS Elevation

Description:	Pixel Line Of Sight in the elevation direction (flight direction) in the spacecraft reference frame.
Type:	DFNT_FLOAT32
Cardinality:	{ 577, 814 }
Range:	-4.0 – 1.0
Values:	Positive in flight direction
Units:	degrees
Used in:	Calculation of Geolocation Line-of-Sight angles
Variable Name:	$PLOS_elevation(ii,jj)_m$

4.7.8 Radiance Sensitivity Function

Description:	Radiance Sensitivity function N.B. The wavelength assignment for the radiance sensitivity function is specified by Radiance Sensitivity Spectral Calibration Coefficients (section 4.7.10) and Radiance Sensitivity Reference Column (section 4.7.9).
Type:	DFNT_FLOAT32
Cardinality:	{577, 814}
Range:	1e6 – 1e10
Values:	Typical values = ~1.0e8
Units:	$p/(cm^2.nm.sr)/e$
Used in:	Calculation of Radiance sensitivity correction coefficients
Variable Name:	$H_{OPF}(ii,jj)_{k,m}$

4.7.9 Radiance Sensitivity Reference Column

Description:	Reference column for the wavelength polynomial coefficients (Radiance Sensitivity Spectral Calibration Coefficients in section 4.7.10) associated with the Radiance Sensitivity Function (section 4.7.8).
Type:	DFNT_UINT32
Cardinality:	{ 1 }
Range:	0 – 813 (checked)
Values:	Typical value around the middle column of the sub-channel
Units:	dimensionless
Used in:	Calculation of Radiance sensitivity correction coefficients
Variable Name:	$ii_H_{ref,k,m}$

4.7.10 Radiance Sensitivity Spectral Calibration Coefficients

Description:	Wavelength polynomial coefficients associated with the Radiance Sensitivity Function (section 4.7.8) for each row of CCD
Type:	DFNT_FLOAT32
Cardinality:	{ 577, UNDEF }
Range:	-
Values:	The polynomial coefficients s are along the columns (fastest iterating dimension) of the dataset. Each row (slowest iterating dimension) in the dataset corresponds to the same row in the CCD.
Units:	$nm/pixel^n$
Used in:	Calculation of Radiance sensitivity correction coefficients
Variable Name:	$c_\lambda_H(jj)_{m,n}$

4.7.11 Slit Irregularity Function

Description:	Slit Irregularity Function for each row in the CCD
Type:	DFNT_FLOAT32
Cardinality:	{ 577}
Range:	-0.01 – 0.01
Values:	-
Units:	dimensionless
Used in:	Slit irregularity correction
Variable Name:	$Slit_irreg(jj)_{k,m}$

4.8 Group UV/UV2/Instrument parameters

4.8.1 Delta Irradiance Sensitivity Row Translation Table

Description:	Table that couples a CCD row index to an index of a row set. The possibility of having on each row set a different set of polynomial coefficients in T_0 , T_1 and T_2 hereby introduces a row dependency of the delta irradiance coefficients.
Type:	DFNT_UINT32
Cardinality:	{ 577 }
Range:	-1 – 577
Values:	A typical value should be a valid row index for the c_{dIRRAD} tables: $0 \leq \ldots \leq N_{rowset}-1$ Special value -1 stands for a CCD row that is not mapped to any row set
Units:	dimensionless
Used in:	Calculation of Delta Irradiance correction coefficients
Variable Name:	$j_{map}(jj)$

4.8.2 Irradiance Sensitivity Function high row (obsolete)

4.8.3 Irradiance Sensitivity Function low row (obsolete)

4.8.4 LSA_CAL_EARTH

Description:	Weight factor of lower straylight area
Type:	DFNT_FLT32
Cardinality:	{ 814 }
Range:	0 – 100
Values:	Array containing weight factors of lower straylight area in straylight correction, as applied to measurement of type EARTH, and for every column i in optics region.
Units:	dimensionless
Used in:	Calculation of Stray light correction coefficients
Variable Name:	LSA_CAL_EARTH(i)

4.8.5 LSA_CAL_SUN

Description:	Weight factor of lower straylight area
Type:	DFNT_FLT32
Cardinality:	{ 814 }
Range:	0 – 100
Values:	Array containing weight factors of lower straylight area in straylight correction, as applied to measurement of type SUN, and for every column i in optics region.
Units:	dimensionless
Used in:	Calculation of Stray light correction coefficients
Variable Name:	LSA_CAL_SUN(i)

4.8.6 LSA_CAL_WLS

Description:	Weight factor of lower straylight area
Type:	DFNT_FLT32
Cardinality:	{ 814 }
Range:	0 – 100
Values:	Array containing weight factors of lower straylight area in straylight correction, as applied to measurement of type WLS, and for every column i in optics region.
Units:	dimensionless
Used in:	Calculation of Stray light correction coefficients
Variable Name:	LSA_CAL_WLS(i)

4.8.7 Optics Region

Description:	Definition of the “optics” region on the CCD. This region is the area on the CCD that is illuminated by the spectrometer for Earth, Sun and WLS measurement. This definition is used for all types of measurements, i.e. the nominal “binned” measurements as well as the “unbinned” measurements.
Type:	DFNT_UINT32
Cardinality:	{ 4 }
Range:	0 – 813 (checked)
Values:	-

Units:	dimensionless
Used in:	Preparator
Variable Name:	Optics_region

4.8.8 Straylight calculation weighing factor

Description:	Weighing factor for subtraction of the stray-light that is calculated from the signals in the upper and lower stray-light areas, for non-UV1 and/or no spatial zoom-in
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	0.0 – 1.0 (checked)
Values:	-
Units:	dimensionless
Used in:	Calculation of Stray light correction coefficients
Variable Name:	$f_{msmt_stray_weight,m}$

4.8.9 Straylight calculation weighing factor zoom UV1

Description:	Weighing factor for subtraction of the stray-light that is calculated from the signals in the upper and lower stray-light areas, for spatial zoom-in on UV1 sub-channel
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	0.0 – 1.0 (checked)
Values:	-
Units:	dimensionless
Used in:	Calculation of Stray light correction coefficients
Variable Name:	$f_{msmt_stray_weight_UV1}$

4.8.10 Straylight Flagging Region

Description:	Stray-light flagging regions Contains a number of regions on which the stray-light flagging algorithm is applied. In the stray-light flagging algorithm each regions is evaluated independently. A different flagging limit can be specified for each of the regions by means of the Straylight Limit (section 4.9.6).
Type:	DFNT_UINT32
Cardinality:	{ UNDEF, 4 }
Range:	0 – 813 (checked)
Values:	Each row (slowest iterating dimension) contains a set of 4 values specifying the extent of a flagging region. The number of rows must be equal to the number of elements in Straylight Limit (section 4.9.6).
Units:	dimensionless
Used in:	Preparator, Straylight flagging
Variable Name:	$first_col_{m,n}$ $last_col_{m,n}$ $first_row_{m,n}$ $last_row_{m,n}$

4.8.11 Straylight Use Stray Areas Flag

Description:	Flag to indicate whether stray-light that is calculated directly from the upper and lower stray-lights areas should be taken into account in the Calculation of Stray light correction coefficients algorithm.
Type:	DFNT_UINT32
Cardinality:	{ 1 }
Range:	0 – 1 (checked)
Values:	1 = Use Straylight regions; 0 = Do not use Straylight regions
Units:	dimensionless
Used in:	Calculation of Stray light correction coefficients
Variable Name:	$msmt_stray_flag_m$

4.8.12 USA_CAL_EARTH

Description:	Weight factor of upper straylight area
Type:	DFNT_FLT32
Cardinality:	{ 814 }
Range:	0 – 100
Values:	Array containing weight factors of upper straylight area in straylight correction, as applied to measurement of type EARTH, and for every column i in optics region.
Units:	dimensionless
Used in:	Calculation of Stray light correction coefficients
Variable Name:	USA_CAL_EARTH(i)

4.8.13 USA_CAL_SUN

Description:	Weight factor of upper straylight area
Type:	DFNT_FLT32
Cardinality:	{ 814 }
Range:	0 – 100
Values:	Array containing weight factors of upper straylight area in straylight correction, as applied to measurement of type SUN, and for every column i in optics region.
Units:	dimensionless
Used in:	Calculation of Stray light correction coefficients
Variable Name:	USA_CAL_SUN(i)

4.8.14 USA_CAL_WLS

Description:	Weight factor of upper straylight area
Type:	DFNT_FLT32
Cardinality:	{ 814 }
Range:	0 – 100
Values:	Array containing weight factors of upper straylight area in straylight correction, as applied to measurement of type WLS, and for every column i in optics region.
Units:	dimensionless
Used in:	Calculation of Stray light correction coefficients
Variable Name:	USA_CAL_WLS(i)

4.8.15 UV2_LSA_bot_row

Description:	Bottom row (CCD) of lower straylight area - may be different from electronic USA.
Type:	DFNT_UINT32
Cardinality:	{ 1 }
Range:	0 – 576 (checked)
Values:	typical = 121
Units:	dimensionless
Used in:	Calculation of Stray light correction coefficients
Variable Name:	$f'_{i,k}$(LSA_BOT_ROW)

4.8.16 UV2_LSA_top_row

Description:	Top row (CCD) of lower straylight area - may be different from electronic USA.
Type:	DFNT_UINT32
Cardinality:	{ 1 }
Range:	0 – 576 (checked)
Values:	typical = 152
Units:	dimensionless
Used in:	Calculation of Stray light correction coefficients
Variable Name:	$f'_{i,k}$(LSA_TOP_ROW)

4.8.17 UV2_USA_bot_row

Description:	Bottom row (CCD) of upper straylight area - may be different from electronic USA.
Type:	DFNT_UINT32
Cardinality:	{ 1 }
Range:	0 – 576 (checked)
Values:	typical = 425
Units:	dimensionless
Used in:	Calculation of Stray light correction coefficients
Variable Name:	$f'_{i,k}$(USA_BOT_ROW)

4.8.18 UV2_USA_top_row

Description:	Top row (CCD) of upper straylight area - may be different from electronic USA.
Type:	DFNT_UINT32
Cardinality:	{ 1 }
Range:	0 – 576 (checked)
Values:	typical = 456
Units:	dimensionless
Used in:	Calculation of Stray light correction coefficients
Variable Name:	$f'_{i,k}$(USA_TOP_ROW)

4.9 Group UV/UV2/Limit settings

4.9.1 Diffuser Feature Averaging Neighbours

Description:	Number of (binned) neighbouring rows above and below each row to include in box car smoothing for diffuser features.
Type:	DFNT_UINT32
Cardinality:	{ 2 }
Range:	0 – 577 (checked)
Values:	The first element specifies the number of rows for measurements with binning factor 8, the second element specifies the number of rows for measurements with binning factor 4.
Units:	dimensionless
Used in:	Irradiance Averaging
Variable Name:	DIFF_feature_nrpix_avg$_{k,m}$(n)

4.9.2 Noise Limit Factor (obsolete)

4.9.3 Specres Limit Factor (obsolete)

4.9.4 Spectral Calibration Chi Squared Flagging Limit

Description:	Spectral Calibration Chi Squared Flagging Limit Limit that specifies when the quality of the non-linear fit in the spectral calibration algorithm is too bad and the result should be excluded from further processing steps in the spectral calibration algorithm.
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	-
Values:	-
Units:	dimensionless
Used in:	Spectral Calibration
Variable Name:	Spectral_chi_limit$_{k,m}$

4.9.5 Spectral Calibration Flagging Limit

Description:	Spectral Calibration Flagging Limit for flagging coefficients from the spectral calibration algorithm that deviate more than expected from the OPF spectral calibration coefficients.
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	>= 0 (checked)
Values:	-
Units:	dimensionless
Used in:	Spectral calibration coefficients flagging
Variable Name:	Spectral_flagging_limit$_{k,m}$

4.9.6 Straylight Limit

Description:	Stray-light Limit
Type:	DFNT_FLOAT32
Cardinality:	{ UNDEF }
Range:	-
Values:	A limit must be specified for each stray-light flagging region specified by Straylight Flagging Region (section 4.8.10).
Units:	dimensionless
Used in:	Stray light flagging
Variable Name:	$\text{straylight_limit}_{k,m,n}$

4.9.7 Sun Glint Threshold

Description:	Threshold for setting the sun-glint possibility flag
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	0 – 180
Values:	Typical value = 30 degrees
Units:	degrees
Used in:	Geo-location
Variable Name:	$\text{sun_glint_possibility_threshold}_{k,m}$

4.9.8 Transient Threshold CAL

Description:	Three spike level thresholds for non-radiance measurements
Type:	DFNT_FLOAT32
Cardinality:	{ UNDEF, 3 }
Range:	0 – 100
Values:	Per row (=config ID+vs pair) three spike thresholds: one for NN smoothing method (dir. combined) and two for SD method (column/row direction separate). A triple corresponds to max. tolerances for all possible methods/directions, that are set for config ID+vs pair w, channel k, as restricted to transient region m.
Units:	dimensionless
Used in:	Transient Pixel Flagging
Variable Name:	$\{\text{opf_threshold, opf_spike_threshold_col, opf_spike_threshold_row}\}_{k,m,w}$

4.9.9 Transient Threshold RAD

Description:	Two spike level and one signal-to-noise threshold for radiance measurements
Type:	DFNT_FLOAT32
Cardinality:	{ 3 }
Range:	0 – 100
Values:	Spike tolerances for column and row direction when using SD smoothing method; furthermore min. tolerance for signal-to-noise ratio. A triple corresponds to limits for both directions + SNR tolerance; per channel k, and per transient region m.
Units:	dimensionless
Used in:	Transient Pixel Flagging
Variable Name:	$\{\text{opf_spike_threshold_col, opf_spike_threshold_row, opf_snr_threshold}\}_{k,m}$

4.9.10 Transient Width CAL

Description:	Four median filter widths for non-radiance measurements
Type:	DFNT_INT32
Cardinality:	{ UNDEF, 6 }
Range:	-1 – 814
Values:	Per row: configuration ID + version pair (=w; used for lookup across table rows), followed by 2 column/row pairs of median widths: for NN and for SD method. Table asa whole per channel k and transient region m, table row per config pair w
Units:	dimensionless
Used in:	Transient Pixel Flagging
Variable Name:	$\{opf_width_col, opf_width_row, opf_median_width_col, opf_median_width_row\}_{k,m,w}$

4.9.11 Transient Width RAD

Description:	Two median filter widths for radiance measurements
Type:	DFNT_INT32
Cardinality:	{ 2 }
Range:	-1 – 814
Values:	Median widths for SD method; column and row direction, per channel k and per transient region m
Units:	dimensionless
Used in:	Transient Pixel Flagging
Variable Name:	$\{opf_median_width_col, opf_median_width_row\}_{k,m}$

4.9.12 Wavelength Range

Description:	Wavelength range for the sub-channel. Specifies the wavelength range for which the data in the sub-channel is valid and can be taken into account for stray-light calculation.
Type:	DFNT_FLOAT32
Cardinality:	{ 2 }
Range:	0 – 1000 (checked)
Values:	First value specifies the minimum wavelength, the second element specifies the maximum wavelength.
Units:	nm
Used in:	Calculation of Stray light correction coefficients
Variable Name:	$\lambda_{range}(v)_m$

4.9.13 XTrack Quality Flagging Parameters

Description:	Flagging rules for XTrack Quality Flagging. A flagging rule consists of a set of boundaries and a set of values that determine the initial value of the XTrackQualityFlags data field for ground pixels that obey those boundaries.	
Type:	DFNT_INT32	
Cardinality:	{ 8, UNDEF }	
Range:	0 – 99999 (checked)	
Values:	0, 1	Start orbit, end orbit. These make up an orbit number range (inclusive).
	2, 3	Start orbit phase, end orbit phase (in thousandths). These make up an orbit phase range.
	4, 5	Start row, end row. These make up a row range (inclusive). Note that these are unbinned rows.
	6	Initial XTrackQualityFlags value for bits 0-2. In the future, the GDPS should be able to update this value depending on the outcome of a row anomaly correction algorithm.
	7	XTrackQualityFlags value for bits 4-7. Values will typically be 16, 32, 64, or 128 (i.e., “affected by the [wavelength-shift | blockage | stray sunlight | stray earthshine] effect”), but it is also possible to roll multiple effects into one flagging rule.
Units:	-	
Used in:	XTrack Quality Flagging	
Variable Name:	flng_params	

4.10 Group UV/UV2/Spectral Calibration data

4.10.1 Ozone Spectrum

Description:	Set of Ozone absorption cross section reference spectra convoluted with the OMI slit function. This reference spectrum is used in the Spectral Calibration algorithm Since the slit function varies by for the rows in the CCD and also varies for the different sub-channels UV1, UV2 and VIS, it is possible to supply a set of spectra for each sub-channel. Based on the settings for the spectral calibration algorithm, the spectra can be linked to different (sets of) rows in the CCD.
Type:	DFNT_FLOAT32
Cardinality:	{ UNDEF, UNDEF }
Range:	-
Values:	The first column in this dataset contains wavelengths (Typical spacing = 0.1 nm). Remaining columns contain the corresponding spectrum intensities.
Units:	nm for first column, cm^2 / molecule for remaining columns
Used in:	Spectral Calibration
Variable Name:	$\sigma_{ozone}(\lambda)_{k,m,n}$

4.10.2 Ring Direct Spectrum

Description:	Set of Ring spectra convoluted with the OMI slit function. This reference spectrum is used in the Direct Fit method of the Spectral Calibration algorithm Since the slit function varies by for the rows in the CCD and also varies for the different sub-channels UV1, UV2 and VIS, it is possible to supply a set of spectra for each sub-channel. Based on the settings for the spectral calibration algorithm, the spectra can be linked to different (sets of) rows in the CCD.
Type:	DFNT_FLOAT32
Cardinality:	{ UNDEF, UNDEF }
Range:	-
Values:	The first column in this dataset contains wavelengths (Typical spacing = 0.01 nm). Remaining columns contain the corresponding spectrum intensities.
Units:	nm for first column, dimensionless for remaining columns
Used in:	Spectral Calibration
Variable Name:	$Ring_{direct}(\lambda)_{k,m,n}$

4.10.3 Ring DOAS Spectrum

Description:	Set of Ring spectra convoluted with the OMI slit function. This reference spectrum is used in the DOAS Fit method of the Spectral Calibration algorithm Since the slit function varies by for the rows in the CCD and also varies for the different sub-channels UV1, UV2 and VIS, it is possible to supply a set of spectra for each sub-channel. Based on the settings for the spectral calibration algorithm, the spectra can be linked to different (sets of) rows in the CCD.
Type:	DFNT_FLOAT32
Cardinality:	{ UNDEF, UNDEF }
Range:	-
Values:	The first column in this dataset contains wavelengths (Typical spacing = 0.01 nm). Remaining columns contain the corresponding spectrum intensities.
Units:	nm for first column, dimensionless for remaining columns
Used in:	Spectral Calibration
Variable Name:	$Ring_{DOAS}(\lambda)_{k,m,n}$

4.10.4 Slit Illumination Correction Coefficients

Description:	Inhomogeneous slit illumination correction coefficient for each row within each sub-channel. These coefficients are used to correct the Spectral Calibration Coefficients (section 4.10.6) for wavelength shifts due to inhomogeneous slit illumination.
Type:	DFNT_FLOAT32
Cardinality:	{ 577, UNDEF }
Range:	>= 0 (checked)
Values:	The rows (slowest iterating dimension) in this dataset correspond to rows in the CCD. The columns (fastest iterating dimension) in this dataset correspond to the wavelength polynomial coefficients. The dimensions of this dataset must match the datasets Spectral Calibration Coefficient Errors (4.10.5),Spectral Calibration Coefficients (section 4.10.6), Spectral Calibration Coefficients D (4.10.7) and Spectral Calibration Coefficients E (section 4.10.8).
Units:	$nm/pixel^n$
Used in:	Calculation of Spectral calibration coefficients
Variable Name:	$b_OPF_n(jj)_{k,m}$

4.10.5 Spectral Calibration Coefficient Errors

Description:	Statistical error on the Spectral Calibration Coefficients (section 4.10.6) for each row within each sub-channel
Type:	DFNT_FLOAT32
Cardinality:	{ 577, UNDEF }
Range:	>= 0 (checked)
Values:	The rows (slowest iterating dimension) in this dataset correspond to rows in the CCD. The columns (fastest iterating dimension) in this dataset correspond to the wavelength polynomial coefficients. The dimensions of this dataset must match the datasets Slit Illumination Correction Coefficients (section 4.10.4), Spectral Calibration Coefficients (section 4.10.6), Spectral Calibration Coefficients D (4.10.7) and Spectral Calibration Coefficients E (section 4.10.8).
Units:	$nm/pixel^n$
Used in:	Calculation of Spectral calibration coefficients
Variable Name:	$\sigma_c_OPF_n(jj)_{k,m}$

4.10.6 Spectral Calibration Coefficients

Description:	Wavelength polynomial coefficients that specify the wavelength assignment for each row in the sub-channel to be used for the level 1b data products (Earth radiance & Solar Irradiance).
Type:	DFNT_FLOAT32
Cardinality:	{ 577, UNDEF }
Range:	-
Values:	The rows (slowest iterating dimension) in this dataset correspond to rows in the CCD. The columns (fastest iterating dimension) in this dataset correspond to the wavelength polynomial coefficients. The dimensions of this dataset must match the datasets Slit Illumination Correction Coefficients (section 4.10.4), Spectral Calibration Coefficient Errors (4.10.5), Spectral Calibration Coefficients D (4.10.7), and Spectral Calibration Coefficients E (section 4.10.8).
Units:	nm/pixel^n
Used in:	Calculation of Spectral calibration coefficients
Variable Name:	$c_OPF_n(jj)_{k,m}$

4.10.7 Spectral Calibration Coefficients D

Description:	Wavelength polynomial coefficients that specify the temperature dependence of the wavelength assignment for each row in the sub-channel to be used for the level 1b data products (Earth radiance & Solar Irradiance).
Type:	DFNT_FLOAT32
Cardinality:	{ 577, UNDEF }
Range:	-
Values:	The rows (slowest iterating dimension) in this dataset correspond to rows in the CCD. The columns (fastest iterating dimension) in this dataset correspond to the wavelength polynomial coefficients. The dimensions of this dataset must match the datasets Slit Illumination Correction Coefficients (section 4.10.4), Spectral Calibration Coefficient Errors (4.10.5), Spectral Calibration Coefficients (section 4.10.6), and Spectral Calibration Coefficients E (section 4.10.8).
Units:	nm/ K.pixel^n
Used in:	Calculation of Spectral calibration coefficients
Variable Name:	$d_OPF_n(jj)_{k,m}$

4.10.8 Spectral Calibration Coefficients E

Description:	Wavelength polynomial coefficients that specify the temperature dependence of the wavelength assignment for each row in the sub-channel to be used for the level 1b data products (Earth radiance & Solar Irradiance).
Type:	DFNT_FLOAT32
Cardinality:	{ 577, UNDEF }
Range:	-
Values:	The rows (slowest iterating dimension) in this dataset correspond to rows in the CCD. The columns (fastest iterating dimension) in this dataset correspond to the wavelength polynomial coefficients. The dimensions of this dataset must match the datasets Slit Illumination Correction Coefficients (section 4.10.4), Spectral Calibration Coefficient Errors (4.10.5), Spectral Calibration Coefficients (section 4.10.6), and Spectral Calibration Coefficients D (4.10.7)
Units:	$nm^2/ K^2.pixel^n$
Used in:	Calculation of Spectral calibration coefficients
Variable Name:	$e_OPF_n(jj)_{k,m}$

4.10.9 Spectral Calibration Coefficients Reference Temperature

Description:	Reference temperature for the temperature dependence of the wavelength polynomial coefficients that specify the temperature dependence of the wavelength assignment for each row in the sub-channel to be used for the level 1b data products (Earth radiance & Solar Irradiance).
Type:	DFNT_FLOAT32
Cardinality:	{ 1 }
Range:	260K – 300K
Values:	Typical value ~265K
Units:	K
Used in:	Calculation of Spectral calibration coefficients
Variable Name:	T_{sc_ref}

4.10.10 Spectral Calibration Fit Parameters

Description:	Start values for semi-linear fit parameters in the spectral calibration algorithm. For details see also [AD_04].
Type:	DFNT_FLOAT32
Cardinality:	{ UNDEF, 8 }
Range:	-
Values:	The rows (slowest iterating dimension) in this dataset correspond to the spectral calibration “windows”. The columns (fastest iterating dimension) in this dataset correspond to the individual non-linear fit parameters.
Units:	dimensionless
Used in:	Spectral Calibration
Variable Name:	$window_parameters(n,w)_m$

4.10.11 Spectral Calibration NFit Parameters

Description:	Flags to indicate if the parameters for the semi-linear fit are fixed or should be subject of the fit. For details see also [AD_04].
Type:	DFNT_UINT32
Cardinality:	{ UNDEF, 8 }
Range:	0 – 1 (checked)
Values:	0 for setting a parameter to a fixed value for the semi-linear fit; 1 for including a parameter in the semi-linear fit. The rows (slowest iterating dimension) in this dataset correspond to the spectral calibration “windows”. The columns (fastest iterating dimension) in this dataset correspond to the individual non-linear fit parameters. The number of rows in this dataset must be equal to the number of rows in Spectral Calibration Fit Parameters (section 4.10.10).
Units:	dimensionless
Used in:	Spectral Calibration
Variable Name:	$window_parm_fit_flag(n,w)_m$

4.10.12 Spectral Calibration Reference Column

Description:	Reference column for calculating the wavelength grid from the Spectral Calibration Coefficients (section 4.10.6)
Type:	DFNT_UINT32
Cardinality:	{ 1 }
Range:	0 – 813 (checked)
Values:	Typical value around the middle column of the sub-channel
Units:	dimensionless
Used in:	Calculation of Spectral calibration coefficients Calculation of Stray Light correction coefficients Calculation of Radiance Sensitivity correction coefficients Calculation of Irradiance Sensitivity correction coefficients Spectral Calibration
Variable Name:	$ii_{ref,m}$

4.10.13 Spectral Calibration Row Settings

Description:	Settings that specify sets of CCD rows for which the spectral calibration algorithm shall be carried out and for each of these sets, whether the set is applicable for sun or earth measurements and which of the spectra should be used for the fit routines. For details see also [AD_04].
Type:	DFNT_UINT32
Cardinality:	{ UNDEF, 7 }
Range:	0 – 576 (checked)
Values:	-
Units:	dimensionless
Used in:	Spectral Calibration
Variable Name:	$row_settings_m(q,r)$

4.10.14 Spectral Calibration Window Boundaries

Description:	Spectral Calibration Window Boundaries Specifies for each window in the spectral calibration algorithm, the wavelength range for that window.
Type:	DFNT_FLOAT32
Cardinality:	{ UNDEF, 2 }
Range:	200 – 600 (checked)
Values:	Each row (slowest iterating dimension) contains λ_{min}, λ_{max} pairs. The number of rows in this dataset must be equal to the number of rows in Spectral Calibration Fit Parameters (section 4.10.10).
Units:	nm
Used in:	Spectral Calibration
Variable Name:	$window_range(n,w)_m$

4.10.15 Spectral Calibration Window Settings

Description:	Spectral Calibration Window Settings Specifies for each window in the spectral calibration algorithm, whether that window should be used for earth / radiance or sun / irradiance measurements and whether a direct fit or DOAS fit should be used.
Type:	DFNT_UINT32
Cardinality:	{ UNDEF, 2 }
Range:	0 – 1 (checked)
Values:	First column indicates if window should be used for radiance (value = 0) or irradiance measurements (value = 1). Second column indicates whether to use DOAS fit (value = 1) or the Direct fit function (value = 1) The number of rows in this dataset must be equal to the number of rows in Spectral Calibration Fit Parameters (section 4.10.10).
Units:	dimensionless
Used in:	Spectral Calibration
Variable Name:	$window_settings(n,w)_m$

4.10.16 Sun Spectrum

Description:	Set of high resolution solar irradiance reference spectra convoluted with the OMI slit function. This reference spectrum is used in the Spectral Calibration algorithm Since the slit function varies by for the rows in the CCD and also varies for the different sub-channels UV1, UV2 and VIS, it is possible to supply a set of spectra for each sub-channel. Based on the settings for the spectral calibration algorithm, the spectra can be linked to different (sets of) rows in the CCD.
Type:	DFNT_FLOAT32
Cardinality:	{ UNDEF, UNDEF }
Range:	-
Values:	The first column in this dataset contains wavelengths (Typical spacing = 0.01 nm). Remaining columns contain the corresponding spectrum intensities.
Units:	nm for first column, p / (s.nm.cm^2) for remaining columns.
Used in:	Spectral Calibration
Variable Name:	$I_{sun}(\lambda)_{k,m,n}$

4.11 Group UV/UV1/Image data

Use same parameters and settings as in Group UV/UV2/Image data, described in section 4.7.

4.12 Group UV/UV1/Instrument parameters

Use same parameters and settings as in Group UV/UV2/Instrument parameters, described in section 4.8

4.13 Group UV/UV1/Limit settings

Use same parameters and settings as in Group UV/UV2/Limit settings, described in section 4.9.

4.14 Group UV/UV1/Spectral Calibration data

Use same parameters and settings as in Group UV/UV2/Spectral Calibration data, described in section 4.10 with the exception of slit illumination correction coefficients [4.10.4] which does not exist for UV1.

4.15 Group VIS/General/Image data

Use same parameters and settings as in Group UV/General/Image data, described in section 4.4.

4.16 Group VIS/General/Instrument parameters

Use same parameters and settings as in Group UV/General/Instrument parameters, described in section 4.5. with the exception of UV VIS

4.17 Group VIS/General/Limit settings

Use same parameters and settings as in Group UV/General/Limit settings, described in section 4.6.

4.18 Group VIS/VIS/Image data

Use same parameters and settings as in Group UV/UV2/Image data, described in section 4.7.

4.19 Group VIS/VIS/Instrument parameters

Use same parameters and settings as in Group UV/UV2/Instrument parameters, described in section 4.8.

4.20 Group VIS/VIS/Limit settings

Use same parameters and settings as in Group UV/UV2/Limit settings, described in section 4.9.

4.21 Group VIS/VIS/Spectral Calibration data

Use same parameters and settings as in Group UV/UV2/Spectral Calibration data, described in section 4.10.

5. OPF Metadata

In order to be able to store the Operational Parameters Files (OPFs) for the L0-1B Ground Data Processing Software in the DAAC, metadata must be created / stored with the OPF. This section describes metadata for the OPF.

The metadata attributes are split up into four categories:

- Inventory level metadata attributes are standard (i.e. defined by ECS) metadata which are typically different for each granule and which are searchable. Inventory metadata are stored in the CoreMetadata.0 file attribute of the OMI L-1B OPF HDF file.
- PSAs (Product Specific Attributes) are also inventory level metadata, but are non-standard (i.e. defined by the project scientists). PSAs are searchable and are stored in the CoreMetadata.0 file attribute. For the OMI L0-1B OPF, no PSAs are defined.
- Collection level metadata are standard metadata, which do not (or seldom) change during the mission of the instrument. Rather then describing (the contents of) a single product, the collection level metadata describe the contents of all products that are generated during the mission. Collection level metadata are searchable, but since the metadata are static, they are not stored in the OPF itself.
- Archive level metadata are non-standard metadata. The archive level metadata are not searchable and are stored in the ArchiveMetadata.0 file attribute of the OMI L0-1B OPF HDF file.

5.1 Collection Metadata

ESDT Object or Group Name	Data_ Location	Type / Size	Mandatory	Class	NUM_VAL	Population	Description
Collection metadata							
DLLName	"MCF"	VA255	"TRUE"		1	e.g. "libDsESDTOmOMIPoly.001Sh.so"	
SpatialSearchType	"MCF"	VA40	"TRUE"		1	"Not supported"	
ShortName	"MCF"	A8	"TRUE"		1	"OML1BOPF"	This name will identify the short name associated with the collection or granule. This includes the ECS Technical Baseline product names, i.e. CER02, MOD12, etc. This is the official reference name used in identifying the contents of the data collection.
LongName	"MCF"	VA80	"TRUE"		1	"OMI/Aura Level 1B Operational Parameters File"	This attribute will identify the long name associated with the collection. This includes dataset name/product name. This is the reference name used in describing the scientific contents of the data collection; it is not the 'id' of the data.
CollectionDescription	"MCF"	VA255	"TRUE"		1	"Instrumental calibration parameters used for processing OMI Level 0 to Level 1B data products"	This attribute identifies the major emphasis of the content of the collection.Some examples are:'cloud top products generated from instrument X',or 'all products containing the parameter sea surface temperature as skin temp'.
VersionID	"MCF"	I	"TRUE"		1	1	Version identifier of the data collection.
RevisionDate	"MCF"	D	"TRUE"		1	e.g. "2001-10-25"	Represents the date and possibly the time that this directory entry was created or the latest date and time of its modification or update.
ProcessingCenter	"MCF"	VA20	"TRUE"		1	e.g. "OMI SIPS"	Center where collection was or is being processed.i.e.name of DAAC or SCF.

ESDT Object or Group Name	Data_ Location	Type / Size	Mandatory	Class	NUM_VAL	Population	Description
ArchiveCenter	"MCF"	VA20	"TRUE"		1	"GSFC"	Center where collection is archived.
VersionDescription	"MCF"	VA255	"TRUE"		1	"Pre-launch test using simulated and on-ground acquired data"	A brief description of the differences between this collection version and another collection version.
ContactOrganizationContainer	"NONE"		"TRUE"	"1"			
Role	"MCF"	VA20	"TRUE"	"1"	1	"Archive"	Classification of individuals who are associated with a given data set.
HoursofService	"MCF"	VA255	"TRUE"	"1"	1	"08:00:00 to 18:00:00 EDT (- 0500 GMT)"	Time period when individuals can speak to the organization or individuals.
ContactInstructions	"MCF"	VA255	"TRUE"	"1"	1	"Contact for format/distribution issues"	Supplemental instructions on how or when to contact the individual or organization.
ContactOrganizationName	"MCF"	VA255	"TRUE"	"1"	1	"Goddard DAAC User Services"	The organization and the member of the organization, associated with the data set. Used in cases where the association of the organization to the data set is more significant than the association of the person to the data set.
ContactOrganizationAddress				"1"			
ContactOrganizationAddressContainer	"NONE"		"TRUE"	"1"			
StreetAddress	"MCF"	VA80	"TRUE"	"1"	1	"NASA/GSFC Code 902"	An address line for the address, used for mailing or physical addresses of organizations or individuals who serve as points of contact.
City	"MCF"	VA30	"TRUE"	"1"	1	"GREENBELT"	The city of the person or organization.
StateProvince	"MCF"	VA30	"TRUE"	"1"	1	"MD"	The state or province of the address.
PostalCode	"MCF"	VA20	"TRUE"	"1"	1	"20771"	The zip or other postal code of the address.
Country	"MCF"	VA10	"TRUE"	"1"	1	"USA"	The country of the address.
OrganizationTelephone				"1"			
OrganizationTelephoneContainer	"NONE"		"TRUE"	"1"			
TelephoneNumber	"MCF"	VA23	"TRUE"	"1"	1	"301-614-5473"	Number of organization or individual who is point of contact.The general format of the number includes country, area, and STD codes, as required for the full telephone number. Multi-extensions should be single entries rather than part of a single entry text.
TelephoneNumberType	"MCF"	A10	"TRUE"	"1"	1	"Voice"	The type of telephone number being provided in this instance of the phone number, in order to reach the organization or individual who serves as a point of contact. Voice number is used to speak to the organization or individual, the TDD/TTY number which hearing-impaired can converse with the organization or individual, or the fa(x)csimile number of the organizations or individuals.
OrganizationTelephoneContainer	"NONE"		"TRUE"	"2"			
TelephoneNumber	"MCF"	VA23	"TRUE"	"2"	1	"301-614-5304"	Number of organization or individual who is point of contact.The general format of the number includes country, area, and STD codes,as required for the full telephone number.Multi-extensions should be single entries rather than part of a single entry text.
TelephoneNumberType	"MCF"	A10	"TRUE"	"2"	1	"Facsimile"	The type of telephone number being provided in this instance of the phone number, in order to reach the organization or individual who serves as a point of contact. Voice number is used to speak to the organization or individual, the TDD/TTY number which hearing-impaired can converse with the organization or individual, or the fa(x)csimile number of the organizations or individuals.
OrganizationEmail				"1"			

ESDT Object or Group Name	Data_ Location	Type / Size	Mandatory	Class	NUM_VAL	Population	Description
ElectronicMailAddress	"MCF"	VA255	"TRUE"		1	"daac_usg@gsfcsrvr4.gsfcmo.ecs.nasa.gov"	The address of the electronic mailbox of the organization or individual. The address, following NASA Global Change Master Directory format, should be of the form 'network name>network address'. Examples of network names are NSN, SPAN, telemail, ARPANET, and Internet. Examples of network addresses are NSSDCA::NG, MIKEMARTIN/NASA, MMARTIN@JPL.MILVAX, or mikem@eos.hitc.com.
ContactOrganizationContainer	"NONE"		"TRUE"	"2"			
Role	"MCF"	VA20	"TRUE"	"2"	1	"Producer"	Classification of individuals who are associated with a given data set.
HoursofService	"MCF"	VA255	"TRUE"	"2"	1	"09:00:00 to 17:00:00 CET (+ 0100 GMT)"	Time period when individuals can speak to the organization or individuals.
ContactInstructions	"MCF"	VA255	"TRUE"	"2"	1	"Contact for general questions regarding the OMI project"	Supplemental instructions on how or when to contact the individual or organization.
ContactOrganizationName	"MCF"	VA255	"TRUE"	"2"	1	"NIVR"	The organization and the member of the organization, associated with the data set. Used in cases where the association of the organization to the data set is more significant than the association of the person to the data set.
ContactOrganizationAddress				"2"			
ContactOrganizationAddressContainer	"NONE"		"TRUE"	"1"			
StreetAddress	"MCF"	VA80	"TRUE"	"1"	1	"P.O. Box 35"	An address line for the address, used for mailing or physical addresses of organizations or individuals who serve as points of contact.
City	"MCF"	VA30	"TRUE"	"1"	1	"Delft"	The city of the person or organization.
StateProvince	"MCF"	VA30	"TRUE"	"1"	1	"ZH"	The state or province of the address.
PostalCode	"MCF"	VA20	"TRUE"	"1"	1	"NL-2600AA"	The zip or other postal code of the address.
Country	"MCF"	VA10	"TRUE"	"1"	1	"NLD"	The country of the address.
OrganizationTelephone				"2"			
OrganizationTelephoneContainer	"NONE"		"TRUE"	"1"			
TelephoneNumber	"MCF"	VA23	"TRUE"	"1"	1	"+31-15-2788025"	Number of organization or individual who is point of contact.The general format of the number includes country, area, and STD codes, as required for the full telephone number. Multi-extensions should be single entries rather than part of a single entry text.
TelephoneNumberType	"MCF"	A10	"TRUE"	"1"	1	"Voice"	The type of telephone number being provided in this instance of the phone number, in order to reach the organization or individual who serves as a point of contact. Voice number is used to speak to the organization or individual, the TDD/TTY number which hearing-impaired can converse with the organization or individual, or the fa(x)csimile number of the organizations or individuals.
OrganizationTelephoneContainer	"NONE"		"TRUE"	"2"			
TelephoneNumber	"MCF"	VA23	"TRUE"	"2"	1	"+31-15-2623096"	Number of organization or individual who is point of contact.The general format of the number includes country, area, and STD codes,as required for the full telephone number.Multi-extensions should be single entries rather than part of a single entry text.
TelephoneNumberType	"MCF"	A10	"TRUE"	"2"	1	"Facsimile"	The type of telephone number being provided in this instance of the phone number, in order to reach the organization or individual who serves as a point of contact. Voice number is used to speak to the organization or individual, the TDD/TTY number which hearing-impaired

ESDT Object or Group Name	Data_ Location	Type / Size	Mandatory	Class	NUM_VAL	Population	Description
							can converse with the organization or individual, or the fa(x)csimile number of the organizations or individuals.
OrganizationEmail				"2"			
ElectronicMailAddress	"MCF"	VA255	"TRUE"		1	"omi@nivr.nl"	The address of the electronic mailbox of the organization or individual. The address, following NASA Global Change Master Directory format, should be of the form 'network name>network address'. Examples of network names are NSN, SPAN, telemail, ARPANET, and Internet. Examples of network addresses are NSSDCA::NG, MIKEMARTIN/NASA, MMARTIN@JPL.MILVAX, or mikem@eos.hitc.com.
DisciplineTopicParametersContainer	"NONE"		"TRUE"	"1"			
ECSDisciplineKeyword	"MCF"	VA24	"TRUE"	"1"	1	"Earth Science"	Keyword used to describe the general discipline area of the collection.A collection can conceivably cover several disciplines.
ECSTopicKeyword	"MCF"	VA32	"TRUE"	"1"	1	"Atmosphere"	Keyword used to describe the general topic area of the collection.A collection can conceivably cover several topics.
ECSTermKeyword	"MCF"	VA50	"TRUE"	"1"	1	"Atmospheric Radiation"	Keyword used to describe the science parameter area of the collection.A collection can conceivably cover many such parameters.
ECSVariableKeyword	"MCF"	VA80	"TRUE"	"1"	1	"Radiative Flux"	Keyword used to describe the specific science parameter content of the collection. A collection can conceivably cover many specific parameters. The keyword valids are the lowest level physical parameter terms which are normally searched by a user; i.e. a user enters a keyword which when found may connect with one or more parameters from collections. The keywords are also the lowest level words which describe product content without being the server specific measurement (held in Parameter class). While there is a controlled list of these parameters held by GCMD, additions can be made by an as yet unspecified configuration control process.
ProcessingLevelDescription	"MCF"	VA80	"TRUE"		1	"Calibration Parameters"	This attribute provides a set of characteristics that can be combined to define science processing levels which do not conform to the standards found in ProcessingLevelID.
ProcessingLevelID	"MCF"	A6	"TRUE"		1	"1B"	This attribute reflects the classification of the science data processing level, which defines in general terms the characteristics of the output of the processing performed.
PlatformContainer	"NONE"		"TRUE"	"1"			
PlatformShortName	"MCF"	VA20	"TRUE"	"1"	1	"Aura"	The unique platform name.(e.g.GOES-8).
PlatformLongName	"MCF"	VA80	"TRUE"	"1"	1	"EOS Aura Mission Satellite"	The expanded or long name of the platform associated with an instrument.
PlatformType	"MCF"	VA20	"TRUE"	"1"	1	"Spacecraft"	
PlatformCharacteristic				"1"			
PlatformCharacteristicContainer	"NONE"		"TRUE"	"1"			
PlatformCharacteristicName	"MCF"	VA40	"TRUE"	"1"	1	"OrbitInclination"	The name of the Platform Characteristic attribute.
PlatformCharacteristicDescription	"MCF"	VA80	"TRUE"	"1"	1	"Angle between the orbit plane and the Earth's equatorial plane"	Description of the Platform Characteristic attribute.
PlatformCharacteristicDataType	"MCF"	A8	"TRUE"	"1"	1	"float"	The datatype of the Platform Characteristic/attribute defined by PlatformCharacteristicName.

ESDT Object or Group Name	Data_ Location	Type / Size	Mandatory	Class	NUM_VAL	Population	Description
PlatformCharacteristicUnit	"MCF"	VA20	"TRUE"	"1"	1	"Degrees"	Units associated with the Platform Characteristic attribute value.
PlatformCharacteristicValueClass				"1"			
PlatformCharacteristicValue	"MCF"	VA20	"TRUE"	"1"	1	"98.2"	The value of the characteristic/attribute defined in PlatformCharacteristic. Attributes must have single values.(e.g. Model Number =209).
Instrument				"1"			
InstrumentContainer	"NONE"		"TRUE"	"1"			
InstrumentShortName	"MCF"	VA20	"TRUE"	"1"	1	"OMI"	The unique identifier of an instrument (e.g. ASTER, AVHRR-3, CERES, Human).
InstrumentLongName	"MCF"	VA80	"TRUE"	"1"	1	"Ozone Monitoring Instrument"	The expanded name of the primary sensory instrument (e.g. Advanced Spaceborne Thermal Emission and Reflective Radiometer, Clouds and the Earth's Radiant Energy System, Human Observation).
InstrumentTechnique	"MCF"	VA80	"TRUE"	"1"	1	"Nadir-Viewing Cross-Track Imaging Spectroradiometry"	The instrument method or procedure (e.g. radiometer, manual enumeration).
NumberofSensors	"MCF"	I	"TRUE"	"1"	1	2	The number of discrete (if any) sensors on an instrument.
Sensor				"1"			
SensorContainer	"NONE"		"TRUE"	"1"			
SensorShortName	"MCF"	VA20	"TRUE"	"1"	1	"CCD Ultra Violet"	A sensor is a defined sensory sub-component of an instrument (e.g. InstrumentShortName=ASTER, NumberofSensors=3, SensorShortName=SWIR, SensorShortName=TIR, SensorShortName=VNIR). In cases where the Instrument has a single Sensor or the Instrument and Sensor are synonomous then both attributes should be populated (e.g. AVHRR). Sensors cannot exist without Instruments.
SensorLongName	"MCF"	VA80	"TRUE"	"1"	1	"Charge Coupled Device Ultra Violet"	The generic or long name description of a sensor (e.g. Visible-Near Infrared, Human Visual, Human Auditory).
SensorTechnique	"MCF"	VA80	"TRUE"	"1"	1	"Frame Transfer CCD Imaging Spectroradiometry"	The sensor technique (e.g. laser altimetry).
SensorCharacteristic				"1"			
SensorCharacteristicContainer	"NONE"		"TRUE"	"1"			
SensorCharacteristicName	"MCF"	VA40	"TRUE"	"1"	1	"CCD_UV_bandwidth"	The name of the Sensor Characteristic/attribute. Sensor attributes defined using SensorCharacteristicName must be single-valued attributes of the object 'Sensor' and not attributes of undefined objects.
SensorCharacteristicDescription	"MCF"	VA80	"TRUE"	"1"	1	"The sensor's Ultra Violet wavelength range"	A description of the attribute defined by SensorCharacteristicName (e.g. SensorCharacteristicName=SensorDevice, SensorCharacteristicDescription=Charge coupled device).
SensorCharacteristicDataType	"MCF"	A8	"TRUE"	"1"	1	"varchar"	The datatype of the Instrument Characteristic/attribute defined by InstrumentCharacteristicName.
SensorCharacteristicUnit	"MCF"	VA20	"TRUE"	"1"	1	"nm"	The unit of the Sensor Characteristic (e.g. nanometers).
SensorCharacteristicValueClass				"1"			
SensorCharacteristicValue	"MCF"	VA80	"TRUE"	"1"	1	"270-380"	The value of the attribute defined in the class SensorCharacteristicDescription. Attributes must have single values.
SensorContainer	"NONE"		"TRUE"	"2"			

ESDT Object or Group Name	Data_ Location	Type / Size	Mandatory	Class	NUM_VAL	Population	Description
SensorShortName	"MCF"	VA20	"TRUE"	"2"	1	"CCD Visible"	A sensor is a defined sensory sub-component of an instrument (e.g. InstrumentShortName=ASTER, NumberofSensors=3, SensorShortName=SWIR, SensorShortName=TIR, SensorShortName=VNIR). In cases where the Instrument has a single Sensor or the Instrument and Sensor are synonomous then both attributes should be populated (e.g. AVHRR). Sensors cannot exist without Instruments.
SensorLongName	"MCF"	VA80	"TRUE"	"2"	1	"Charge Coupled Device Visible"	The generic or long name description of a sensor (e.g. Visible-Near Infrared, Human Visual, Human Auditory).
SensorTechnique	"MCF"	VA80	"TRUE"	"2"	1	"Frame Transfer CCD Imaging Spectroradiometry"	The sensor technique (e.g. laser altimetry).
SensorCharacteristic				"2"			
SensorCharacteristicContainer	"NONE"		"TRUE"	"1"			
SensorCharacteristicName	"MCF"	VA40	"TRUE"	"1"	1	"CCD_VIS_bandwidth"	The name of the Sensor Characteristic/attribute. Sensor attributes defined using SensorCharacteristicName must be single-valued attributes of the object 'Sensor' and not attributes of undefined objects.
SensorCharacteristicDescription	"MCF"	VA80	"TRUE"	"1"	1	"The sensor's Visible wavelength range."	A description of the attribute defined by SensorCharacteristicName (e.g. SensorCharacteristicName=SensorDevice, SensorCharacteristicDescription=Charge coupled device).
SensorCharacteristicDataType	"MCF"	A8	"TRUE"	"1"	1	"varchar"	The datatype of the Instrument Characteristic/attribute defined by InstrumentCharacteristicName.
SensorCharacteristicUnit	"MCF"	VA20	"TRUE"	"1"	1	"nm"	The unit of the Sensor Characteristic (e.g. nanometers).
SensorCharacteristicValueClass				"1"			
SensorCharacteristicValue	"MCF"		"TRUE"	"1"	1	"350-500"	The value of the attribute defined in the class SensorCharacteristicDescription. Attributes must have single values.

5.2 Inventory Metadata

ESDT Object or Group Name	Level	Data_ Location	Class	NUM_VAL	TYPE	DATATYPE	Mandatory	Valids	Population method	Description
Inventory metadata										
SizeMBECSDataGranule	Granule	"DSS"		1	"DOUBLE"	F10	"FALSE"		N/A	The size attribute will indicate the volume of data contained in the granule.
LocalGranuleID	Granule	"PGE"		1	"STRING"	VA80	"TRUE"			Unique identifier for locally produced granule that ECS ingests and is required to capture.
ProductionDateTime	Granule	"TK"		1	"DATETIME"	DT	"TRUE"		N/A	The date and time a specific granule was produced by a PGE.

ESDT Object or Group Name	Level	Data_ Location	Class	NUM_VAL	TYPE	DATATYPE	Mandatory	Valids	Population method	Description
ShortName		"MCF"		1	"STRING"	A8	"TRUE"	"OML1BOPF"	OML1BOPF	This name will identify the short name associated with the collection or granule. This includes the ECS Technical Baseline product names, i.e. CER02, MOD12, etc. This is the official reference name used in identifying the contents of the data collection.
VersionID		"MCF"		1	"INTEGER"	I	"TRUE"		1	Version identifier of the data collection.
RangeBeginningDate	Granule	"PGE"		1	"DATE"	D	"TRUE"			The year (and optionally month, or month and day) when the temporal coverage period being described began.
RangeBeginningTime	Granule	"PGE"		1	"TIME"	T	"TRUE"			The first hour (and optionally minute or minute and second of the temporal coverage period being described.
RangeEndingDate	Granule	"PGE"		1	"DATE"	D	"TRUE"			The last year (and optionally month, or month and day) of the temporal coverage period being described.
RangeEndingTime	Granule	"PGE"		1	"TIME"	T	"TRUE"			The last hour (and optionally minute or minute and second of the temporal coverage period being described for granule or collection.

5.3 Archive Metadata

AttributeName	AttributeDescription	Attribute Data Type	Data_ Location	Data Length	Valids	Min Value	Max Value	Population method
Standard								
ESDTDescriptorRevision	Version of the ESDT descriptor file	varchar	"MCF"	255				From MCF

5.4 Product Specific Attributes (PSAs)

No Product Specific Attributes have been defined for the OPF.