INTERFACE CONTROL DOCUMENT

SMOS GMT

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GMV AEROSPACE AND DEFENCE S.A./DEIMOS ENGENHARIA S.A..
Isaac Newton 11, PTM Tres Cantos, 28760 Madrid
Tel. +34 918072100, Fax. +34 918072199
www.gmv.com

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Prepared by: Oscar Portela (GMV)
Gonçalo Lopes (DME)
Miguel Santos (DME)
João Cruz (DME)

Approved by: Jose María Martínez Fadrique
José Barbosa (DME)
Daniel Barros (DME)

Authorized by: Jose María Martínez Fadrique

DOCUMENT STATUS SHEET

Version	Date	Pages	Changes
1.0	21/12/2007	60	First version
1.1	23/01/2008	64	Section 3: Integration with the MF will be based on a command line interface Section 4.7.4: *General* structure added to hold those parameters not bound to a particular map Section 4.7.4: *Report* parameter added to indicate the path where the GMT report shall be written Section 4.7.4: *Directories* tag renamed as *Paths* Section 4.7.4: Description of the *Output* configuration parameter now indicates its scope Section 4.7.4: *Logos* parameter added to the set of paths Section 4.7.4: *Rotation* parameter added to the map center definition Section 4.7.4: Reference to the L1 and L2 product specifications added to the *Parameter* description Section 4.7.4: Valid values for the *Polarization* parameter updated according to L1 product specification Section 4.7.4: Description of the *NIR_Element* configuration parameter slightly improved Section 4.7.5: Sample GMT configuration updated Section 4.8.3: Counter added to the instance ID in report filenames to prevent conflicts Section 4.8.4: *General* structure added to hold those parameters not bound to a particular map Section 4.8.4: *Report* parameter added to indicate the path where the GMT report shall be written Section 4.8.4: *Start*, *Stop* and *Elapsed* times of the tool execution added to the report Section 4.8.4: *Directories* tag renamed as *Paths* Section 4.8.4: *Logos* parameter added to the set of paths Section 4.8.4: *Rotation* parameter added to the map center definition Section 4.8.5: Sample GMT report updated Section 4.9.3: Parameter field in map filenames required to be in uppercase following EEFF conventions
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2.9	13/12/2013	153	Section 5.10.5: • Added footnote to specify the product schema version for X_swath and Dg_RFI_L1 display Section 5.11.5: • Added footnote to specify the product schema version for Dg_galactic_Noise_Pol, Sigma_WS and Sigma_SST display • Added the following parameters: Dg_RFI_L1, Dg_RFI_X and Dg_RFI_Y Section 5.21.5: • Added the following parameters: Tau_Nad_LV_Asc, Tau_Nad_LV_Desc, Tau_Nad_LV_DQX_Asc, Tau_Nad_LV_DQX_Desc, DT_Branch_LV_Asc, DT_Branch_LV_Desc, Date_Stamp_LV_Asc and Date_Stamp_LV_Desc Section 5.22.5: • Added the following parameters: Tau_Nad_FO_Asc, Tau_Nad_FO_Desc, Tau_Nad_FO_DQX_Asc, Tau_Nad_FO_DQX_Desc, DT_Branch_FO_Asc, DT_Branch_FO_Desc, Date_Stamp_FO_Asc and Date_Stamp_FO_Desc. Section 5.23.5: • Added the following parameters: HR_Asc, HR_Desc, HR_DQX_Asc, HR_DQX_Desc, DT_Branch_HR_Asc, DT_Branch_HR_Desc, Date_Stamp_HR_Asc and Date_Stamp_HR_Desc Section 5.24.5: • Added the following parameters: N_Snap_Asc, N_Snap_Desc, N_RFI_X_Asc, N_RFI_X_Desc, N_RFI_Y_Asc, N_RFI_Y_Desc, Normalized_RFI_Asc, and Normalized_RFI_Desc
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3.1	15/06/2016		Section 5.11.5: • Update the MIR_OSUDP2 V660 (schema version 7.2.1) supported parameters. • Update the f MIR_OSUDP2 V660 (schema version 7.2.1) supported filters • Add footnote specifying that Annex B has the supported parameters for the prior MIR_OSUDP2 products Annex B: SMOS L2 Ocean salinity user data products (MIR_OSUDP2) prior v660 format valid parameters
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1 INTRODUCTION

1.1 PURPOSE

The purpose of the present document is to describe the format, structure and file naming policies of the input files employed by the SMOS GMT software, and the outputs generated by it.

1.2 SCOPE

This document is applicable within the scope of the SMOS GMT project, for which it has been produced.

1.3 DEFINITIONS AND ACRONYMS

1.3.1 DEFINITIONS

The following concepts and terms are used in the document and have been identified as necessary to be defined:

Concept / Term	Definition
DLM	Dynamically Loadable Modules are a way of packaging functions written in C or Fortran so that they may be called from within IDL, as if the routines were a native part of this language. They consist on two files: a text file specifying what routines are provided by the module, and a dynamic library which contains the actual implementation of these.
XML	The eXtensible Markup Language is a simple, very flexible text format derived from SGML (ISO 8879). Originally designed to meet the challenges of large-scale electronic publishing, XML is also playing an increasingly important role in the exchange of a wide variety of data on the Web and elsewhere.

1.3.2 ACRONYMS

The following acronyms are used in the document and have been identified as necessary to be described:

Acronym	Definition
1D	One-dimensional
AD	Applicable Document
ADF	Auxiliary Data File
AF	Alias Free
API	Application Programming Interface
AVA	Available
BinX	Binary XML description language
BT	Brightness Temperature
BW	Browse product
CASA	Construcciones Aeronáuticas S.A.
DAP	Data Analysis Product
dB	Decibel
DFFG	Discrete Flexible Fine Grid
DGG	Digital Global Grid
DME	DEIMOS Engenharia S.A
DLM	Dynamically Loadable Module
DPGS	Data Processing Ground Segment
DQX	Theoretical Retrieval Uncertainty

Acronym	Definition
EADS	European Aeronautic Defense and Space
EAF	Extended Alias Free
ECMWF	European Center for Medium range Weather Forecasting
EEFF	Earth Explorer File Format
EPS	Encapsulated Postscript
ESL	Expert Support Laboratories
FFT	Fast Fourier Transform
FO	Forest
FOV	Field of View
FTT	Flat Target Transformation
GHz	Gigahertz
GMT	Global Mapping Tool
GQX	Global Quality Index
GS	Ground Segment
HI	Neutral Hydrogen
HKTM	Housekeeping Telemetry
ICD	Interface Control Document
ID	Identifier
IDL	Interactive Data Language
IEC	International Electrotechnical Commission
IONEX	IONosphere Map Exchange
ISEA	Icosahedral Snyder Equal Area
ISO	International Standards Organization
ITU	International Telecommunication Union
JPEG	Joint Photographic Experts Group
K	Kelvin
KB	Kilobyte (i.e. 1024 bytes)
L0	Level 0
L1	Level 1 (i.e. L1A, L1B and/or L1C)
L1A	Level 1A
L1B	Level 1B
L1C	Level 1C
L1OP	Level 1 Operational Processor
L2	Level 2
L2OP	Level 2 Operational Processor
LAI	Leaf Area Index
LUT	Look Up Table
LV	Lower Vegetation
MB	Megabyte (i.e. 1024 KB)
MF	Monitoring Facility
MHz	Megahertz
MIRAS	Microwave Imaging Radiometer with Aperture Synthesis
MODIS	Moderate Resolution Imaging Spectroradiometer
N/A	Not Applicable
NIR	Noise Injection Radiometer
OOR	Out Of Range
OS	Ocean Salinity
OW	Open Water
PID	Process Identifier

Acronym	Definition
PLM	Payload Module
PMS	Power Measurement System
PNG	Portable Network Graphics
PR	Polarization Ratio
PUS	Packet Utilisation Standard
RA	Right Ascension
RD	Reference Document
RFI	Radio Frequency Interference
RMS	Root Mean Square
SC	Science product
SGML	Standard Generalized Markup Language
SM	Soil Moisture
SMOS	Soil Moisture and Ocean Salinity mission
SSS	Sea Surface Salinity
SST	Sea Surface Temperature
STD	Standard (deviation)
TB	Temperature Brightness
TEC	Total Electron Content
TECU	Total Electron Content Units
TLM	Telemetry
TN	Technical Note
TOA	Top Of Atmosphere
UDP	User Data Product
UNIX	UNiplexed Information and Computing System
US	United States
USGS	US Geological Survey
UST	Undisturbed Surface Temperature
VTEC	Vertical Total Electron Content
WS	Wind Speed
XML	eXtensible Markup Language

2 REFERENCES

2.1 APPLICABLE DOCUMENTS

The following documents, of the exact issue shown, form part of this document to the extent specified herein. Applicable documents are those referenced in the Contract or approved by the Approval Authority. They are referenced in this document in the form [AD.X]:

Ref.	Title	Code	Ver.	Date
[AD. 1]	SMOS Level 1 and Auxiliary Data Products Specifications	SO-TN-IDR-GS-0005	5.12	Jul 8th, 2009
[AD. 2]	SMOS Level 2 and Auxiliary Data Products Specifications	SO-TN-IDR-GS-0006	4.6	Nov 6th, 2009
[AD. 3]	DPGS MF Specific Functionality Technical Note	SO-TN-DMS-GS-5400	1.5	Sep 14th, 2007
[AD. 4]	SMOS NRT Product Format Specification	SO-ID-DMS-GS-0002	4.2	Feb 18th, 2019

Table 2-1: Applicable Documents

2.2 REFERENCE DOCUMENTS

The following documents, although not part of this document, amplify or clarify its contents. Reference documents are those not applicable and referenced within this document. They are referenced in this document in the form [RD.X]:

Ref.	Title	Code	Ver.	Date
[RD. 1]	Extensible Markup Language (XML) 1.0	REC-xml-20060816	4.0	Sep 29th, 2006
[RD. 2]	Encapsulated Postscript File Format Specification	Adobe Systems Inc. Tech Note #5002	3.0	May 1st, 1992
[RD. 3]	JPEG Standard	JPEG ISO/IEC 10918-1 ITU-T Recommend. T.81	N/A	1993
[RD. 4]	Portable Network Graphics (PNG) Specification (Second Edition)	ISO/IEC 15948:2003	N/A	Nov 10th, 2003
[RD. 5]	IDL reference guide	N/A	6.3	Apr, 2006

Table 2-2: Reference Documents

3 GLOBAL SYSTEM DESCRIPTION

The Global Mapping Tool allows the user the geographic visualisation of several SMOS data products. The main purpose of the tool is to detect macroscopic errors (e.g. boundary issues between products) in SMOS L1 and L2 science products and HKTM 1A data.

The tool is implemented in IDL and completed with a C/C++ dynamic library. This library allows IDL to call external code and retrieve information which may be used in the plots (e.g. orbit propagator, boresight calculation, etc.). It shall be pointed that the reading of L1A and L1B products could in principle be handled by IDL (as implemented in the MF IDL toolbox) since the structure of the products is fixed. However, the structure of L1C and L2 products is more demanding in terms of data volume and complexity, so these products have to be handled differently if acceptable performances are to be achieved.

In order to improve the performance of the parsing and processing of L1C and L2 products (and even L1A and L1B) a hybrid solution mixing IDL and C/C++ was implemented. C and C++ have better performance than IDL, and this option takes advantage of that by leaving the responsibility of reading and filtering the data to a solution implemented in these languages. In addition, this allows the usage of a BinX based library for the parsing of the products, which reduces the effort that the development and maintenance of specific readers would imply. To this aim, the corresponding C/C++ dynamic library was developed and integrated as a DLM.

IDL DLMs allow the extension of IDL routines (i.e. specific new routines can be used in IDL code as if they were part of the IDL native language). This method allows IDL to call C code in a more efficient way than the call_external function. DLM programming makes use of the IDL internal C API in order to create and pass variables between the IDL session and the C process. The main advantage of the IDL DLMs upon the call_external procedure is that it allows the use of dynamic memory and a better integration between both languages.

The tool has been conceived as a standalone piece of software particularly well suited for batch processing. While it will be typically run independently from the SMOS MF through a shell script, that will invoke the IDL Virtual Machine as necessary, it will also provide a compatible command line interface with this facility ([AD. 3]). The latter will allow the integration of the GMT into the MF with a minimal effort and costs.

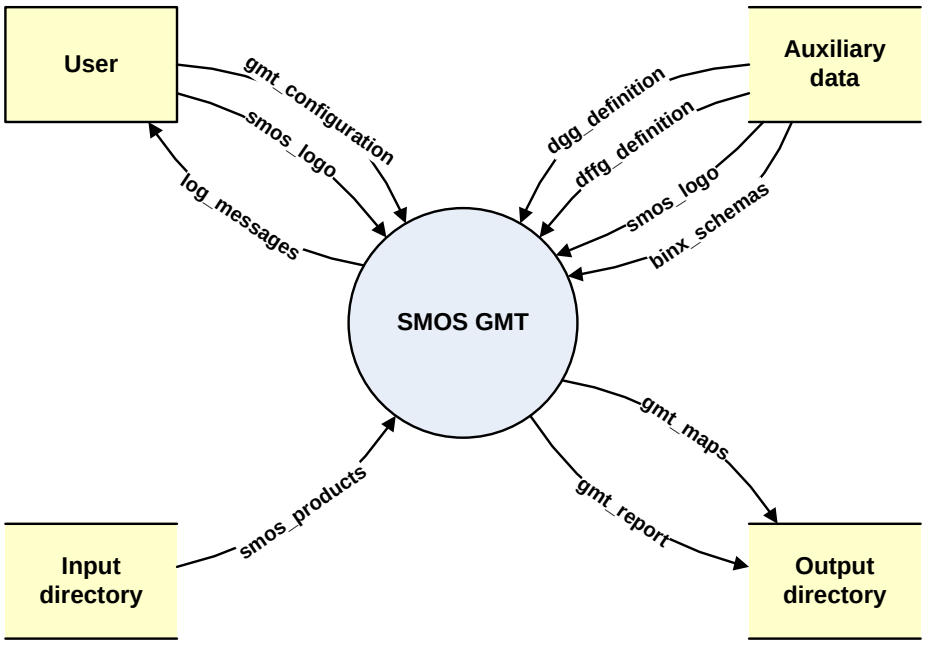

Figure 3-1: Context diagram

4 TOOL INTERFACES

4.1 GMT CONFIGURATION

4.1.1 GENERAL INFORMATION

The configuration files used by the Global Mapping Tool define the various parameters which determine the behaviour of the software, and the particulars of the maps to be generated. Each configuration file contains a self-sufficient set of parameters to be feed to the tool, so that no user interaction is required. The name of the configuration file to load is passed either as a command line argument when launching one of the provided scripts, or as a function parameter when using the MF compatible IDL interface.

It shall be pointed that a single configuration file can be used to request several maps to be plotted, each with a different parameter and/or options. Since the input files are not explicitly listed, but just the directory whose contents the tool shall parse to select the appropriate ones, the same configuration file can also be used to generate different maps by leaving, prior to each run, a different set of input files in that directory.

4.1.2 TYPE AND SIZE

The GMT configuration files are formatted as XML files compliant with [RD. 1].

The size of an individual file may vary depending on the number of map entries defined. However, an educated guess suggests that the typical configuration file would occupy a few KB at most.

4.1.3 FILENAME

Since the path to the configuration file, including its filename, is provided as a parameter to the GMT tool, no particular naming scheme is required to be followed. Instead, the user may establish the name of the configuration files as he/she sees fit.

4.1.4 STRUCTURE

The following tree illustrates the XML structure of any valid configuration file:

Element	Type	Occurrences	Default value
GMT_Configuration	Tag	1	
├─General	Tag	1	
│ ├─File_Type	String	0 or 1	**REP_GMT___**
│ └─Paths	Tag	1	
│ └─Report	String	1	
└─Map	Tag	1 or more	
├─Paths	Tag	1	
│ ├─Input	String	1	
│ ├─Output	String	1	
│ └─Logos	String	0 or 1	
├─Picture	Tag	0 or 1	
│ ├─Format	String	0 or 1	**PNG**
│ ├─Width	Integer	0 or 1	**3600**
│ ├─Height	Integer	0 or 1	**1800**

│ ├─Overlay	String	0 or 1	**Low**
│ ├─Labels	String	0 or 1	**None**
│ ├─Projection	Tag	0 or 1	
│ │ ├─Equator	String	0 or 1	**Cylindrical**
│ │ └─Poles	String	0 or 1	**Orthographic**
│ ├─Center	Tag	0 or 1	
│ │ ├─Latitude	Real	0 or 1	**0.0**
│ │ ├─Longitude	Real	0 or 1	**0.0**
│ │ └─Rotation	Real	0 or 1	**0.0**
│ ├─Region	Tag	0 or 1	
│ │ ├─LatitudeMin	Real	0 or 1	**-90.0**
│ │ ├─LatitudeMax	Real	0 or 1	**90.0**
│ │ ├─LongitudeMin	Real	0 or 1	**-180.0**
│ │ └─LongitudeMax	Real	0 or 1	**180.0**
│ └─Scale	Tag	0 or 1	
│ ├─Palette	Integer	0 or 1	**34**
│ ├─Minimum	Real	0 or 1	***None***
│ └─Maximum	Real	0 or 1	***None***
└─Product	Tag	1	
├─Type	String	1	
├─Parameter	String	1	
├─Overlap	String	0 or 1	**Average**
│ ├─Breakpoint	String	0 or 1	**Off**
├─Grid	String	0 or 1	**DGG**
└─Filters	Tag	0 or 1	
├─Orbit	String	0 or 1	**All**
├─Polarization	String	0 or 1	**HH(H)**
├─Antenna	Integer	0 or 1	**1**
├─NIR_Element	String	0 or 1	**AB-H**
├─Field_of_View	String	0 or 1	**All**
├─Incidence_Angle	Tag	0 or 1	
│ ├─Target	Real	0 or 1	**42.5**
│ ├─Minimum	Real	0 or 1	**0.0**
│ ├─Maximum	Real	0 or 1	**90.0**
│ └─Average	String	0 or 1	**1**
├─Fill_Value	Real	0 or 1	***None***
└─Map_Number	Integer	0 or 1	**1**

Table 4-1: GMT configuration structure

The details of the leaf nodes presented in the previous XML tree are offered next:

X-Path	/GMT_Configuration/General/File_Type
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	REP_GMT___
Format	Earth Explorer file type, that is: • **FFFFDDDDDD** , where: • **FFFF** file category, it should always be **REP_** • **DDDDDD** semantic descriptor Note that the semantic descriptor shall contain upper case letters, numbers, underscore characters ("_") only.
Description	File type to be specified in the filename of the MF report generated, if any. Such report (actually a zip file packaging any resulting maps and the GMT report) will only be produced if requested through the command line options (i.e. –o).

X-Path	/GMT_Configuration/General/Paths/Report
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	UNIX path
Description	Path to the directory where the GMT report shall be written.

X-Path	/GMT_Configuration/Map/Paths/Input
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	UNIX path
Description	Path to the directory whose contents shall be parsed when looking for products to be read as input.

X-Path	/GMT_Configuration/Map/Paths/Output
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	UNIX path
Description	Path to the directory where the output files generated for this particular map shall be written.

X-Path	/GMT_Configuration/Map/Paths/Logos
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	N/A
Format	UNIX path
Description	Path to a PNG file containing the mission logo(s) to be included in the output images.

X-Path	/GMT_Configuration/Map/Picture/Format
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	PNG
Format	The valid values are: • **EPS** Encapsulated Postscript • **JPG** Joint Photographic Experts Group • **PNG** Portable Network Graphics
Description	Graphical format to be used in the output files written by the tool.

X-Path	/GMT_Configuration/Map/Picture/Width
Type	Integer
Occurrences	0 or 1 **Optional**
Units	Pixels
Default value	3600
Format	Any value greater than zero in decimal form.
Description	Width of the maps to be generated. Note that the actual picture written by the software may be wider than this in order to account for additional annotations.

X-Path	/GMT_Configuration/Map/Picture/Height
Type	Integer
Occurrences	0 or 1 **Optional**
Units	Pixels
Default value	1800
Format	Any value greater than zero in decimal form.
Description	Height of the maps to be generated. Note that the actual picture written by the software may be taller than this in order to account for additional annotations.

X-Path	/GMT_Configuration/Map/Picture/Overlay
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A

Default value	Low
Format	The valid values are: • **None** Plot no coastline • **Low** Use IDL's low resolution map database • **High** Use IDL's high resolution map database
Description	Coastline overlay settings. If enabled, either the high or low resolution map database from IDL will be used to plot a coastline mask over the projected data, or none at all if disabled.

X-Path	/GMT_Configuration/Map/Picture/Labels
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	None
Format	The valid values are: • **None** Draw no labels • **Start_Time** Use the start time from the respective input files
Description	Whether the map shall be annotated with labels, indicating the selected information, which would be drawn next to the point where the ground track from each product crosses the equator. This parameter is only applicable when products whose data is not arranged into a grid (i.e. L1A and L1B) are used as input.

X-Path	/GMT_Configuration/Map/Picture/Projection/Equator
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	Cylindrical
Format	The valid values are: • **Orthographic** • **LambertConic** • **LambertAzimuthal** • **AzimuthalEquidistant** • **Satellite** • **Cylindrical** • **Mercator** • **Mollweide** • **Sinusoidal** • **Aitoff** • **HammerAitoff** • **AlbersEqualAreaConic** • **TransverseMercator** • **MillerCylindrical** • **Robinson**

	• **GoodesHomolosine**
Description	Map projection to be used for plotting the view at the equator of the data, among those offered by IDL. Please refer to the IDL reference manual, [RD. 5], for further details on the particulars of each of these.

X-Path	/GMT_Configuration/Map/Picture/Projection/Poles
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	Orthographic
Format	The valid values are: • **Orthographic** • **LambertConic** • **LambertAzimuthal** • **AzimuthalEquidistant** • **Satellite** • **Cylindrical** • **Mercator** • **Mollweide** • **Sinusoidal** • **Aitoff** • **HammerAitoff** • **AlbersEqualAreaConic** • **TransverseMercator** • **MillerCylindrical** • **Robinson** • **GoodesHomolosine**
Description	Map projection to be used for plotting the view at the poles of the data, among those offered by IDL. Please refer to the IDL reference manual, [RD. 5], for further details on the particulars of each of these.

X-Path	/GMT_Configuration/Map/Picture/Center/Latitude
Type	Real
Occurrences	0 or 1 **Optional**
Units	Degrees
Default value	0.0
Format	Any rational number in the range [-90.0, 90.0].
Description	Latitude coordinate of the location where the equatorial map projection shall be centered.

X-Path	/GMT_Configuration/Map/Picture/Center/Longitude
Type	Real
Occurrences	0 or 1 **Optional**
Units	Degrees

Default value	0.0
Format	Any rational number in the range [-180.0, 180.0].
Description	Longitude coordinate of the location where the equatorial map projection shall be centered.

X-Path	/GMT_Configuration/Map/Picture/Center/Rotation
Type	Real
Occurrences	0 or 1 **Optional**
Units	Degrees
Default value	0.0
Format	Any rational number in the range [-180.0, 180.0].
Description	Rotation of the map with respect to the usual North orientation. In particular, the angle specifies the rotation around an hypothetical line crossing the Earth center and the point on its surface defined by the given coordinates.

X-Path	/GMT_Configuration/Map/Picture/Region/LatitudeMin
Type	Real
Occurrences	0 or 1 **Optional**
Units	Degrees
Default value	-90.0
Format	Any rational number in the range [-90.0, 90.0].
Description	Minimum latitude of the region to be represented in the equatorial map projection, defining the South boundary of the corresponding area.

X-Path	/GMT_Configuration/Map/Picture/Region/LatitudeMax
Type	Real
Occurrences	0 or 1 **Optional**
Units	Degrees
Default value	90.0
Format	Any rational number in the range [-90.0, 90.0].
Description	Maximum latitude of the region to be represented in the equatorial map projection, defining the North boundary of the corresponding area.

X-Path	/GMT_Configuration/Map/Picture/Region/LongitudeMin
Type	Real
Occurrences	0 or 1 **Optional**
Units	Degrees
Default value	-180.0
Format	Any rational number in the range [-180.0, 180.0].
Description	Minimum longitude of the region to be represented in the equatorial map projection, defining the West boundary of the corresponding area.

X-Path	/GMT_Configuration/Map/Picture/Region/LongitudeMax

Type	Real
Occurrences	0 or 1 **Optional**
Units	Degrees
Default value	180.0
Format	Any rational number in the range [-180.0, 180.0].
Description	Maximum longitude of the region to be represented in the equatorial map projection, defining the East boundary of the corresponding area.

X-Path	/GMT_Configuration/Map/Picture/Scale/Palette
Type	Integer
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	34
Format	Any integer number in the range [0, 40]. See Annex A, at the end of this document, for a comprehensive list of all the available palettes and their associated identifiers.
Description	Number of the predefined IDL color table to use in the plot scale for the representation of the different data values.

X-Path	/GMT_Configuration/Map/Picture/Scale/Minimum
Type	Real
Occurrences	0 or 1 **Optional**
Units	Those of the selected parameter.
Default value	*None*
Format	Any rational number in decimal form.
Description	Value of the represented parameter to be associated with the lower end of the scale, in the same units as that parameter. Any value equal or lower than this will be represented with the first color from the palette. If left undefined, the lowest value in the input data will be used.

X-Path	/GMT_Configuration/Map/Picture/Scale/Maximum
Type	Real
Occurrences	0 or 1 **Optional**
Units	Those of the selected parameter.
Default value	*None*
Format	Any rational number in decimal form.
Description	Value of the represented parameter to be associated with the highest end of the scale, in the same units as that parameter. Any value equal or higher than this will be represented with the last color from the palette. If left undefined, the highest value in the input data will be used.

X-Path	/GMT_Configuration/Map/Product/Type
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A

Format	See section 5 for the applicable valid values according to the type of the input products.
Description	Type of the SMOS products to be plotted. If products of any other type are present in the input directory, they will be silently ignored by the GMT.

X-Path	/GMT_Configuration/Map/Product/Parameter
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	See section 5 for the applicable valid values according to the type of the input products.
Description	Parameter whose data is to be plotted. Further details on their actual meaning, units and interpretation can be found in the respective product specifications ([AD. 1], [AD. 2]).

X-Path	/GMT_Configuration/Map/Product/Overlap
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	Average
Format	The valid values are: • **Average** Average all the values at that bin or pixel • **Deviation** Standard deviation at that bin or pixel • **Maximum** Maximum value at that bin or pixel • **Minimum** Minimum value at that bin or pixel • **Oldest** Oldest value at that bin or pixel by sensing time • **Latest** Latest value at that bin or pixel by sensing time • **Nearest** The measurement nearest to the target angle
Description	Resolution policy that shall be used when the input products, or filtering of the input products, provide multiple values which fall within a given bin of the applicable grid or, in the case of data not arranged into a grid (i.e. HKTM, L1A and L1B products), on a given pixel. The option "Nearest" is only applicable to L1C non-browse and Faraday rotation ADFs which can be filtered by incidence angle.

X-Path	/GMT_Configuration/Map/Product/Breakpoint
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	Off
Format	The valid values are: • **Off** ASCII Breakpoint shall not be generated • **On** ASCII Breakpoint shall be generated and placed in the output directory
Description	This flag activates the generation of a breakpoint ASCII file containing the DGG grid point ID, latitude and longitude of the DGG grid, number of measurements (counts) used for the computation of the final value

	and the value for each point of the plot. More information is provided in Section 4.5. It is only applicable to maps based on the DGG grid.

X-Path	/GMT_Configuration/Map/Product/Grid
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	DGG
Format	The valid values are: • **DGG** Discrete Global Grid • **DFFG** Discrete Flexible Fine Grid
Description	Grid definition to be used when plotting data from input products based upon the DFFG. In particular, the DGG definition is used by default to geolocate the data parsed from that products, due to the amount of memory required otherwise, but the present parameter allows to override such approach. This parameter is only applicable when DFFG ADFs are used as input.

X-Path	/GMT_Configuration/Map/Product/Filters/Orbit
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	All
Format	The valid values are: • **All** All orbit orientations • **Ascending** Ascending orbit orientation only • **Descending** Descending orbit orientation only
Description	Orbit orientation the products must have in order to be plotted. If a product with an orbit orientation different from the one here specified is encountered, it will be silently ignored.

X-Path	/GMT_Configuration/Map/Product/Filters/Polarization
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	HH(H)
Format	See section 5 for the applicable valid values according to the type of the input products.
Description	Polarization the input data must have in order to be plotted. If data with a polarization different from the one here specified is encountered, it will be silently ignored. This parameter is only significant when L1 products of any kind are used as input.

X-Path	/GMT_Configuration/Map/Product/Filters/Antenna
Type	Integer
Occurrences	0 or 1 **Optional**
Units	N/A

Default value	1
Format	Any integer number in the range [1, 72].
Description	Antenna number the input data must pertain to in order to be plotted. If data from an antenna different from the one here specified is encountered, it will be silently ignored. This parameter is only applicable when receiver temperatures, system temperatures, receiver noise temperatures or PMS voltages are to be plotted out of L1A products (HKTM or calibrated visibility data).

X-Path	/GMT_Configuration/Map/Product/Filters/NIR_Element
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	AB-H
Format	See section 5 for the applicable valid values according to the type of the input products.
Description	NIR element the input data must pertain to in order to be plotted. All data from a NIR element different from the one here specified will be simply ignored. This parameter is only applicable when NIR brightness temperatures or NIR pulse lengths are to be plotted out of L1A products (HKTM or calibrated visibility data).

X-Path	/GMT_Configuration/Map/Product/Filters/Field_of_View
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	All
Format	The valid values are: • **All** All • **Alias_Free** Alias Free • **Extended_Alias_Free** Extended Alias Free • **Border** Border
Description	Field of view the input data must pertain to in order to be plotted. If data from a field of view different from the one here specified is encountered, it will be silently ignored. This parameter is only applicable when L1C products of any kind are used as input.

X-Path	/GMT_Configuration/Map/Product/Filters/Incidence_Angle/Target
Type	Real
Occurrences	0 or 1 **Optional**
Units	Degrees
Default value	42.5
Format	Any rational number in the range [0.0, 90.0].
Description	Target incidence angle for the filtering of the input data. Whenever multiple data for a pixel is found, which falls within the range defined for the incidence angle, the one closest to this target value will be selected if the Incidence_Angle/Average = 0 option is selected or not specified. Any other value is silently discarded. If data is returned from multiple input products, the Overlap option then defines the policy which is applied to these values. If Incidence_Angle/Average = 1 is selected, the target is ignored.

	This parameter is only applicable when Faraday Rotation ADFs or L1C products, but not browse L1C ones, are used as input.

X-Path	/GMT_Configuration/Map/Product/Filters/Incidence_Angle/Minimum
Type	Real
Occurrences	0 or 1 **Optional**
Units	Degrees
Default value	0.0
Format	Any rational number in the range [0.0, 90.0].
Description	Minimum incidence angle for the filtering of the input data. Whenever multiple data for a pixel is found, its incidence angle must be equal or greater than this in order to be considered for further processing. Any other value is silently discarded. This parameter is only applicable when Faraday Rotation ADFs or L1C products, but not browse L1C ones, are used as input.

X-Path	/GMT_Configuration/Map/Product/Filters/Incidence_Angle/Maximum
Type	Real
Occurrences	0 or 1 **Optional**
Units	Degrees
Default value	90.0
Format	Any rational number in the range [0.0, 90.0].
Description	Maximum incidence angle for the filtering of the input data. Whenever multiple data for a pixel is found, its incidence angle must be equal or smaller than this in order to be considered for further processing. Any other value is silently discarded. This parameter is only applicable when Faraday Rotation ADFs or L1C products, but not browse L1C ones, are used as input.

X-Path	/GMT_Configuration/Map/Product/Filters/Incidence_Angle/Average
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	0
Format	The valid values are: • **0** Use the nearest measurement with respect to the target angle. • **1** Average the values of the data within the specified incidence angle range.
Description	When Average = 1, the data within the incidence angle range defined by Maximum and Minimum is averaged for each input product. When Average = 0, the value nearest to the target is selected for each input product. If data is returned from multiple input products, the Overlap option then defines the policy which is applied to these values. This flag is only applicable when Faraday Rotation ADFs or L1C products, but not browse L1C ones, are used as input.

X-Path	/GMT_Configuration/Map/Product/Filters/Fill_Value
Type	Real

Occurrences	0 or 1 **Optional**
Units	Those of the selected parameter
Default value	*None*
Format	Any rational number in decimal form.
Description	In some L2 and ECMWF parameters, a special value (e.g. -999.0) is used to indicate the absence of a valid value. This configuration item is used to specify such a value and, as a consequence, any matching values which are encountered among the input data will be silently ignored. This parameter is only applicable when L2 products or ECMWF ADFs are used as input.

X-Path	/GMT_Configuration/Map/Product/Filters/Map_Number
Type	Integer
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	1
Format	Any integer number in the range [1, 13].
Description	Number of the map to be represented, among those present in an VTEC auxiliary data product. In particular, each of these maps is centered at 00H, 02H, … , 20H, 22H and 00H, respectively. This parameter is only applicable when VTEC ADFs are used as input.

4.1.5 SAMPLE FILE

The following illustrates the minimum valid configuration file which can be provided to the GMT tool:

```
<GMT_Configuration>
        <General>
                <Paths>
                        <Report>/home/smos/gmt/log</Report>
                </Paths>
        </General>
        <Map>
                <Paths>
                        <Input>/home/smos/gmt/input</Input>
                        <Output>/home/smos/gmt/output</Output>
                </Paths>
                <Product>
                        <Type> MIR_OSUDP2</Type>
                        <Parameter>SS1</Parameter>
                </Product>
        </Map>
</GMT_Configuration>
```

A more elaborate example is offered next:

```
<?xml version="1.0" encoding="UTF-8"?>
<GMT_Configuration>
        <General>
                <Paths>
                        <Report>/home/smos/gmt/log</Report>
                </Paths>
        </General>
        <Map>
                <Paths>
                        <Input>/home/smos/gmt/input</Input>
```



```
                <Output>/home/smos/gmt/output</Output>
        </Paths>
        <Picture>
                <Format>PNG</Format>
                <Width>3600</Width>
                <Height>1800</Height>
                <Projection>
                        <Equator>Mercator</Equator>
                        <Poles>Mollweide</Poles>
                </Projection>
                <Center>
                        <Latitude>0.0</Latitude>
                        <Longitude>-75.0</Longitude>
                </Center>
                <Scale>
                        <Palette>25</Palette>
                        <Minimum>0</Minimum>
                        <Maximum>1</Maximum>
                </Scale>
        </Picture>
        <Product>
                <Type>MIR_SC_F1B</Type>
                <Parameter>Sunglint_FOV_Flag</Parameter>
                <Overlap>Maximum</Overlap>
                <Breakpoint>Off</Breakpoint>
                <Filters>
                        <Orbit>Ascending</Orbit>
                        <Polarization>HH</Polarization>
                </Filters>
        </Product>
    </Map>
    <Map>
        <Paths>
                <Input>/home/smos/gmt/input</Input>
                <Output>/home/smos/gmt/output</Output>
        </Paths>
        <Picture>
                <Format>EPS</Format>
                <Width>3600</Width>
                <Height>1800</Height>
                <Projection>
                        <Equator>Aitoff</Equator>
                </Projection>
                <Center>
                        <Latitude>90.0</Latitude>
                        <Longitude>0.0</Longitude>
                </Center>
                <Scale>
                        <Palette>34</Palette>
                </Scale>
        </Picture>
        <Product>
                <Type>TLM_MIRA1A</Type>
                <Parameter>PMS_Voltages</Parameter>
                <Overlap>Oldest</Overlap>
                <Breakpoint>Off</Breakpoint>
                <Filters>
                        <Orbit>All</Orbit>
                        <Polarization>H</Polarization>
                        <Antenna>63</Antenna>
                </Filters>
        </Product>
    </Map>
</GMT_Configuration>
```

4.2 GMT REPORT

4.2.1 GENERAL INFORMATION

After a successful execution, the Global Mapping Tool will generate a report indicating a number of information items which characterize the processing just performed. In particular, these include the lists of input and output files and the configuration parameters, which would suffice to enable the user to reproduce the obtained results at a later time.

4.2.2 TYPE AND SIZE

The GMT reports are formatted as XML files compliant with [RD. 1].

Since the configuration parameters used to generate the maps are included in the report, the size of an individual file may vary depending on the number of map entries defined in the input configuration file. However, an educated guess suggest that the typical report would occupy a few KB at most.

4.2.3 FILENAME

The files containing the GMT reports will be named according to the following pattern:

MM_CCCC_TTTTTTTTT_<instance_id>.FFF

, where:

- **MM** mission identifier, for the SMOS case it shall be always **SM**
- **CCCC** file class, for the GMT tool it shall be always **OPER**
- **TTTTTTTTT** file type, for the GMT reports it shall be always **REP_GMT___**
- **<instance_id>** identifier of the individual instance of the file type
- **FFF** format extension, for the GMT reports it shall be always **xml**

For the GMT reports, the instance ID is defined as:

YYYYMMDDTHHMMSS_CCC

, where:

- **YYYYMMDDTHHMMSS** system time at which the execution of the GMT tool started
- **CCC** file counter, used to make distinction among reports having all other filename fields identical, starting at **001**

4.2.4 STRUCTURE

The following tree illustrates the XML structure of any valid report file:

Element	Type	Occurrences	Default value
GMT_Report	Tag	1	
├─General	Tag	1	
│ ├─File_Type	String	0 or 1	**REP_GMT___**
│ ├─Paths	Tag	1	
│ │ └─Report	String	1	
│ └─Times	Tag	1	

│ ├─Start	String	1	
│ ├─Stop	String	1	
│ └─Elapsed	String	1	
└─Map	Tag	1 or more	
├─Paths	Tag	1	
│ ├─Input	String	1	
│ ├─Output	String	1	
│ └─Logos	String	0 or 1	
├─Files	Tag	1	
│ ├─Config	Tag	1	
│ │ └─Filename	String	1	
│ ├─Input	Tag	1	
│ │ └─Filename	String	0 or more	
│ └─Output	Tag	1	
│ └─Filename	String	0 or more	
├─Picture	Tag	0 or 1	
│ ├─Format	String	0 or 1	**PNG**
│ ├─Width	Integer	0 or 1	**3600**
│ ├─Height	Integer	0 or 1	**1800**
│ ├─Overlay	String	0 or 1	**Low**
│ ├─Labels	String	0 or 1	**None**
│ ├─Projection	Tag	0 or 1	
│ │ ├─Equator	String	0 or 1	**Cylindrical**
│ │ └─Poles	String	0 or 1	**Orthographic**
│ ├─Center	Tag	0 or 1	
│ │ ├─Latitude	Real	0 or 1	**0.0**
│ │ ├─Longitude	Real	0 or 1	**0.0**
│ │ └─Rotation	Real	0 or 1	**0.0**
│ ├─Region	Tag	0 or 1	
│ │ ├─LatitudeMin	Real	0 or 1	**-90.0**
│ │ ├─LatitudeMax	Real	0 or 1	**90.0**
│ │ ├─LongitudeMin	Real	0 or 1	**-180.0**
│ │ └─LongitudeMax	Real	0 or 1	**180.0**
│ └─Scale	Tag	0 or 1	
│ ├─Palette	Integer	0 or 1	**34**
│ ├─Minimum	Real	0 or 1	***None***
│ └─Maximum	Real	0 or 1	***None***
├─Product	Tag	1	
│ ├─Type	String	1	
│ ├─Parameter	String	1	

│ ├─Overlap	String	0 or 1	**Average**
│ ├─Breakpoint	String	0 or 1	**Off**
├─Grid	String	0 or 1	**DGG**
│ └─Filters	Tag	0 or 1	
│ ├─Orbit	String	0 or 1	**All**
│ ├─Polarization	String	0 or 1	**HH(H)**
│ ├─Antenna	Integer	0 or 1	**1**
│ ├─NIR_Element	String	0 or 1	**AB-H**
│ ├─Field_of_View	String	0 or 1	**All**
│ ├─Incidence_Angle	Tag	0 or 1	
│ │ ├─Target	Real	0 or 1	**42.5**
│ │ ├─Minimum	Real	0 or 1	**0.0**
│ │ ├─Maximum	Real	0 or 1	**90.0**
│ │ └─Average	String	0 or 1	**1**
│ ├─Fill_Value	Real	0 or 1	***None***
│ └─Map_Number	Integer	0 or 1	**1**
└─Log	tag	1	
└─Message	String	0 or more	

Table 4-2: GMT report structure

The details of the leaf nodes presented in the XML tree above can be found in the previous section for all those elements which are also encountered in the configuration file. In particular, these will be replicated unchanged in the report. The new leaf nodes introduced in the report are described next:

X-Path	/GMT_Report/General/Times/Start
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	Date and time in ISO 8601 compliant format: • **YYYY-MM-DDTHH:MM:SS.ssssss** where: • **YYYY** Year • **MM** Month • **DD** Day • **HH** Hour • **MM** Minutes • **SS** Seconds • **ssssss** Fraction of a second (i.e. microseconds)
Description	System time at which the execution of the GMT tool started.

X-Path	/GMT_Report/General/Times/Stop
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	Date and time in ISO 8601 compliant format: • **YYYY-MM-DDTHH:MM:SS.ssssss** where: • **YYYY** Year • **MM** Month • **DD** Day • **HH** Hour • **MM** Minutes • **SS** Seconds • **ssssss** Fraction of a second (i.e. microseconds)
Description	System time at which the execution of the GMT tool finished.

X-Path	/GMT_Report/General/Times/Elapsed
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	Time interval in ISO 8601 compliant format: • **PYYYY-MM-DDTHH:MM:SS.ssssss** where: • **YYYY** Year • **MM** Month • **DD** Day • **HH** Hour • **MM** Minutes • **SS** Seconds • **ssssss** Fraction of a second (i.e. microseconds)
Description	Elapsed real time between the start of the GMT tool and its termination.

X-Path	/GMT_Report/Map/Files/Config/Filename
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	UNIX path

Description	Path to the configuration file from which the various parameters included in the report, and used during that particular GMT run, where taken.

X-Path	/GMT_Report/Map/Files/Input/Filename
Type	String
Occurrences	0 or more **Optional**
Units	N/A
Default value	N/A
Format	UNIX path
Description	Path to each of the SMOS products used as input for the generation of the map set covered by the present "map" entry. Note that this node may be absent if no products of the appropriate type were found at the input directory.

X-Path	/GMT_Report/Map/Files/Output/Filename
Type	String
Occurrences	0 or more **Optional**
Units	N/A
Default value	N/A
Format	UNIX path
Description	Path to each of the output files generated as a result of that particular GMT run, with the configuration parameters indicated. Note that this node may be absent if no products of the appropriate type were found at the input directory.

X-Path	/GMT_Report/Map/Log/Message
Type	String
Occurrences	0 or more **Optional**
Units	N/A
Default value	N/A
Format	Free text, except for the absence of less-than ("<") and greater-than (">") characters. The element may optionally contain an attribute, "type", indicating the severity of the message. In case of absence, the message is assumed to be informative. The valid values are: • **info** Informative message • **warning** Warning message • **error** Error message
Description	Message generated by the GMT software during the generation of the maps associated with this entry. Such elements may contain warnings, errors and / or informative statements.

4.2.5 SAMPLE FILE

A sample report is offered next, based upon a real execution of the software:

```
<?xml version="1.0" encoding="UTF-8" standalone="no" ?>
<GMT_Report>

        <General>
```

```
		<File_Type>REP_GMT_1_</File_Type>
		<Paths>
			<Report>output</Report>
		</Paths>
		<Times>
			<Start>2013-12-22T17:59:49.591775</Start>
			<Stop>2013-12-22T18:00:41.338696</Stop>
			<Elapsed>P0000-00-00T00:00:51.746921</Elapsed>
		</Times>
	</General>

	<Map>
		<Paths>
			<Input>input</Input>
			<Output>output</Output>
		</Paths>
		<Files>
			<Config>
				<Filename>config/test01.xml</Filename>
			</Config>
			<Input>
				<Filename>input/SM_TEST_MIR_SCSD1C_20070223T062146_20070223T070523_001_00
				1_0</Filename>
			</Input>
			<Output>
				<Filename>output/x86_64/SM_OPER_MIR_SCXD1C_20131222T175949_BT-
				VALUE_20070223T062146_20070223T070523_ALL_N_001.png</Filename>
				<Filename>output/x86_64/SM_OPER_MIR_SCXD1C_20131222T175949_BT-
				VALUE_20070223T062146_20070223T070523_ALL_S_001.png</Filename>
				<Filename>output/x86_64/SM_OPER_MIR_SCXD1C_20131222T175949_BT-
				VALUE_20070223T062146_20070223T070523_ALL_O_001.png</Filename>
			</Output>
		</Files>
		<Product>
			<Type>MIR_SCXD1C</Type>
			<Parameter>BT_Value</Parameter>
			<Overlap>Average</Overlap>
			<Breakpoint>Off</Breakpoint>
			<Filters>
				<Polarization>HHH</Polarization>
				<Field_of_View>All</Field_of_View>
				<Incidence_Angle>
					<Target>42.5</Target>
					<Minimum>15.0</Minimum>
					<Maximum>60.0</Maximum>
					<Average>0</Average>
				</Incidence_Angle>
			</Filters>
		</Product>
		<Log>
			<Message type="info"> Information : (22-DEC-2013 17:59:53) SMOSGMT 5775 :
			Generation of map 1 started</Message>
			<Message type="info"> Information : (22-DEC-2013 18:00:24) SMOSGMT 5775 : Product
			open: SM_TEST_MIR_SCSD1C_20070223T062146_20070223T070523_001_001_0</Message>
			<Message type="info"> Information : (22-DEC-2013 18:00:39) SMOSGMT 5775 : New map
			created: output/x86_64/SM_OPER_MIR_SCXD1C_20131222T175949_BT-
			VALUE_20070223T062146_20070223T070523_ALL_N_001.png</Message>
			<Message type="info"> Information : (22-DEC-2013 18:00:40) SMOSGMT 5775 : New map
			created: output/x86_64/SM_OPER_MIR_SCXD1C_20131222T175949_BT-
			VALUE_20070223T062146_20070223T070523_ALL_S_001.png</Message>
			<Message type="info"> Information : (22-DEC-2013 18:00:41) SMOSGMT 5775 : New map
			created: output/x86_64/SM_OPER_MIR_SCXD1C_20131222T175949_BT-
			VALUE_20070223T062146_20070223T070523_ALL_O_001.png</Message>
			<Message type="info"> Information : (22-DEC-2013 18:00:41) SMOSGMT 5775 :
			Generation of map 1 succesful</Message>
		</Log>
	</Map>

</GMT_Report>
```

4.3 GMT MAPS

4.3.1 GENERAL INFORMATION

After a successful execution, the Global Mapping Tool will generate a set of images matching the instructions given in the configuration file. These will consist on annotated global maps where the selected variable from the SMOS products taken as input is plot. While a map will show data from a single variable, it is possible to draw in a single map the data for that variable as read from several input files. Also, the way the data is plotted will depend on the input product type, distinguishing between those which contain data arranged in a grid, and those which don't.

For each set of configuration parameters which determine a map to be plotted, three different files will be produced by the software. The first of these will contain the expected map, centred at the indicated origin and drawn using the requested projection for the equator. The remaining two will contain plots which share all characteristics but the projection with the first map, which will be centred at the north and south pole respectively.

4.3.2 TYPE AND SIZE

The GMT maps can be written using any of the following graphical formats, depending on the appropriate configuration parameter. The size indicated next to each of them indicates the average size to be expected for a map plotted using the default resolution (3600 x 1800 pixels):

- EPS 18 MB
- JPEG 600 KB
- PNG 400 KB

4.3.3 FILENAME

The files containing the GMT maps will be named according to the following pattern:

MM_CCCC_TTTTTTTTT_<instance_id>.FFF

, where:

- **MM** mission identifier, for the SMOS case it shall be always **SM**
- **CCCC** file class, for the GMT tool it shall be always **OPER**
- **TTTTTTTTT** file type, indicating that of the input products:
  - **TLM_MIRA1A** L1A HKTM data
  - **MIR_SC_D1A** L1A Dual Polarization Calibrated Visibilities
  - **MIR_SC_F1A** L1A Full Polarization Calibrated Visibilities
  - **MIR_SCND1A** NRT L1A Dual Polarization Calibrated Visibilities
  - **MIR_SCNF1A** NRT L1A Full Polarization Calibrated Visibilities
  - **MIR_SC_D1B** L1B Dual Polarization Reconstructed $\check{T}_B$ Fourier Components
  - **MIR_SC_F1B** L1B Full Polarization Reconstructed $\check{T}_B$ Fourier Components
  - **MIR_SCND1B** NRT L1B Dual Polarization Reconstructed $\check{T}_B$ Fourier Components
  - **MIR_SCNF1B** NRT L1B Full Polarization Reconstructed $\check{T}_B$ Fourier Components
  - **MIR_BWXD1C** L1C Browse $\check{T}_B$ in Dual Polarization
  - **MIR_BWXF1C** L1C Browse $\check{T}_B$ in Full Polarization

  - **MIR_BWND1C** NRT L1C Browse $\check{T}_B$ in Dual Polarization
  - **MIR_BWNF1C** NRT L1C Browse $\check{T}_B$ in Full Polarization
  - **MIR_SCXD1C** L1C Dual Polarization Reconstructed $\check{T}B$ Swath
  - **MIR_SCXF1C** L1C Full Polarization Reconstructed $\check{T}B$ Swath
  - **MIR_SCND1C** L1C Dual Polarization Reconstructed $\check{T}B$ Swath
  - **MIR_SCNF1C** L1C Full Polarization Reconstructed $\check{T}B$ Swath
  - **MIR_OSDAP2** L2 Ocean Salinity Data Analysis Products
  - **MIR_OSUDP2** L2 Ocean Salinity User Data Products
  - **MIR_SMDAP2** L2 Soil Moisture Data Analysis Products
  - **MIR_SMUDP2** L2 Soil Moisture User Data Products
  - **AUX_VTEC_X** VTEC Maps
  - **AUX_ECMWF_** ECMWF Products
  - **AUX_DFFFRA** DFFG Fractions Products
  - **AUX_DFFLAI** DFFG Leaf Area Index Products
  - **AUX_DFFLMX** DFFG LAI Maximum Products
  - **AUX_DGGROU** DGG Current Roughness H Products
  - **AUX_DGGRFI,** DGG Current RFI Products
  - **AUX_DFFSNO (SM V600 baseline)** DFFG Snow Products
  - **AUX_DFFSOI (SM V600 baseline)** DFFG Soil Properties Products
  - **AUX_DGGTLV** DGG Current Tau Nadir LV Products
  - **AUX_DGGTFO** DGG Current Tau Nadir FO Products
  - **AUX_GALAXY** Original L-Band Galaxy Maps
  - **AUX_GALNIR** L1 L-Band Galaxy Maps
  - **AUX_FARA_X** Faraday Rotation Products
- **<instance_id>** identifier of the individual instance of the file type
- **FFF** format extension, either:
  - **eps** Encapsulated postscript
  - **jpg** Joint Photographic Experts Group
  - **png** Portable Network Graphics

For the GMT maps, the instance ID is defined as:

YYYYMMDDTHHMMSS_PPP…P_yyyymmddThhmmss_YYYYMMDDTHHMMSS_OOO_R_CCC

, where:

- **YYYYMMDDTHHMMSS** system time at which the execution of the GMT tool started
- **PPP…P** parameter name represented in the plot:
  - Valid values are those listed for the parameter selection in configuration files, replacing existing underscores ("_") by dashes ("-"), and converting the text to uppercase.
- **yyyymmddThhmmss** earliest sensing start time of the input data, based on filename
- **YYYYMMDDTHHMMSS** latest sensing stop time of the input data, based on filename

- **OOO** orbit orientation of the data represented:
  - **ASC** ascending orbit
  - **DES** descending orbit
  - **ALL** both orbit orientations
- **R** map center, either:
  - **O** Origin (e.g. given coordinates)
  - **N** North Pole
  - **S** South Pole
- **CCC** file counter, used to make distinction among products having all other filename fields identical, starting at **001**

4.3.4 STRUCTURE

The structure of the image files are defined by the respective standards of the formats supported. In case of need, please refer to [RD. 2], [RD. 3] and [RD. 4] for a formal specification.

4.3.5 SAMPLE FILE

An example of the three pictures generated for a given GMT map is offered here.

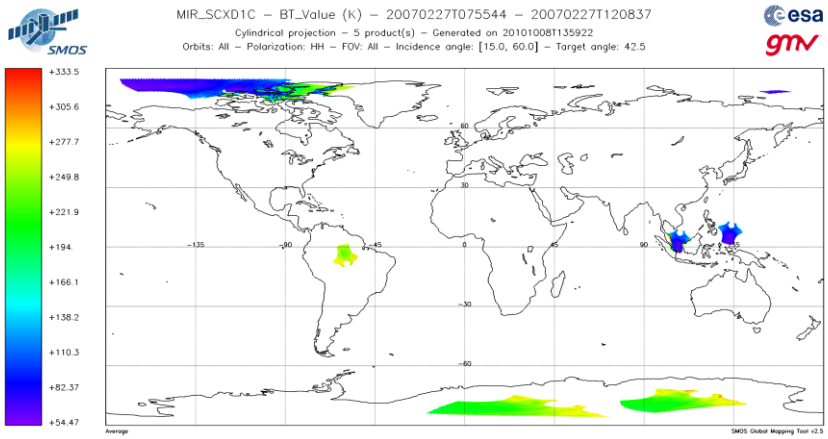

Figure 4-1: SM_OPER_MIR_SCXD1C_20101008T135922_BT-VALUE_20070227T075544_20070227T120837_ALL_O_001.png

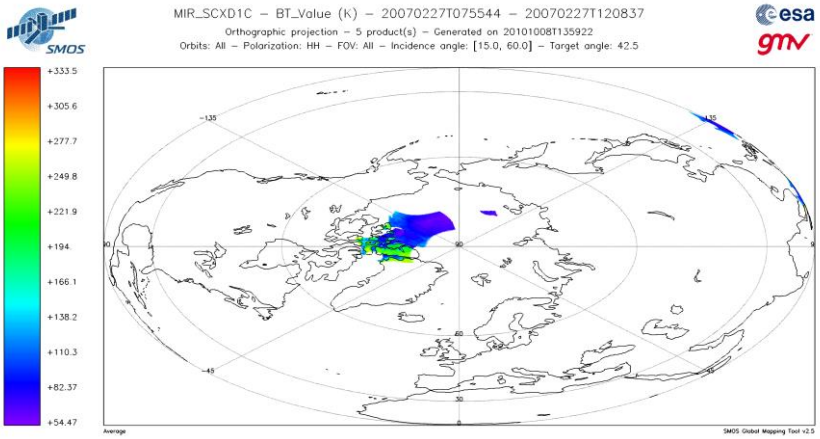

Figure 4-2: SM_OPER_MIR_SCXD1C_20101008T135922_BT-VALUE_20070227T075544_20070227T120837_ALL_N_001.png

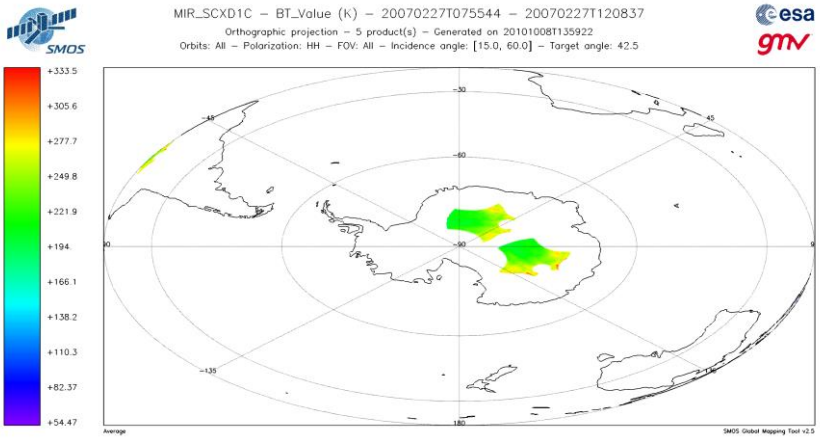

Figure 4-3: SM_OPER_MIR_SCXD1C_20101008T135922_BT-VALUE_20070227T075544_20070227T120837_ALL_S_001.png

4.4 LOG MESSAGES

4.4.1 GENERAL INFORMATION

During its execution, the Global Mapping Tool will generate a number of log messages which will be shown to the user through the console. As mentioned before, the SMOS GMT software may eventually be integrated with the SMOS Monitoring Facility, which implies that the former shall comply with the specifications defined for the command line interface with External Tools to the MF. Among other things, these specifications dictate how the log messages shall be formatted by the application, and therefore the format here described strictly follows that presented in section 5.3 of the applicable document ([AD. 3]).

4.4.2 TYPE AND SIZE

Log messages are written to the standard output of the Global Mapping Tool process. When integrated with the SMOS Monitoring Facility, the MF core will catch and redirect them into its own log system.

Each message is composed of a single line of text, with no carriage returns or line feeds on it. According to the format described below, the size of each message is restricted to a maximum of 310 bytes.

4.4.3 FILENAME

N/A

4.4.4 STRUCTURE

Log messages shall conform to the following structure:

logLevel : (DD-MMM-YYYY hh:mm:ss) toolboxId PID : logMessage

, where:

- **logLevel** importance level, represented by one of the following strings:
  - **" Information"** informative messages
  - **" Warning ! "** warning messages
  - **" Error !!! "** error messages
- **(DD-MMM-YYYY hh:mm:ss)** time and date when the message is generated:
  - **DD** day
  - **MMM** first three letters of the month name in English (uppercase)
  - **YYYY** year
  - **hh** hour
  - **mm** minutes
  - **ss** seconds
- **toolboxId** MF toolbox function generating the log messages, fixed to:
  - **SMOSGMT** Global Mapping Tool identifier
- **PID** process ID
- **logMessage** actual message, with a maximum length of 256 characters.

Regarding the log levels, please note there are some blanks in the fixed strings defined, to make them 12 characters long. Also, time and date elements have a fixed length too, and are padded with zeros as needed to reach the appropriate number of digits.

4.4.5 SAMPLE FILE

An example of the log messages written to the standard output is offered next, based upon a real execution of the software:

```
 Information : (22-DEC-2013 17:58:51) SMOSGMT 5763 : SMOS Global Mapping Tool started
 Information : (22-DEC-2013 17:58:51) SMOSGMT 5763 : Configuration file loaded: config/test01.xml
 Information : (22-DEC-2013 17:58:51) SMOSGMT 5763 : Product open:
SM_TEST_AUX_DGG____20070101T000000_20781231T235959_000_001_0
 Information : (22-DEC-2013 17:58:55) SMOSGMT 5763 : Generation of map 1 started
 Information : (22-DEC-2013 17:59:28) SMOSGMT 5763 : Product open:
SM_TEST_MIR_SCSD1C_20070223T062146_20070223T070523_001_001_0
 Information : (22-DEC-2013 17:59:47) SMOSGMT 5763 : New map created:
SM_OPER_MIR_SCXD1C_20131222T175851_BT-VALUE_20070223T062146_20070223T070523_ALL_N_001.png
 Information : (22-DEC-2013 17:59:48) SMOSGMT 5763 : New map created:
SM_OPER_MIR_SCXD1C_20131222T175851_BT-VALUE_20070223T062146_20070223T070523_ALL_S_001.png
 Information : (22-DEC-2013 17:59:48) SMOSGMT 5763 : New map created:
SM_OPER_MIR_SCXD1C_20131222T175851_BT-VALUE_20070223T062146_20070223T070523_ALL_O_001.png
 Information : (22-DEC-2013 17:59:48) SMOSGMT 5763 : Generation of map 1 succesful
 Information : (22-DEC-2013 17:59:48) SMOSGMT 5763 : New GMT report generated:
SM_OPER_REP_GMT____20131222T175851_001.xml
 Information : (22-DEC-2013 17:59:49) SMOSGMT 5763 : New MF report generated:
SM_MREP_REP_GMT_1__20070223T062146_20070223T070523_0001.zip
 Information : (22-DEC-2013 17:59:49) SMOSGMT 5763 : SMOS Global Mapping Tool successfully finished
```

4.5 OPTIONAL BREAKPOINT FILE

4.5.1 GENERAL INFORMATION

If selected in the configuration of the tool, an ASCII breakpoint file will be produced, containing information about each map. For each DGG grid ID point, the latitude and longitude, the number of measurements (counts) used in the computation of the value and the value of the plotted parameter will be output in this file.

4.5.2 TYPE AND SIZE

The breakpoint file will be output as a plain text file, .txt and will typically be of less than 100MB.

4.5.3 FILENAME

The files containing the ASCII breakpoint information will be named according to the following pattern:

MM_CCCC_TTTTTTTTTT_<instance_id>.txt

, where:

- **MM** mission identifier, for the SMOS case it shall be always **SM**
- **CCCC** file class, for the GMT tool it shall be always **OPER**
- **TTTTTTTTTT** file type, indicating that of the input products:
  - **MIR_BWXD1C** L1C Browse $\check{T}_B$ in Dual Polarization
  - **MIR_BWXF1C** L1C Browse $\check{T}_B$ in Full Polarization
  - **MIR_BWND1C** NRT L1C Browse $\check{T}_B$ in Dual Polarization
  - **MIR_BWNF1C** NRT L1C Browse $\check{T}_B$ in Full Polarization
  - **MIR_SCXD1C** L1C Dual Polarization Reconstructed $\check{T}$B Swath
  - **MIR_SCXF1C** L1C Full Polarization Reconstructed $\check{T}$B Swath
  - **MIR_SCND1C** NRT L1C Dual Polarization Reconstructed $\check{T}$B Swath
  - **MIR_SCNF1C** NRT L1C Full Polarization Reconstructed $\check{T}$B Swath
  - **MIR_OSDAP2** L2 Ocean Salinity Data Analysis Products
  - **MIR_OSUDP2** L2 Ocean Salinity User Data Products
  - **MIR_SMDAP2** L2 Soil Moisture Data Analysis Products
  - **MIR_SMUDP2** L2 Soil Moisture User Data Products
  - **AUX_VTEC_X** VTEC Maps
  - **AUX_ECMWF_** ECMWF Products
  - **AUX_DFFFRA** DFFG Fractions Products
  - **AUX_DFFLAI** DFFG Leaf Area Index Products
  - **AUX_DFFLMX** DFFG LAI Maximum Products
  - **AUX_DGGTLV** DGG Current Tau Nadir LV Products
  - **AUX_DGGTFO** DGG Current Tau Nadir FO Products
  - **AUX_DGGROU** DGG Current ROUGHNESS H Products
  - **AUX_DGGRFI,** DGG Current RFI Products
  - **AUX_DFFSNO (SM V600 baseline)** DFFG Snow Products

  - **AUX_DFFSOI (SM V600 baseline)** DFFG Soil PROPERTIES Products
  - **AUX_GALAXY** Original L-Band Galaxy Maps
  - **AUX_GALNIR** L1 L-Band Galaxy Maps
  - **AUX_FARA_X** Faraday Rotation Products
- **<instance_id>** identifier of the individual instance of the file type

For the GMT breakpoint file, the instance ID is defined as:

YYYYMMDDTHHMMSS_BP_PPP…P_OOO_ZZ(Z)

, where:

- **YYYYMMDDTHHMMSS** system time at which the file was created
- **BP** indicates it is a breakpoint file
- **PPP…P** name of the parameter represented in the plot:
  - Valid values are those listed for the parameter selection in configuration files.
- **OOO** orbit orientation of the data represented:
  - **Asc** ascending orbit
  - **Des** descending orbit
  - **All** both orbit orientations
- **ZZ(Z)** polarization of data represented:
  - **HH**
  - **VV**
  - **HV**
  - **HHV**

4.5.4 STRUCTURE

The data is arranged in a tabular fomat with the following headings:

- grid_id – identifier of each grid cell
- lat – latitude of the grid points
- lon – longitude of the grid points
- counts – number of measurements used to calculate the parameter's value
- value – value of the plotted parameter

4.5.5 SAMPLE FILE

The following shows the first few lines of a sample file.

```
grid_id lat     lon     counts  value
7155142 -84.310997009277        -175.022003173828       1       196.862686157227
7155143 -84.334999084473        -172.526000976562       1       184.829574584961
7155144 -84.359001159668        3.654000043869  1       187.909347534180
```

5 SUPPORTED INPUT PRODUCTS

5.1 SMOS L1A HKTM

5.1.1 GENERAL INFORMATION

The TLM_MIRA1A data is generated from the data contained in the ancillary packets of the TLM_MIRA0_ product. A dataset record is generated for each integration time (every 1.2 seconds). The TLM_MIRA1A product acts as a supporting product presenting a single source for the instrument status monitoring measurements and spacecraft position and attitude data, so that it is not replicated in all products. This product does not contain information extracted from the PUS HKTM X-Band packets or PUS S-band packets.

The measurements in this product are obtained in parallel with MIRAS correlation measurements, i.e. there shall be one data set record of TLM_MIRA1A for each integration time, captured in parallel with correlation measurements whichever the type (correlated noise injection, uncorrelated noise injection, dual polarization and full polarization measurements).

5.1.2 TYPE AND SIZE

The following SMOS file types are addressed when referring to L1A HKTM products, with their typical size indicated next to each entry:

- TLM_MIRA1A 4,27 MB

5.1.3 FILENAME

The naming convention for SMOS L1A HKTM files is described in detail in [AD. 1].

5.1.4 STRUCTURE

The structure of the SMOS L1A HKTM files is elaborated in [AD. 1]. Please refer to this document as the main source for information regarding these files.

5.1.5 GMT CONFIGURATION

In addition to the general parameters which can be defined within a map entry, as part of a GMT configuration file, the following filters are applicable when plotting L1A HKTM products:

- Orbit Orbit orientation
- Polarization Polarization mode
- Antenna Antenna number (certain parameters only)
- NIR_element NIR element (certain parameters only)

In particular, the details on these, along with the appropriate values for the product type, the parameter to be plotted, and the overlap resolution policy, are provided below:

X-Path	/GMT_Configuration/Map/Product/Type
Type	String
Occurrences	1 **Required**
Units	N/A

Default value	N/A
Format	The valid values for this type of product (TLM_MIRA1A) are: • **TLM_MIRA1A** L1A HKTM data
Description	Type of the SMOS products to be plotted. If products of any other type are present in the input directory, they will be silently ignored by the GMT.

X-Path	/GMT_Configuration/Map/Product/Parameter
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (TLM_MIRA1A) are: • **PMS_Voltages** PMS voltages • **NIR_Pulse_Length** NIR pulse length • **Correlated_Noise_Mode** Correlated noise injection operation mode
Description	Parameter whose data is to be plotted. Further details on their actual meaning, units and interpretation can be found in the respective product specifications ([AD. 1], [AD. 2]).

X-Path	/GMT_Configuration/Map/Product/Overlap
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	Average
Format	The valid values are: • **Average** Average all the values at that pixel • **Deviation** Standard deviation at that pixel • **Maximum** Maximum value at that pixel • **Minimum** Minimum value at that pixel • **Oldest** Oldest value at that pixel by sensing time • **Latest** Latest value at that pixel by sensing time
Description	Resolution policy that shall be used when more than a single value falls on a given pixel.

X-Path	/GMT_Configuration/Map/Product/Filters/Orbit
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	All
Format	The valid values are: • **All** All orbit orientations • **Ascending** Ascending orbit orientation only

	• **Descending** Descending orbit orientation only
Description	Orbit orientation the products must have in order to be plotted. If a product with an orbit orientation different from the one here specified is encountered, it will be silently ignored.

X-Path	/GMT_Configuration/Map/Product/Filters/Polarization
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	HH(H)
Format	The valid values for this type of product (TLM_MIRA1A) are: • **H** Selected antenna in H polarization • **V** Selected antenna in V polarization
Description	Polarization the input data must have in order to be plotted. If data with a polarization different from the one here specified is encountered, it will be silently ignored. This parameter is only significative when PMS voltages are to be plotted out of HKTM data.

X-Path	/GMT_Configuration/Map/Product/Filters/Antenna
Type	Integer
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	1
Format	Any integer number in the range [1, 72].
Description	Antenna number the input data must pertain to in order to be plotted. If data from an antenna different from the one here specified is encountered, it will be silently ignored. This parameter is only significative when PMS voltages are to be plotted out of HKTM data.

X-Path	/GMT_Configuration/Map/Product/Filters/NIR_Element
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	AB-H
Format	The valid values for this type of product (TLM_MIRA1A) are: • **AB-H** • **AB-V** • **BC-H** • **BC-V** • **CA-H** • **CA-V**
Description	NIR element the input data must pertain to in order to be plotted. All data from a NIR element different from the one here specified will be simply ignored. This parameter is only significative when NIR pulse lengths are to be plotted out of HKTM data.

5.2 SMOS L1A DUAL POLARIZATION CALIBRATED VISIBILITIES

5.2.1 GENERAL INFORMATION

The L1A products comprise data obtained in science measurement mode (either pointing to the Earth –nominal- or to external sources - i.e. deep Sky, Moon…-) in both dual and full polarisation. There is a unique type of product, as it contains the calibrated visibilities between receivers, before any reconstruction is applied. These products present these calibrated visibilities in a known array, so that the reconstruction process may reorder and apply the reconstruction algorithm as needed.

The dual polarization calibrated visibilities are obtained after converting the dual polarization L0 science packets into raw correlations and calibrating them. MIR_SC_D1A products contain reformatted, unpacked and calibrated complex correlations coming from L0 data, combined per integration time and including all redundant visibilities.

5.2.2 TYPE AND SIZE

The following SMOS file types are addressed when referring to L1A Dual Polarization products, with their typical size indicated next to each entry:

- MIR_SC_D1A 107 MB

5.2.3 FILENAME

The naming convention for SMOS L1A products is described in detail in [AD. 1].

5.2.4 STRUCTURE

The structure of the SMOS L1A products is elaborated in [AD. 1]. Please refer to this document as the main source for information regarding these files.

5.2.5 GMT CONFIGURATION

In addition to the general parameters which can be defined within a map entry, as part of a GMT configuration file, the following filters are applicable when plotting L1A Dual Polarization products:

- Orbit Orbit orientation
- Polarization Polarization mode
- Antenna Antenna number (certain parameters only)
- NIR_element NIR element (certain parameters only)

In particular, the details on these, along with the appropriate values for the product type, the parameter to be plotted, and the overlap resolution policy, are provided below:

X-Path	/GMT_Configuration/Map/Product/Type
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (MIR_SC_D1A) are:

	• **MIR_SC_D1A** L1A Dual Polarization Calibrated Visibilities
Description	Type of the SMOS products to be plotted. If products of any other type are present in the input directory, they will be silently ignored by the GMT.

X-Path	/GMT_Configuration/Map/Product/Parameter
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (MIR_SC_D1A) are: • **Receiver_Temp** Receiver temperature • **Sys_Temp** System temperature • **Receiver_Noise_Temp** Receiver noise temperature • **NIR_Brightness_Temp** NIR brightness temperature • **LICEF_ Brightness_Temp** LICEF brightness temperature • **Max_Mkj_module** Max. module of the normalized quadrature corrected correlation
Description	Parameter whose data is to be plotted. Further details on their actual meaning, units and interpretation can be found in the respective product specifications ([AD. 1], [AD. 2]).

X-Path	/GMT_Configuration/Map/Product/Overlap
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	Average
Format	The valid values are: • **Average** Average all the values at that pixel • **Deviation** Standard deviation at that pixel • **Maximum** Maximum value at that pixel • **Minimum** Minimum value at that pixel • **Oldest** Oldest value at that pixel by sensing time • **Latest** Latest value at that pixel by sensing time
Description	Resolution policy that shall be used when more than a single value falls on a given pixel.

X-Path	/GMT_Configuration/Map/Product/Filters/Orbit
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	All

Format	The valid values are: • **All** All orbit orientations • **Ascending** Ascending orbit orientation only • **Descending** Descending orbit orientation only
Description	Orbit orientation the products must have in order to be plotted. If a product with an orbit orientation different from the one here specified is encountered, it will be silently ignored.

X-Path	/GMT_Configuration/Map/Product/Filters/Polarization
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	HH(H)
Format	The valid values for this type of product (MIR_SC_D1A) depend on the parameter selected: *Receiver_Temp / Sys_Temp / Receiver_Noise_Temp:* • **H** Selected antenna in H polarization • **V** Selected antenna in V polarization *Max_Mkj_module* • **All** Arms in any polarization • **HHH** Arms in HHH polarization • **VVV** Arms in VVV polarization
Description	Polarization the input data must have in order to be plotted. If data with a polarization different from the one here specified is encountered, it will be silently ignored.

X-Path	/GMT_Configuration/Map/Product/Filters/Antenna
Type	Integer
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	1
Format	Any integer number in the range [1, 72].
Description	Antenna number the input data must pertain to in order to be plotted. If data from an antenna different from the one here specified is encountered, it will be silently ignored. This parameter is only significative when receiver temperatures, system temperatures, or receiver noise temperatures are to be plotted out of L1A calibrated visibility data.

X-Path	/GMT_Configuration/Map/Product/Filters/NIR_Element
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	AB-H
Format	The valid values for this type of product (MIR_SC_D1A) are:

	• **AB-H** • **AB-V** • **AB-T3** • **AB-T4** • **BC-H** • **BC-V** • **BC-T3** • **BC-T4** • **CA-H** • **CA-V** • **CA-T3** • **CA-T4**
Description	NIR element the input data must pertain to in order to be plotted. All data from a NIR element different from the one here specified will be simply ignored. This parameter is only significative when NIR brightness temperatures are to be plotted out of L1A calibrated visibility data.

5.3 SMOS L1A FULL POLARIZATION CALIBRATED VISIBILITIES

5.3.1 GENERAL INFORMATION

The L1A products comprise data obtained in science measurement mode (either pointing to the Earth –nominal- or to external sources - i.e. deep Sky, Moon…-) in both dual and full polarisation. There is a unique type of product, as it contains the calibrated visibilities between receivers, before any reconstruction is applied. These products present these calibrated visibilities in a known array, so that the reconstruction process may reorder and apply the reconstruction algorithm as needed.

The full polarization calibrated visibilities are obtained after converting the full polarization L0 science packets into raw correlations and calibrating them. MIR_SC_F1A products contain one set of complete visibilities for each snapshot.

5.3.2 TYPE AND SIZE

The following SMOS file types are addressed when referring to L1A Full Polarization products, with their typical size indicated next to each entry:

- MIR_SC_F1A 214 MB

5.3.3 FILENAME

The naming convention for SMOS L1A products is described in detail in [AD. 1].

5.3.4 STRUCTURE

The structure of the SMOS L1A products is elaborated in [AD. 1]. Please refer to this document as the main source for information regarding these files.

5.3.5 GMT CONFIGURATION

In addition to the general parameters which can be defined within a map entry, as part of a GMT configuration file, the following filters are applicable when plotting L1A Full Polarization products:

- Orbit Orbit orientation
- Polarization Polarization mode
- Antenna Antenna number (certain parameters only)
- NIR_element NIR element (certain parameters only)

In particular, the details on these, along with the appropriate values for the product type, the parameter to be plotted, and the overlap resolution policy, are provided below:

X-Path	/GMT_Configuration/Map/Product/Type
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (MIR_SC_F1A) are:

	• **MIR_SC_F1A** L1A Full Polarization Calibrated Visibilities
Description	Type of the SMOS products to be plotted. If products of any other type are present in the input directory, they will be silently ignored by the GMT.

X-Path	/GMT_Configuration/Map/Product/Parameter
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (MIR_SC_F1A) are: • **Receiver_Temp** Receiver temperature • **Sys_Temp** System temperature • **Receiver_Noise_Temp** Receiver noise temperature • **NIR_Brightness_Temp** NIR brightness temperature • **LICEF_ Brightness_Temp** LICEF brightness temperature • **Max_Mkj_module** Max. module of the normalized quadrature corrected correlation
Description	Parameter whose data is to be plotted. Further details on their actual meaning, units and interpretation can be found in the respective product specifications ([AD. 1], [AD. 2]).

X-Path	/GMT_Configuration/Map/Product/Overlap
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	Average
Format	The valid values are: • **Average** Average all the values at that pixel • **Deviation** Standard deviation at that pixel • **Maximum** Maximum value at that pixel • **Minimum** Minimum value at that pixel • **Oldest** Oldest value at that pixel by sensing time • **Latest** Latest value at that pixel by sensing time
Description	Resolution policy that shall be used when more than a single value falls on a given pixel.

X-Path	/GMT_Configuration/Map/Product/Filters/Orbit
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	All
Format	The valid values are:

	• **All** All orbit orientations • **Ascending** Ascending orbit orientation only • **Descending** Descending orbit orientation only
Description	Orbit orientation the products must have in order to be plotted. If a product with an orbit orientation different from the one here specified is encountered, it will be silently ignored.

X-Path	/GMT_Configuration/Map/Product/Filters/Polarization
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	HH(H)
Format	The valid values for this type of product (MIR_SC_F1A) depend on the parameter selected: *Receiver_Temp / Sys_Temp / Receiver_Noise_Temp:* • **H** Selected antenna in H polarization • **V** Selected antenna in V polarization *Max_Mkj_module* • **All** Arms in any polarization • **HHH** Arms in HHH polarization • **HVV** Arms in HVV polarization • **VHV** Arms in VHV polarization • **VVH** Arms in VVH polarization • **VVV** Arms in VVV polarization • **VHH** Arms in VHH polarization • **HVH** Arms in HVH polarization • **HHV** Arms in HHV polarization
Description	Polarization the input data must have in order to be plotted. If data with a polarization different from the one here specified is encountered, it will be silently ignored.

X-Path	/GMT_Configuration/Map/Product/Filters/Antenna
Type	Integer
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	1
Format	Any integer number in the range [1, 72].
Description	Antenna number the input data must pertain to in order to be plotted. If data from an antenna different from the one here specified is encountered, it will be silently ignored. This parameter is only significative when receiver temperatures, system temperatures, or receiver noise temperatures are to be plotted out of L1A calibrated visibility data.

X-Path	/GMT_Configuration/Map/Product/Filters/NIR_Element

Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	AB-H
Format	The valid values for this type of product (MIR_SC_F1A) are: • **AB-H** • **AB-V** • **AB-T3** • **AB-T4** • **BC-H** • **BC-V** • **BC-T3** • **BC-T4** • **CA-H** • **CA-V** • **CA-T3** • **CA-T4**
Description	NIR element the input data must pertain to in order to be plotted. All data from a NIR element different from the one here specified will be simply ignored. This parameter is only significative when NIR brightness temperatures are to be plotted out of L1A calibrated visibility data.

5.4 SMOS NRT L1A DUAL POLARIZATION CALIBRATED VISIBILITIES

5.4.1 GENERAL INFORMATION

The L1A products comprise data obtained in science measurement mode (either pointing to the Earth –nominal- or to external sources - i.e. deep Sky, Moon…-) in both dual and full polarisation. There is a unique type of product, as it contains the calibrated visibilities between receivers, before any reconstruction is applied. These products present these calibrated visibilities in a known array, so that the reconstruction process may reorder and apply the reconstruction algorithm as needed.

The dual polarization calibrated visibilities are obtained after converting the dual polarization L0 science packets into raw correlations and calibrating them. MIR_SCND1A products contain reformatted, unpacked and calibrated complex correlations coming from L0 data, combined per integration time and including all redundant visibilities. NRTP only generates this type of data upon specific request and for validation purposes.

5.4.2 TYPE AND SIZE

The following SMOS file types are addressed when referring to NRT L1A Dual Polarization products, with their typical size indicated next to each entry:

- MIR_SCND1A 107 MB

5.4.3 FILENAME

The naming convention for SMOS NRT L1A products is described in detail in [AD. 1].

5.4.4 STRUCTURE

The structure of the SMOS NRT L1A products is elaborated in [AD. 1]. Please refer to this document as the main source for information regarding these files.

5.4.5 GMT CONFIGURATION

In addition to the general parameters which can be defined within a map entry, as part of a GMT configuration file, the following filters are applicable when plotting L1A Dual Polarization products:

- Orbit Orbit orientation
- Polarization Polarization mode
- Antenna Antenna number (certain parameters only)
- NIR_element NIR element (certain parameters only)

In particular, the details on these, along with the appropriate values for the product type, the parameter to be plotted, and the overlap resolution policy, are provided below:

X-Path	/GMT_Configuration/Map/Product/Type
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (MIR_SCND1A) are:

	• **MIR_SCND1A** L1A Dual Polarization Calibrated Visibilities
Description	Type of the SMOS products to be plotted. If products of any other type are present in the input directory, they will be silently ignored by the GMT.

X-Path	/GMT_Configuration/Map/Product/Parameter
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (MIR_SCND1A) are: • **Receiver_Temp** Receiver temperature • **Sys_Temp** System temperature • **Receiver_Noise_Temp** Receiver noise temperature • **NIR_Brightness_Temp** NIR brightness temperature • **LICEF_ Brightness_Temp** LICEF brightness temperature • **Max_Mkj_module** Max. module of the normalized quadrature corrected correlation
Description	Parameter whose data is to be plotted. Further details on their actual meaning, units and interpretation can be found in the respective product specifications ([AD. 1], [AD. 2]).

X-Path	/GMT_Configuration/Map/Product/Overlap
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	Average
Format	The valid values are: • **Average** Average all the values at that pixel • **Deviation** Standard deviation at that pixel • **Maximum** Maximum value at that pixel • **Minimum** Minimum value at that pixel • **Oldest** Oldest value at that pixel by sensing time • **Latest** Latest value at that pixel by sensing time
Description	Resolution policy that shall be used when more than a single value falls on a given pixel.

X-Path	/GMT_Configuration/Map/Product/Filters/Orbit
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	All

Format	The valid values are: • **All** All orbit orientations • **Ascending** Ascending orbit orientation only • **Descending** Descending orbit orientation only
Description	Orbit orientation the products must have in order to be plotted. If a product with an orbit orientation different from the one here specified is encountered, it will be silently ignored.

X-Path	/GMT_Configuration/Map/Product/Filters/Polarization
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	HH(H)
Format	The valid values for this type of product (MIR_SCND1A) depend on the parameter selected: *Receiver_Temp / Sys_Temp / Receiver_Noise_Temp:* • **H** Selected antenna in H polarization • **V** Selected antenna in V polarization *Max_Mkj_module* • **All** Arms in any polarization • **HHH** Arms in HHH polarization • **VVV** Arms in VVV polarization
Description	Polarization the input data must have in order to be plotted. If data with a polarization different from the one here specified is encountered, it will be silently ignored.

X-Path	/GMT_Configuration/Map/Product/Filters/Antenna
Type	Integer
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	1
Format	Any integer number in the range [1, 72].
Description	Antenna number the input data must pertain to in order to be plotted. If data from an antenna different from the one here specified is encountered, it will be silently ignored. This parameter is only significative when receiver temperatures, system temperatures, or receiver noise temperatures are to be plotted out of L1A calibrated visibility data.

X-Path	/GMT_Configuration/Map/Product/Filters/NIR_Element
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	AB-H
Format	The valid values for this type of product (MIR_SCND1A) are:

	• **AB-H** • **AB-V** • **AB-T3** • **AB-T4** • **BC-H** • **BC-V** • **BC-T3** • **BC-T4** • **CA-H** • **CA-V** • **CA-T3** • **CA-T4**
Description	NIR element the input data must pertain to in order to be plotted. All data from a NIR element different from the one here specified will be simply ignored. This parameter is only significative when NIR brightness temperatures are to be plotted out of L1A calibrated visibility data.

5.5 SMOS NRT L1A FULL POLARIZATION CALIBRATED VISIBILITIES

5.5.1 GENERAL INFORMATION

The L1A products comprise data obtained in science measurement mode (either pointing to the Earth –nominal- or to external sources - i.e. deep Sky, Moon…-) in both dual and full polarisation. There is a unique type of product, as it contains the calibrated visibilities between receivers, before any reconstruction is applied. These products present these calibrated visibilities in a known array, so that the reconstruction process may reorder and apply the reconstruction algorithm as needed.

The full polarization calibrated visibilities are obtained after converting the full polarization L0 science packets into raw correlations and calibrating them. MIR_SCNF1A products contain one set of complete visibilities for each snapshot. NRTP only generates this type of data upon specific request and for validation purposes.

5.5.2 TYPE AND SIZE

The following SMOS file types are addressed when referring to NRT L1A Full Polarization products, with their typical size indicated next to each entry:

- MIR_SCNF1A 216 MB

5.5.3 FILENAME

The naming convention for SMOS NRT L1A products is described in detail in [AD. 1].

5.5.4 STRUCTURE

The structure of the SMOS NRT L1A products is elaborated in [AD. 1]. Please refer to this document as the main source for information regarding these files.

5.5.5 GMT CONFIGURATION

In addition to the general parameters which can be defined within a map entry, as part of a GMT configuration file, the following filters are applicable when plotting L1A Full Polarization products:

- Orbit Orbit orientation
- Polarization Polarization mode
- Antenna Antenna number (certain parameters only)
- NIR_element NIR element (certain parameters only)

In particular, the details on these, along with the appropriate values for the product type, the parameter to be plotted, and the overlap resolution policy, are provided below:

X-Path	/GMT_Configuration/Map/Product/Type
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (MIR_SCNF1A) are:

	• **MIR_SCNF1A** L1A Full Polarization Calibrated Visibilities
Description	Type of the SMOS products to be plotted. If products of any other type are present in the input directory, they will be silently ignored by the GMT.

X-Path	/GMT_Configuration/Map/Product/Parameter
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (MIR_SCNF1A) are: • **Receiver_Temp** Receiver temperature • **Sys_Temp** System temperature • **Receiver_Noise_Temp** Receiver noise temperature • **NIR_Brightness_Temp** NIR brightness temperature • **LICEF_ Brightness_Temp** LICEF brightness temperature • **Max_Mkj_module** Max. module of the normalized quadrature corrected correlation
Description	Parameter whose data is to be plotted. Further details on their actual meaning, units and interpretation can be found in the respective product specifications ([AD. 1], [AD. 2]).

X-Path	/GMT_Configuration/Map/Product/Overlap
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	Average
Format	The valid values are: • **Average** Average all the values at that pixel • **Deviation** Standard deviation at that pixel • **Maximum** Maximum value at that pixel • **Minimum** Minimum value at that pixel • **Oldest** Oldest value at that pixel by sensing time • **Latest** Latest value at that pixel by sensing time
Description	Resolution policy that shall be used when more than a single value falls on a given pixel.

X-Path	/GMT_Configuration/Map/Product/Filters/Orbit
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	All
Format	The valid values are:

	• **All** All orbit orientations • **Ascending** Ascending orbit orientation only • **Descending** Descending orbit orientation only
Description	Orbit orientation the products must have in order to be plotted. If a product with an orbit orientation different from the one here specified is encountered, it will be silently ignored.

X-Path	/GMT_Configuration/Map/Product/Filters/Polarization
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	HH(H)
Format	The valid values for this type of product (MIR_SCNF1A) depend on the parameter selected: *Receiver_Temp / Sys_Temp / Receiver_Noise_Temp:* • **H** Selected antenna in H polarization • **V** Selected antenna in V polarization *Max_Mkj_module* • **All** Arms in any polarization • **HHH** Arms in HHH polarization • **HVV** Arms in HVV polarization • **VHV** Arms in VHV polarization • **VVH** Arms in VVH polarization • **VVV** Arms in VVV polarization • **VHH** Arms in VHH polarization • **HVH** Arms in HVH polarization • **HHV** Arms in HHV polarization
Description	Polarization the input data must have in order to be plotted. If data with a polarization different from the one here specified is encountered, it will be silently ignored.

X-Path	/GMT_Configuration/Map/Product/Filters/Antenna
Type	Integer
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	1
Format	Any integer number in the range [1, 72].
Description	Antenna number the input data must pertain to in order to be plotted. If data from an antenna different from the one here specified is encountered, it will be silently ignored. This parameter is only significative when receiver temperatures, system temperatures, or receiver noise temperatures are to be plotted out of L1A calibrated visibility data.

X-Path	/GMT_Configuration/Map/Product/Filters/NIR_Element

Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	AB-H
Format	The valid values for this type of product (MIR_SCNF1A) are: • **AB-H** • **AB-V** • **AB-T3** • **AB-T4** • **BC-H** • **BC-V** • **BC-T3** • **BC-T4** • **CA-H** • **CA-V** • **CA-T3** • **CA-T4**
Description	NIR element the input data must pertain to in order to be plotted. All data from a NIR element different from the one here specified will be simply ignored. This parameter is only significative when NIR brightness temperatures are to be plotted out of L1A calibrated visibility data.

5.6 SMOS L1B DUAL POLARIZATION RECONSTRUCTED ŤB FOURIER COMPONENTS

5.6.1 GENERAL INFORMATION

The L1B measurements are the Fourier Components of the resulting Brightness Temperature scenes, which shall be the ones used for L1C processing, with no apodisation applied at this level. This information is presented on a snapshot basis, ordered by time stamp.

Different L1B products are generated depending on the polarization mode of the instrument (dual or full), and their contents change from mode to mode. In dual polarization, one data set record is generated per integration time (1.2s), containing H or V polarization measurements. The dual polarization reconstructed brightness temperature Fourier components are obtained by correcting and reconstructing the L1A calibrated visibilities in dual polarization.

Products are arranged on a pole-to-pole time interval according to ascending and descending passes and grouped according to multiples of the integration time (time sorted and arranged with respect to the originating L1A product).

5.6.2 TYPE AND SIZE

The following SMOS file types are addressed when referring to L1B Dual Polarization products, with their typical size indicated next to each entry:

- MIR_SC_D1B 57,94 MB

5.6.3 FILENAME

The naming convention for SMOS L1B products is described in detail in [AD. 1].

5.6.4 STRUCTURE

The structure of the SMOS L1B products is elaborated in [AD. 1]. Please refer to this document as the main source for information regarding these files.

5.6.5 GMT CONFIGURATION

In addition to the general parameters which can be defined within a map entry, as part of a GMT configuration file, the following filters are applicable when plotting L1B Dual Polarization products:

- Orbit Orbit orientation
- Polarization Polarization mode

In particular, the details on these, along with the appropriate values for the product type, the parameter to be plotted, and the overlap resolution policy, are provided below:

X-Path	/GMT_Configuration/Map/Product/Type
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A

Format	The valid values for this type of product (MIR_SC_D1B) are: • **MIR_SC_D1B** L1B Dual Polarization Reconstructed ŤB Fourier Components
Description	Type of the SMOS products to be plotted. If products of any other type are present in the input directory, they will be silently ignored by the GMT.

X-Path	/GMT_Configuration/Map/Product/Parameter
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (MIR_SC_D1B) are: • **Accuracy** Accuracy • **Physical_Temperatures_STD** Physical temperature standard deviation • **Average_System_Temperatures** Average system temperature • **Direct_Sun_BT** Direct sun brightness temperature • **Constant_Earth_BT** Constant Earth brightness temperature • **Polarisation_Flag** Polarization flag • **SUN_FOV_Flag** Sun field of view flag • **SUN_GLINT_FOV_Flag** Sunglint field of view flag • **MOON_FOV_Flag** Moon field of view flag • **SINGLE_SNAPSHOT_Flag** Single snapshot flag • **FTT_Flag**[1] Flag target transformation flag • **RFI_H_Polarisation_Flag** RFI H polarization flag • **RFI_Flag**[1] Radio Frequency Interference flag • **RFI_V_Polarisation_Flag** RFI V polarization flag • **FTT_Flag** Flag target transformation flag • **RFI_Flag** Radio Frequency Interference flag • **SUN_Position_Flag** Sun position flag • **SUN_Eclipsed_Flag** Sun eclipsed flag • **MOON_Position_Flag** Moon position flag • **MOON_Eclipsed_Flag** Moon eclipsed flag
Description	Parameter whose data is to be plotted. Further details on their actual meaning, units and interpretation can be found in the respective product specifications ([AD. 1], [AD. 2]).

X-Path	/GMT_Configuration/Map/Product/Overlap
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A

[1] Parameter can only be displayed for products produced with versions of the L1P below 700.

Default value	Average
Format	The valid values are: • **Average** Average all the values at that pixel • **Deviation** Standard deviation at that pixel • **Maximum** Maximum value at that pixel • **Minimum** Minimum value at that pixel • **Oldest** Oldest value at that pixel by sensing time • **Latest** Latest value at that pixel by sensing time
Description	Resolution policy that shall be used when more than a single value falls on a given pixel.

X-Path	/GMT_Configuration/Map/Product/Filters/Orbit
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	All
Format	The valid values are: • **All** All orbit orientations • **Ascending** Ascending orbit orientation only • **Descending** Descending orbit orientation only
Description	Orbit orientation the products must have in order to be plotted. If a product with an orbit orientation different from the one here specified is encountered, it will be silently ignored.

X-Path	/GMT_Configuration/Map/Product/Filters/Polarization
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	HH(H)
Format	The valid values for this type of product (MIR_SC_D1B) are: • **HH** HH polarization • **VV** VV polarization
Description	Polarization the input data must have in order to be plotted. If data with a polarization different from the one here specified is encountered, it will be silently ignored.

5.7 SMOS L1B FULL POLARIZATION RECONSTRUCTED ŤB FOURIER COMPONENTS

5.7.1 GENERAL INFORMATION

The L1B measurements are the Fourier Components of the resulting Brightness Temperature scenes, which shall be the ones used for L1C processing, with no apodisation applied at this level. This information is presented on a snapshot basis, ordered by time stamp.

Different L1B products are generated depending on the polarization mode of the instrument (dual or full), and their contents change from mode to mode. In full polarization every alternate integration time generates a data set record (H or V), and the next one generates two data set records (HV and V or HV and H). The full polarization reconstructed brightness temperature Fourier components are obtained by correcting and reconstructing the L1A calibrated visibilities in full polarization.

Products are arranged on a pole-to-pole time interval according to ascending and descending passes and grouped according to multiples of the integration time (time sorted and arranged with respect to the originating L1A product).

5.7.2 TYPE AND SIZE

The following SMOS file types are addressed when referring to L1B Full Polarization products, with their typical size indicated next to each entry:

- MIR_SC_F1B 115,89 MB

5.7.3 FILENAME

The naming convention for SMOS L1B products is described in detail in [AD. 1].

5.7.4 STRUCTURE

The structure of the SMOS L1B products is elaborated in [AD. 1]. Please refer to this document as the main source for information regarding these files.

5.7.5 GMT CONFIGURATION

In addition to the general parameters which can be defined within a map entry, as part of a GMT configuration file, the following filters are applicable when plotting L1B Full Polarization products:

- Orbit Orbit orientation
- Polarization Polarization mode

In particular, the details on these, along with the appropriate values for the product type, the parameter to be plotted, and the overlap resolution policy, are provided below:

X-Path	/GMT_Configuration/Map/Product/Type
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A

Format	The valid values for this type of product (MIR_SC_F1B) are: • **MIR_SC_F1B** L1B Full Polarization Reconstructed $\check{T}_B$ Fourier Components
Description	Type of the SMOS products to be plotted. If products of any other type are present in the input directory, they will be silently ignored by the GMT.

X-Path	/GMT_Configuration/Map/Product/Parameter
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (MIR_SC_F1B) are: • **Accuracy** Accuracy • **Physical_Temperatures_STD** Physical temperature standard deviation • **Average_System_Temperatures** Average system temperature • **Direct_Sun_BT** Direct sun brightness temperature • **Constant_Earth_BT** Constant Earth brightness temperature • **Polarisation_Flag** Polarization flag • **SUN_FOV_Flag** Sun field of view flag • **SUN_GLINT_FOV_Flag** Sunglint field of view flag • **MOON_FOV_Flag** Moon field of view flag • **SINGLE_SNAPSHOT_Flag** Single snapshot flag • **FTT_Flag**[2] Flag target transformation flag • **RFI_H_Polarisation_Flag** RFI H polarization flag • **RFI_Flag**[2] Radio Frequency Interference flag • **RFI_V_Polarisation_Flag** RFI V polarization flag • **RFI_Flag** Radio Frequency Interference flag • **SUN_Position_Flag** Sun position flag • **SUN_Eclipsed_Flag** Sun eclipsed flag • **MOON_Position_Flag** Moon position flag • **MOON_Eclipsed_Flag** Moon eclipsed flag
Description	Parameter whose data is to be plotted. Further details on their actual meaning, units and interpretation can be found in the respective product specifications ([AD. 1], [AD. 2]).

X-Path	/GMT_Configuration/Map/Product/Overlap
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	Average

[2] Parameter can only be displayed for products produced with versions of the L1P below 700.

Format	The valid values are: • **Average** Average all the values at that pixel • **Deviation** Standard deviation at that pixel • **Maximum** Maximum value at that pixel • **Minimum** Minimum value at that pixel • **Oldest** Oldest value at that pixel by sensing time • **Latest** Latest value at that pixel by sensing time
Description	Resolution policy that shall be used when more than a single value falls on a given pixel.

X-Path	/GMT_Configuration/Map/Product/Filters/Orbit
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	All
Format	The valid values are: • **All** All orbit orientations • **Ascending** Ascending orbit orientation only • **Descending** Descending orbit orientation only
Description	Orbit orientation the products must have in order to be plotted. If a product with an orbit orientation different from the one here specified is encountered, it will be silently ignored.

X-Path	/GMT_Configuration/Map/Product/Filters/Polarization
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	HH(H)
Format	The valid values for this type of product (MIR_SC_F1B) are: • **HH** HH polarization • **VV** VV polarization • **HV_real** HV polarization real valued components • **HV_img** HV polarization imaginary valued components
Description	Polarization the input data must have in order to be plotted. If data with a polarization different from the one here specified is encountered, it will be silently ignored.

5.8 SMOS NRT L1B DUAL POLARIZATION RECONSTRUCTED ŤB FOURIER COMPONENTS

5.8.1 GENERAL INFORMATION

The L1B measurements are the Fourier Components of the resulting Brightness Temperature scenes, which shall be the ones used for L1C processing, with no apodisation applied at this level. This information is presented on a snapshot basis, ordered by time stamp.

Different L1B products are generated depending on the polarization mode of the instrument (dual or full), and their contents change from mode to mode. In dual polarization, one data set record is generated per integration time (1.2s), containing H or V polarization measurements. The dual polarization reconstructed brightness temperature Fourier components are obtained by correcting and reconstructing the L1A calibrated visibilities in dual polarization.

Products are arranged on a pole-to-pole time interval according to ascending and descending passes and grouped according to multiples of the integration time (time sorted and arranged with respect to the originating L1A product). NRTP only generates this type of product upon specific request and for validation purposes.

5.8.2 TYPE AND SIZE

The following SMOS file types are addressed when referring to NRT L1B Dual Polarization products, with their typical size indicated next to each entry:

MIR_SCND1B 58 MB

5.8.3 FILENAME

The naming convention for SMOS NRT L1B products is described in detail in [AD. 1].

5.8.4 STRUCTURE

The structure of the SMOS NRT L1B products is elaborated in [AD. 1]. Please refer to this document as the main source for information regarding these files.

5.8.5 GMT CONFIGURATION

In addition to the general parameters which can be defined within a map entry, as part of a GMT configuration file, the following filters are applicable when plotting L1B Dual Polarization products:

- Orbit Orbit orientation
- Polarization Polarization mode

In particular, the details on these, along with the appropriate values for the product type, the parameter to be plotted, and the overlap resolution policy, are provided below:

X-Path	/GMT_Configuration/Map/Product/Type
Type	String

Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (MIR_SCND1B) are: **MIR_SCND1B** L1B Dual Polarization Reconstructed $\check{T}B$ Fourier Components
Description	Type of the SMOS products to be plotted. If products of any other type are present in the input directory, they will be silently ignored by the GMT.

X-Path	/GMT_Configuration/Map/Product/Parameter
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (MIR_SCND1B) are: • **Accuracy** Accuracy • **Physical_Temperatures_STD** Physical temperature standard deviation • **Average_System_Temperatures** Average system temperature • **Direct_Sun_BT** Direct sun brightness temperature • **Constant_Earth_BT** Constant Earth brightness temperature • **Polarisation_Flag** Polarization flag • **SUN_FOV_Flag** Sun field of view flag • **SUN_GLINT_FOV_Flag** Sunglint field of view flag • **MOON_FOV_Flag** Moon field of view flag • **SINGLE_SNAPSHOT_Flag** Single snapshot flag • **FTT_Flag**[3] Flag target transformation flag • **RFI_H_Polarisation_Flag** RFI H polarization flag • **RFI_Flag**[3] Radio Frequency Interference flag • **RFI_V_Polarisation_Flag** RFI V polarization flag • **SUN_Position_Flag** Sun position flag • **SUN_Eclipsed_Flag** Sun eclipsed flag • **MOON_Position_Flag** Moon position flag • **MOON_Eclipsed_Flag** Moon eclipsed flag
Description	Parameter whose data is to be plotted. Further details on their actual meaning, units and interpretation can be found in the respective product specifications ([AD. 1], [AD. 2]).

X-Path	/GMT_Configuration/Map/Product/Overlap
Type	String
Occurrences	0 or 1 **Optional**

[3] Parameter can only be displayed for products produced with versions of the L1P below 700.

Units	N/A
Default value	Average
Format	The valid values are: • **Average** Average all the values at that pixel • **Deviation** Standard deviation at that pixel • **Maximum** Maximum value at that pixel • **Minimum** Minimum value at that pixel • **Oldest** Oldest value at that pixel by sensing time • **Latest** Latest value at that pixel by sensing time
Description	Resolution policy that shall be used when more than a single value falls on a given pixel.

X-Path	/GMT_Configuration/Map/Product/Filters/Orbit
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	All
Format	The valid values are: • **All** All orbit orientations • **Ascending** Ascending orbit orientation only • **Descending** Descending orbit orientation only
Description	Orbit orientation the products must have in order to be plotted. If a product with an orbit orientation different from the one here specified is encountered, it will be silently ignored.

X-Path	/GMT_Configuration/Map/Product/Filters/Polarization
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	HH(H)
Format	The valid values for this type of product (MIR_SCND1B) are: • **HH** HH polarization • **VV** VV polarization
Description	Polarization the input data must have in order to be plotted. If data with a polarization different from the one here specified is encountered, it will be silently ignored.

5.9 SMOS NRT L1B FULL POLARIZATION RECONSTRUCTED ŤB FOURIER COMPONENTS

5.9.1 GENERAL INFORMATION

The L1B measurements are the Fourier Components of the resulting Brightness Temperature scenes, which shall be the ones used for L1C processing, with no apodisation applied at this level. This information is presented on a snapshot basis, ordered by time stamp.

Different L1B products are generated depending on the polarization mode of the instrument (dual or full), and their contents change from mode to mode. In full polarization every alternate integration time generates a data set record (H or V), and the next one generates two data set records (HV and V or HV and H). The full polarization reconstructed brightness temperature Fourier components are obtained by correcting and reconstructing the L1A calibrated visibilities in full polarization.

Products are arranged on a pole-to-pole time interval according to ascending and descending passes and grouped according to multiples of the integration time (time sorted and arranged with respect to the originating L1A product). NRTP only generates this type of product upon specific request and for validation purposes.

5.9.2 TYPE AND SIZE

The following SMOS file types are addressed when referring to NRT L1B Full Polarization products, with their typical size indicated next to each entry:

MIR_SCNF1B 115 MB

5.9.3 FILENAME

The naming convention for SMOS NRT L1B products is described in detail in [AD. 1].

5.9.4 STRUCTURE

The structure of the SMOS NRT L1B products is elaborated in [AD. 1]. Please refer to this document as the main source for information regarding these files.

5.9.5 GMT CONFIGURATION

In addition to the general parameters which can be defined within a map entry, as part of a GMT configuration file, the following filters are applicable when plotting L1B Full Polarization products:

- Orbit Orbit orientation
- Polarization Polarization mode

In particular, the details on these, along with the appropriate values for the product type, the parameter to be plotted, and the overlap resolution policy, are provided below:

X-Path	/GMT_Configuration/Map/Product/Type
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A

Format	The valid values for this type of product (MIR_SCNF1B) are: **MIR_SCNF1B** L1B Full Polarization Reconstructed $\check{T}_B$ Fourier Components
Description	Type of the SMOS products to be plotted. If products of any other type are present in the input directory, they will be silently ignored by the GMT.

X-Path	/GMT_Configuration/Map/Product/Parameter
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (MIR_SCNF1B) are: • **Accuracy** Accuracy • **Physical_Temperatures_STD** Physical temperature standard deviation • **Average_System_Temperatures** Average system temperature • **Direct_Sun_BT** Direct sun brightness temperature • **Constant_Earth_BT** Constant Earth brightness temperature • **Polarisation_Flag** Polarization flag • **SUN_FOV_Flag** Sun field of view flag • **SUN_GLINT_FOV_Flag** Sunglint field of view flag • **MOON_FOV_Flag** Moon field of view flag • **SINGLE_SNAPSHOT_Flag** Single snapshot flag • **FTT_Flag**[4] Flag target transformation flag • **RFI_H_Polarisation_Flag** RFI H polarization flag • **RFI_Flag**[4] Radio Frequency Interference flag • **RFI_V_Polarisation_Flag** RFI V polarization flag • **SUN_Position_Flag** Sun position flag • **SUN_Eclipsed_Flag** Sun eclipsed flag • **MOON_Position_Flag** Moon position flag • **MOON_Eclipsed_Flag** Moon eclipsed flag
Description	Parameter whose data is to be plotted. Further details on their actual meaning, units and interpretation can be found in the respective product specifications ([AD. 1], [AD. 2]).

X-Path	/GMT_Configuration/Map/Product/Overlap
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	Average
Format	The valid values are:

[4] Parameter can only be displayed for products produced with versions of the L1P below 700.

	• **Average** Average all the values at that pixel • **Deviation** Standard deviation at that pixel • **Maximum** Maximum value at that pixel • **Minimum** Minimum value at that pixel • **Oldest** Oldest value at that pixel by sensing time • **Latest** Latest value at that pixel by sensing time
Description	Resolution policy that shall be used when more than a single value falls on a given pixel.

X-Path	/GMT_Configuration/Map/Product/Filters/Orbit
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	All
Format	The valid values are: • **All** All orbit orientations • **Ascending** Ascending orbit orientation only • **Descending** Descending orbit orientation only
Description	Orbit orientation the products must have in order to be plotted. If a product with an orbit orientation different from the one here specified is encountered, it will be silently ignored.

X-Path	/GMT_Configuration/Map/Product/Filters/Polarization
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	HH(H)
Format	The valid values for this type of product (MIR_SCNF1B) are: • **HH** HH polarization • **VV** VV polarization • **HV_real** HV polarization real valued components • **HV_img** HV polarization imaginary valued components
Description	Polarization the input data must have in order to be plotted. If data with a polarization different from the one here specified is encountered, it will be silently ignored.

5.10 SMOS L1C BROWSE $\check{T}B$ IN DUAL POLARIZATION

5.10.1 GENERAL INFORMATION

The L1C products comprise the data obtained in science measurement mode when pointing to the Earth in nominal mode, starting from L1B brightness temperatures Fourier components, performing an inverse FFT and geolocating them in pole-to-pole swaths according to ascending and descending passes. The products include values for geophysical corrections, although they are not applied at this level.

The Browse Brightness Temperature L1C products are arranged in pole-to-pole swaths according to ascending and descending passes. Each grid point contains a brightness temperature sample interpolated from MIRAS measurements at an incidence angle of 42.5º as default (configurable value).

5.10.2 TYPE AND SIZE

The following SMOS file types are addressed when referring to L1C Browse Dual Polarization products, with their typical size indicated next to each entry:

- MIR_BWSD1C 3,20 MB
- MIR_BWLD1C 3,20 MB

5.10.3 FILENAME

The naming convention for SMOS L1C products is described in detail in [AD. 1].

5.10.4 STRUCTURE

The structure of the SMOS L1C products is elaborated in [AD. 1]. Please refer to this document as the main source for information regarding these files.

5.10.5 GMT CONFIGURATION

In addition to the general parameters which can be defined within a map entry, as part of a GMT configuration file, the following filters are applicable when plotting L1C Browse Dual Polarization products:

- Orbit Orbit orientation
- Polarization Polarization mode
- Field_of_View Field of view

In particular, the details on these, along with the appropriate values for the product type, the parameter to be plotted, and the overlap resolution policy, are provided below:

X-Path	/GMT_Configuration/Map/Product/Type
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (MIR_BWXD1C) are: • **MIR_BWXD1C** L1C Browse $\check{T}_B$ in Dual Polarization

Description	Type of the SMOS products to be plotted. If products of any other type are present in the input directory, they will be silently ignored by the GMT.

X-Path	/GMT_Configuration/Map/Product/Parameter
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (MIR_BWXD1C) are: • **Grid_Point_ID** Unique identifier for the grid point • **Grid_Point_Latitude** Latitude of the DGG cell's center • **Grid_Point_Longitude** Longitude of the DGG cell's center • **Grid_Point_Altitude** Altitude of the DGG cell's center • **BT_Data_Counter** Counter of BT values for the current point • **BT_Value** Brightness temperature • **Radiometric_Accuracy_of_Pixel** Error accuracy measurement in the BT • **Azimuth_Angle** Azimuth angle • **Footprint_Axis1** Elliptical footprint major semi-axis value • **Footprint_Axis2** Elliptical footprint major semi-axis value • **Polarisation_Flag** Polarization flag • **SUN_FOV_Flag** Sun field of view flag • **SUN_GLINT_FOV_Flag** Sunglint field of view flag • **MOON_FOV_Flag** Moon field of view flag • **SINGLE_SNAPSHOT_Flag** Single snapshot flag • **FTT_Flag**[5] Flag target transformation flag • **RFI_Flag_V7XX** Radio Frequency Interference flag • **SUN_POINT_Flag** Sun point flag • **SUN_GLINT_AREA_Flag** Sunglint area flag • **MOON_POINT_Flag** Moon point flag • **AF_FOV_Flag** Alias Free field of view flag • **EAF_FOV_Flag** Extended Alias Free field of view flag • **BORDER_FOV_Flag** Extended Alias Free border field of view flag • **SUN_TAILS_Flag** Suntails flag • **RFI_Flag**[5] Radio Frequency Interference flag • **RFI_Contamination_Level_Flag** Level of RFI contamination flag • **USGS_Sea_Flag** Sea in the USGS Land-Sea mask • **USGS_Land_Flag** Land in the USGS Land-Sea mask • **USGS_Mixed_Flag** Mixed in the USGS Land-Sea mask • **200km_Coastal_Flag** Distance from the coast of less than 200 Km

[5] Parameter can only be displayed for products produced with versions of the L1P below 700.

	• **100km_Coastal_Flag** Distance from the coast of less than 100 Km • **40km_Coastal_Flag** Distance from the coast of less than 40 Km • **Min_Sea-Ice_Flag** Pixel is within Minimum Sea-Ice zone • **Max_Sea-Ice_Flag** Pixel is within Maximum Sea-Ice zone • **ST1_ToA** First stokes parameter (total power) • **PI_ToA** Polarization index
Description	Parameter whose data is to be plotted. Further details on their actual meaning, units and interpretation can be found in the respective product specifications ([AD. 1], [AD. 2]).

X-Path	/GMT_Configuration/Map/Product/Overlap
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	Average
Format	The valid values are: • **Average** Average all the values at that bin • **Deviation** Standard deviation at that bin • **Maximum** Maximum value at that bin • **Minimum** Minimum value at that bin • **Oldest** Oldest value at that bin by sensing time • **Latest** Latest value at that bin by sensing time
Description	Resolution policy that shall be used when more than a single value falls within a given bin of the applicable grid.

X-Path	/GMT_Configuration/Map/Product/Filters/Orbit
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	All
Format	The valid values are: • **All** All orbit orientations • **Ascending** Ascending orbit orientation only • **Descending** Descending orbit orientation only
Description	Orbit orientation the products must have in order to be plotted. If a product with an orbit orientation different from the one here specified is encountered, it will be silently ignored.

X-Path	/GMT_Configuration/Map/Product/Filters/Polarization
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A

Default value	HH(H)
Format	The valid values for this type of product (MIR_BWXD1C) are: • **HH** HH polarization • **VV** VV polarization
Description	Polarization the input data must have in order to be plotted. If data with a polarization different from the one here specified is encountered, it will be silently ignored.

X-Path	/GMT_Configuration/Map/Product/Filters/Field_of_View
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	All
Format	The valid values are: • **All** All • **Alias_Free** Alias Free (minus border) • **Extended_Alias_Free** Extended Alias Free (minus border) • **Border** Border
Description	Field of view the input data must pertain to in order to be plotted. If data from a field of view different from the one here specified is encountered, it will be silently ignored.

5.11 SMOS L1C BROWSE $\check{T}B$ IN FULL POLARIZATION

5.11.1 GENERAL INFORMATION

The L1C products comprise the data obtained in science measurement mode when pointing to the Earth in nominal mode, starting from L1B brightness temperatures Fourier components, performing an inverse FFT and geolocating them in pole-to-pole swaths according to ascending and descending passes. The products include values for geophysical corrections, although they are not applied at this level.

The Browse Brightness Temperature L1C products are arranged in pole-to-pole swaths according to ascending and descending passes. Each grid point contains a brightness temperature sample interpolated from MIRAS measurements at an incidence angle of 42.5º as default (configurable value).

5.11.2 TYPE AND SIZE

The following SMOS file types are addressed when referring to L1C Browse Full Polarization products, with their typical size indicated next to each entry:

- MIR_BWSF1C 5,34 MB
- MIR_BWLF1C 5,34 MB

5.11.3 FILENAME

The naming convention for SMOS L1C products is described in detail in [AD. 1].

5.11.4 STRUCTURE

The structure of the SMOS L1C products is elaborated in [AD. 1]. Please refer to this document as the main source for information regarding these files.

5.11.5 GMT CONFIGURATION

In addition to the general parameters which can be defined within a map entry, as part of a GMT configuration file, the following filters are applicable when plotting L1C Browse Full Polarization products:

- Orbit Orbit orientation
- Polarization Polarization mode
- Field_of_View Field of view

In particular, the details on these, along with the appropriate values for the product type, the parameter to be plotted, and the overlap resolution policy, are provided below:

X-Path	/GMT_Configuration/Map/Product/Type
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (MIR_BWXF1C) are: • **MIR_BWXF1C** L1C Browse $\check{T}_B$ in Full Polarization

Description	Type of the SMOS products to be plotted. If products of any other type are present in the input directory, they will be silently ignored by the GMT.

X-Path	/GMT_Configuration/Map/Product/Parameter
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (MIR_BWXF1C) are: • **Grid_Point_ID** Unique identifier for the grid point • **Grid_Point_Latitude** Latitude of the DGG cell's center • **Grid_Point_Longitude** Longitude of the DGG cell's center • **Grid_Point_Altitude** Altitude of the DGG cell's center • **BT_Data_Counter** Counter of BT values for the current point • **BT_Value** Brightness temperature • **Radiometric_Accuracy_of_Pixel** Error accuracy measurement in the BT • **Azimuth_Angle** Azimuth angle • **Footprint_Axis1** Elliptical footprint major semi-axis value • **Footprint_Axis2** Elliptical footprint major semi-axis value • **Polarisation_Flag** Polarization flag • **SUN_FOV_Flag** Sun field of view flag • **SUN_GLINT_FOV_Flag** Sunglint field of view flag • **MOON_FOV_Flag** Moon field of view flag • **SINGLE_SNAPSHOT_Flag** Single snapshot flag • **FTT_Flag**[6] Flag target transformation flag • **RFI_Flag_V7XX** Radio Frequency Interference flag • **SUN_POINT_Flag** Sun point flag • **SUN_GLINT_AREA_Flag** Sunglint area flag • **MOON_POINT_Flag** Moon point flag • **AF_FOV_Flag** Alias Free field of view flag • **EAF_FOV_Flag** Extended Alias Free field of view flag • **BORDER_FOV_Flag** Extended Alias Free border field of view flag • **SUN_TAILS_Flag** Suntails flag • **RFI_Flag**[6] Radio Frequency Interference flag • **RFI_Contamination_Level_Flag** Level of RFI contamination flag • **USGS_Sea_Flag** Sea in the USGS Land-Sea mask • **USGS_Land_Flag** Land in the USGS Land-Sea mask • **USGS_Mixed_Flag** Mixed in the USGS Land-Sea mask • **200km_Coastal_Flag** Distance from the coast of less than 200 Km

[6] Parameter can only be displayed for products produced with versions of the L1P below 700.

	• **100km_Coastal_Flag**	Distance from the coast of less than 100 Km
	• **40km_Coastal_Flag**	Distance from the coast of less than 40 Km
	• **Min_Sea-Ice_Flag**	Pixel is within Minimum Sea-Ice zone
	• **Max_Sea-Ice_Flag**	Pixel is within Maximum Sea-Ice zone
	• **ST1_ToA**	First stokes parameter (total power)
	• **PI_ToA**	Polarization index
	• **BT_Module**	Module of the cross-polarization BT
Description	Parameter whose data is to be plotted. Further details on their actual meaning, units and interpretation can be found in the respective product specifications ([AD. 1], [AD. 2]).	

X-Path	/GMT_Configuration/Map/Product/Overlap
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	Average
Format	The valid values are: • **Average** Average all the values at that bin • **Deviation** Standard deviation at that bin • **Maximum** Maximum value at that bin • **Minimum** Minimum value at that bin • **Oldest** Oldest value at that bin by sensing time • **Latest** Latest value at that bin by sensing time
Description	Resolution policy that shall be used when more than a single value falls within a given bin of the applicable grid.

X-Path	/GMT_Configuration/Map/Product/Filters/Orbit
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	All
Format	The valid values are: • **All** All orbit orientations • **Ascending** Ascending orbit orientation only • **Descending** Descending orbit orientation only
Description	Orbit orientation the products must have in order to be plotted. If a product with an orbit orientation different from the one here specified is encountered, it will be silently ignored.

X-Path	/GMT_Configuration/Map/Product/Filters/Polarization
Type	String
Occurrences	0 or 1 **Optional**

Units	N/A
Default value	HH(H)
Format	The valid values for this type of product (MIR_BWXF1C) are: • **HH** HH polarization • **VV** VV polarization • **HV_real** HV polarization real valued components (Stokes T3) • **HV_img** HV polarization imaginary valued components (Stokes T4)
Description	Polarization the input data must have in order to be plotted. If data with a polarization different from the one here specified is encountered, it will be silently ignored.

X-Path	/GMT_Configuration/Map/Product/Filters/Field_of_View
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	All
Format	The valid values are: • **All** All • **Alias_Free** Alias Free (minus border) • **Extended_Alias_Free** Extended Alias Free (minus border) • **Border** Border
Description	Field of view the input data must pertain to in order to be plotted. If data from a field of view different from the one here specified is encountered, it will be silently ignored.

5.12 SMOS NRT L1C BROWSE ŤB IN DUAL POLARIZATION

5.12.1 GENERAL INFORMATION

The L1C products comprise the data obtained in science measurement mode when pointing to the Earth in nominal mode, starting from L1B brightness temperatures Fourier components, performing an inverse FFT and geolocating them in pole-to-pole swaths according to ascending and descending passes. The products include values for geophysical corrections, although they are not applied at this level.

The Browse Brightness Temperature L1C products are arranged in pole-to-pole swaths according to ascending and descending passes. Each grid point contains a brightness temperature sample interpolated from MIRAS measurements at an incidence angle of 42.5º as default (configurable value).

NRT L1C BW products are not separated into Land and Sea products, instead they are arranged in swaths on a full orbit time interval according to ascending and descending passes. The product contents will be organised in a way as to remove all unnecessary information related to geolocation of overlapping pixels.

5.12.2 TYPE AND SIZE

The following SMOS file types are addressed when referring to NRT L1C Browse Dual Polarization products, with their typical size indicated next to each entry:

- MIR_BWND1C 4 MB

5.12.3 FILENAME

The naming convention for SMOS NRT L1C products is described in detail in [AD. 1].

5.12.4 STRUCTURE

The structure of the SMOS NRT L1C products is elaborated in [AD. 1]. Please refer to this document as the main source for information regarding these files.

5.12.5 GMT CONFIGURATION

In addition to the general parameters which can be defined within a map entry, as part of a GMT configuration file, the following filters are applicable when plotting L1C Browse Dual Polarization products:

- Orbit Orbit orientation
- Polarization Polarization mode
- Field_of_View Field of view

In particular, the details on these, along with the appropriate values for the product type, the parameter to be plotted, and the overlap resolution policy, are provided below:

X-Path	/GMT_Configuration/Map/Product/Type
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A

Format	The valid values for this type of product (MIR_BWND1C) are: • **MIR_BWND1C** L1C Browse $\check{T}_B$ in Dual Polarization
Description	Type of the SMOS products to be plotted. If products of any other type are present in the input directory, they will be silently ignored by the GMT.

X-Path	/GMT_Configuration/Map/Product/Parameter
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (MIR_BWND1C) are: • **Grid_Point_ID** Unique identifier for the grid point • **Grid_Point_Latitude** Latitude of the DGG cell's center • **Grid_Point_Longitude** Longitude of the DGG cell's center • **Grid_Point_Altitude** Altitude of the DGG cell's center • **BT_Data_Counter** Counter of BT values for the current point • **BT_Value** Brightness temperature • **Radiometric_Accuracy_of_Pixel** Error accuracy measurement in the BT • **Azimuth_Angle** Azimuth angle • **Footprint_Axis1** Elliptical footprint major semi-axis value • **Footprint_Axis2** Elliptical footprint major semi-axis value • **Polarisation_Flag** Polarization flag • **SUN_FOV_Flag** Sun field of view flag • **SUN_GLINT_FOV_Flag** Sunglint field of view flag • **MOON_FOV_Flag** Moon field of view flag • **SINGLE_SNAPSHOT_Flag** Single snapshot flag • **FTT_Flag**[7] Flag target transformation flag • **RFI_Flag_V7XX** Radio Frequency Interference flag • **SUN_POINT_Flag** Sun point flag • **SUN_GLINT_AREA_Flag** Sunglint area flag • **MOON_POINT_Flag** Moon point flag • **AF_FOV_Flag** Alias Free field of view flag • **EAF_FOV_Flag** Extended Alias Free field of view flag • **BORDER_FOV_Flag** Extended Alias Free border field of view flag • **SUN_TAILS_Flag** Suntails flag • **RFI_Flag**[7] Radio Frequency Interference flag • **RFI_Contamination_Level_Flag** Level of RFI contamination flag • **USGS_Sea_Flag** Sea in the USGS Land-Sea mask • **USGS_Land_Flag** Land in the USGS Land-Sea mask

[7] Parameter can only be displayed for products produced with versions of the L1P below 700.

	• **USGS_Mixed_Flag** Mixed in the USGS Land-Sea mask • **200km_Coastal_Flag** Distance from the coast of less than 200 Km • **100km_Coastal_Flag** Distance from the coast of less than 100 Km • **40km_Coastal_Flag** Distance from the coast of less than 40 Km • **Min_Sea-Ice_Flag** Pixel is within Minimum Sea-Ice zone • **Max_Sea-Ice_Flag** Pixel is within Maximum Sea-Ice zone • **ST1_ToA** First stokes parameter (total power) • **PI_ToA** Polarization index
Description	Parameter whose data is to be plotted. Further details on their actual meaning, units and interpretation can be found in the respective product specifications ([AD. 1], [AD. 2]).

X-Path	/GMT_Configuration/Map/Product/Overlap
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	Average
Format	The valid values are: • **Average** Average all the values at that bin • **Deviation** Standard deviation at that bin • **Maximum** Maximum value at that bin • **Minimum** Minimum value at that bin • **Oldest** Oldest value at that bin by sensing time • **Latest** Latest value at that bin by sensing time
Description	Resolution policy that shall be used when more than a single value falls within a given bin of the applicable grid.

X-Path	/GMT_Configuration/Map/Product/Filters/Orbit
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	All
Format	The valid values are: • **All** All orbit orientations • **Ascending** Ascending orbit orientation only • **Descending** Descending orbit orientation only
Description	Orbit orientation the products must have in order to be plotted. If a product with an orbit orientation different from the one here specified is encountered, it will be silently ignored.

X-Path	/GMT_Configuration/Map/Product/Filters/Polarization
Type	String

Occurrences	0 or 1 **Optional**
Units	N/A
Default value	HH(H)
Format	The valid values for this type of product (MIR_BWND1C) are: • **HH** HH polarization • **VV** VV polarization
Description	Polarization the input data must have in order to be plotted. If data with a polarization different from the one here specified is encountered, it will be silently ignored.

X-Path	/GMT_Configuration/Map/Product/Filters/Field_of_View
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	All
Format	The valid values are: • **All** All • **Alias_Free** Alias Free (minus border) • **Extended_Alias_Free** Extended Alias Free (minus border) • **Border** Border
Description	Field of view the input data must pertain to in order to be plotted. If data from a field of view different from the one here specified is encountered, it will be silently ignored.

5.13 SMOS NRT L1C BROWSE ŤB IN FULL POLARIZATION

5.13.1 GENERAL INFORMATION

The L1C products comprise the data obtained in science measurement mode when pointing to the Earth in nominal mode, starting from L1B brightness temperatures Fourier components, performing an inverse FFT and geolocating them in pole-to-pole swaths according to ascending and descending passes. The products include values for geophysical corrections, although they are not applied at this level.

The Browse Brightness Temperature L1C products are arranged in pole-to-pole swaths according to ascending and descending passes. Each grid point contains a brightness temperature sample interpolated from MIRAS measurements at an incidence angle of 42.5º as default (configurable value).

NRT L1C BW are not separated into Land and Sea products, instead they are arranged in swaths on a full orbit time interval according to ascending and descending passes. The product contents will be organised in a way as to remove all unnecessary information related to geolocation of overlapping pixels.

5.13.2 TYPE AND SIZE

The following SMOS file types are addressed when referring to NRT L1C Browse Full Polarization products, with their typical size indicated next to each entry:

- MIR_BWNF1C 7.6 MB

5.13.3 FILENAME

The naming convention for SMOS NRT L1C products is described in detail in [AD. 1].

5.13.4 STRUCTURE

The structure of the SMOS NRT L1C products is elaborated in [AD. 1]. Please refer to this document as the main source for information regarding these files.

5.13.5 GMT CONFIGURATION

In addition to the general parameters which can be defined within a map entry, as part of a GMT configuration file, the following filters are applicable when plotting L1C Browse Full Polarization products:

- Orbit Orbit orientation
- Polarization Polarization mode
- Field_of_View Field of view

In particular, the details on these, along with the appropriate values for the product type, the parameter to be plotted, and the overlap resolution policy, are provided below:

X-Path	/GMT_Configuration/Map/Product/Type
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A

Format	The valid values for this type of product (MIR_BWNF1C) are: • **MIR_BWNF1C** L1C Browse $\check{T}_B$ in Full Polarization
Description	Type of the SMOS products to be plotted. If products of any other type are present in the input directory, they will be silently ignored by the GMT.

X-Path	/GMT_Configuration/Map/Product/Parameter
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (MIR_BWNF1C) are: • **Grid_Point_ID** Unique identifier for the grid point • **Grid_Point_Latitude** Latitude of the DGG cell's center • **Grid_Point_Longitude** Longitude of the DGG cell's center • **Grid_Point_Altitude** Altitude of the DGG cell's center • **BT_Data_Counter** Counter of BT values for the current point • **BT_Value** Brightness temperature • **Radiometric_Accuracy_of_Pixel** Error accuracy measurement in the BT • **Azimuth_Angle** Azimuth angle • **Footprint_Axis1** Elliptical footprint major semi-axis value • **Footprint_Axis2** Elliptical footprint major semi-axis value • **Polarisation_Flag** Polarization flag • **SUN_FOV_Flag** Sun field of view flag • **SUN_GLINT_FOV_Flag** Sunglint field of view flag • **MOON_FOV_Flag** Moon field of view flag • **SINGLE_SNAPSHOT_Flag** Single snapshot flag • **FTT_Flag**[8] Flag target transformation flag • **RFI_Flag_V7XX** Radio Frequency Interference flag • **SUN_POINT_Flag** Sun point flag • **SUN_GLINT_AREA_Flag** Sunglint area flag • **MOON_POINT_Flag** Moon point flag • **AF_FOV_Flag** Alias Free field of view flag • **EAF_FOV_Flag** Extended Alias Free field of view flag • **BORDER_FOV_Flag** Extended Alias Free border field of view flag • **SUN_TAILS_Flag** Suntails flag • **RFI_Flag**[8] Radio Frequency Interference flag • **RFI_Contamination_Level_Flag** Level of RFI contamination flag • **USGS_Sea_Flag** Sea in the USGS Land-Sea mask • **USGS_Land_Flag** Land in the USGS Land-Sea mask

[8] Parameter can only be displayed for products produced with versions of the L1P below 700.

	• **USGS_Mixed_Flag** — Mixed in the USGS Land-Sea mask • **200km_Coastal_Flag** — Distance from the coast of less than 200 Km • **100km_Coastal_Flag** — Distance from the coast of less than 100 Km • **40km_Coastal_Flag** — Distance from the coast of less than 40 Km • **Min_Sea-Ice_Flag** — Pixel is within Minimum Sea-Ice zone • **Max_Sea-Ice_Flag** — Pixel is within Maximum Sea-Ice zone • **ST1_ToA** — First stokes parameter (total power) • **PI_ToA** — Polarization index • **BT_Module** — Module of the cross-polarization BT
Description	Parameter whose data is to be plotted. Further details on their actual meaning, units and interpretation can be found in the respective product specifications ([AD. 1], [AD. 2]).

X-Path	/GMT_Configuration/Map/Product/Overlap
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	Average
Format	The valid values are: • **Average** — Average all the values at that bin • **Deviation** — Standard deviation at that bin • **Maximum** — Maximum value at that bin • **Minimum** — Minimum value at that bin • **Oldest** — Oldest value at that bin by sensing time • **Latest** — Latest value at that bin by sensing time
Description	Resolution policy that shall be used when more than a single value falls within a given bin of the applicable grid.

X-Path	/GMT_Configuration/Map/Product/Filters/Orbit
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	All
Format	The valid values are: • **All** — All orbit orientations • **Ascending** — Ascending orbit orientation only • **Descending** — Descending orbit orientation only
Description	Orbit orientation the products must have in order to be plotted. If a product with an orbit orientation different from the one here specified is encountered, it will be silently ignored.

X-Path	/GMT_Configuration/Map/Product/Filters/Polarization

Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	HH(H)
Format	The valid values for this type of product (MIR_BWNF1C) are: • **HH** HH polarization • **VV** VV polarization • **HV_real** HV polarization real valued components (Stokes T3) • **HV_img** HV polarization imaginary valued components (Stokes T4)
Description	Polarization the input data must have in order to be plotted. If data with a polarization different from the one here specified is encountered, it will be silently ignored.

X-Path	/GMT_Configuration/Map/Product/Filters/Field_of_View
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	All
Format	The valid values are: • **All** All • **Alias_Free** Alias Free (minus border) • **Extended_Alias_Free** Extended Alias Free (minus border) • **Border** Border
Description	Field of view the input data must pertain to in order to be plotted. If data from a field of view different from the one here specified is encountered, it will be silently ignored.

5.14 SMOS L1C DUAL POLARIZATION RECONSTRUCTED ŤB SWATH

5.14.1 GENERAL INFORMATION

The L1C products comprise the data obtained in science measurement mode when pointing to the Earth in nominal mode, starting from L1B brightness temperatures Fourier components, performing an inverse FFT and geolocating them in pole-to-pole swaths according to ascending and descending passes. The products include values for geophysical corrections, although they are not applied at this level.

The dual polarization reconstructed brightness temperature swaths are L1C products obtained from MIR_SC_D1B products when pointing to the Earth. They are organized in grid points (these belonging to the DGG grid organized in equal-area cells corresponding to $2.7 \cdot 10^6$ points), with each point containing several brightness temperature samples on top of the atmosphere (at the antenna reference frame), and also a number of geophysical parameters allowing geophysical corrections in upper processing levels.

It shall be pointed that the MIR_SCLD1C products cover 200km of land each, while the MIR_SCSD1C cover 200km of sea.

5.14.2 TYPE AND SIZE

The following SMOS file types are addressed when referring to L1C Dual Polarization products, with their typical size indicated next to each entry:

- MIR_SCSD1C 298,10 MB
- MIR_SCLD1C 298,10 MB

5.14.3 FILENAME

The naming convention for SMOS L1C products is described in detail in [AD. 1].

5.14.4 STRUCTURE

The structure of the SMOS L1C products is elaborated in [AD. 1]. Please refer to this document as the main source for information regarding these files.

5.14.5 GMT CONFIGURATION

In addition to the general parameters which can be defined within a map entry, as part of a GMT configuration file, the following filters are applicable when plotting L1C Dual Polarization products:

- Orbit Orbit orientation
- Polarization Polarization mode
- Field_of_View Field of view
- Target Target incidence angle
- Minimum Minimum incidence angle
- Maximum Maximum incidence angle

In addition the following flag is applicable when plotting L1C Dual Polarization products:

- Average Flag to select whether values are averaged within a product

In particular, the details on these, along with the appropriate values for the product type, the parameter to be plotted, and the overlap resolution policy, are provided below:

X-Path	/GMT_Configuration/Map/Product/Type
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (MIR_SCXD1C) are: • **MIR_SCXD1C** L1C Dual Polarization Reconstructed ŤB Swath
Description	Type of the SMOS products to be plotted. If products of any other type are present in the input directory, they will be silently ignored by the GMT.

X-Path	/GMT_Configuration/Map/Product/Parameter
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (MIR_SCXD1C) are: • **Grid_Point_ID** Unique identifier for the grid point • **Grid_Point_Latitude** Latitude of the DGG cell's center • **Grid_Point_Longitude** Longitude of the DGG cell's center • **Grid_Point_Altitude** Altitude of the DGG cell's center • **BT_Data_Counter** Counter of BT values for the current point • **BT_Value** Brightness temperature • **Pixel_Radiometric_Accuracy** Error accuracy measurement in the BT • **Incidence_Angle** Incidence angle • **Azimuth_Angle** Azimuth angle • **Faraday_Rotation_Angle** Faraday rotation angle • **Geometric_Rotation_Angle** Geometric rotation angle • **Snapshot_ID_of_Pixel** Unique identifier for the snapshot • **Footprint_Axis1** Elliptical footprint major semi-axis value • **Footprint_Axis2** Elliptical footprint major semi-axis value • **Polarisation_Flag** Polarization flag • **SUN_FOV_Flag** Sun field of view flag • **SUN_GLINT_FOV_Flag** Sunglint field of view flag • **MOON_FOV_Flag** Moon field of view flag • **SINGLE_SNAPSHOT_Flag** Single snapshot flag • **FTT_Flag**[9] Flag target transformation flag • **RFI_Flag_V7XX** Radio Frequency Interference flag • **SUN_POINT_Flag** Sun point flag • **SUN_GLINT_AREA_Flag** Sunglint area flag

[9] Parameter can only be displayed for products produced with versions of the L1P below 700.

	• **MOON_POINT_Flag** Moon point flag • **AF_FOV_Flag** Alias Free field of view flag • **EAF_FOV_Flag** Extended Alias Free field of view flag • **BORDER_FOV_Flag** Extended Alias Free border field of view flag • **SUN_TAILS_Flag** Suntails flag • **RFI_Flag**[9] Radio Frequency Interference flag • **RFI_Contamination_Level_Flag** Level of RFI contamination flag • **USGS_Sea_Flag** Sea in the USGS Land-Sea mask • **USGS_Land_Flag** Land in the USGS Land-Sea mask • **USGS_Mixed_Flag** Mixed in the USGS Land-Sea mask • **200km_Coastal_Flag** Distance from the coast of less than 200 Km • **100km_Coastal_Flag** Distance from the coast of less than 100 Km • **40km_Coastal_Flag** Distance from the coast of less than 40 Km • **Min_Sea-Ice_Flag** Pixel is within Minimum Sea-Ice zone • **Max_Sea-Ice_Flag** Pixel is within Maximum Sea-Ice zone • **ST1_ToA** First stokes parameter (total power) • **PI_ToA** Polarization index
Description	Parameter whose data is to be plotted. Further details on their actual meaning, units and interpretation can be found in the respective product specifications ([AD. 1], [AD. 2]).

X-Path	/GMT_Configuration/Map/Product/Overlap
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	Average
Format	The valid values are: • **Average** Average all the values at that bin • **Deviation** Standard deviation at that bin • **Maximum** Maximum value at that bin • **Minimum** Minimum value at that bin • **Oldest** Oldest value at that bin by sensing time • **Latest** Latest value at that bin by sensing time • **Nearest** Nearest measurement with respect to the target angle
Description	Resolution policy that shall be used when the input products, or filtering of the input products, provide multiple values which fall within a given bin of the applicable grid.

X-Path	/GMT_Configuration/Map/Product/Filters/Orbit
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A

Default value	All
Format	The valid values are: • **All** All orbit orientations • **Ascending** Ascending orbit orientation only • **Descending** Descending orbit orientation only
Description	Orbit orientation the products must have in order to be plotted. If a product with an orbit orientation different from the one here specified is encountered, it will be silently ignored.

X-Path	/GMT_Configuration/Map/Product/Filters/Polarization
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	HH(H)
Format	The valid values for this type of product (MIR_SCXD1C) are: • **HHH** HHH polarization • **VVV** VVV polarization
Description	Polarization the input data must have in order to be plotted. If data with a polarization different from the one here specified is encountered, it will be silently ignored.

X-Path	/GMT_Configuration/Map/Product/Filters/Field_of_View
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	All
Format	The valid values are: • **All** All • **Alias_Free** Alias Free (minus border) • **Extended_Alias_Free** Extended Alias Free (minus border) • **Border** Border
Description	Field of view the input data must pertain to in order to be plotted. If data from a field of view different from the one here specified is encountered, it will be silently ignored.

X-Path	/GMT_Configuration/Map/Product/Filters/Incidence_Angle/Target
Type	Real
Occurrences	0 or 1 **Optional**
Units	Degrees
Default value	42.5
Format	Any rational number in the range [0.0, 90.0].
Description	Target incidence angle for the filtering of the input data. Whenever multiple data for a pixel is found, which falls within the range defined for the incidence angle, the one closest to this target value will be selected if the Incidence_Angle/Average = 0 option is selected or not specified. Any other value is silently discarded. If data is returned from multiple input products, the Overlap option then defines the policy which is applied to these values.

	If Incidence_Angle/Average = 1 is selected, the target is ignored.

X-Path	/GMT_Configuration/Map/Product/Filters/Incidence_Angle/Minimum
Type	Real
Occurrences	0 or 1 **Optional**
Units	Degrees
Default value	0.0
Format	Any rational number in the range [0.0, 90.0].
Description	Minimum incidence angle for the filtering of the input data. Whenever multiple data for a pixel is found, its incidence angle must be equal or greater than this in order to be considered for further processing. Any other value is silently discarded.

X-Path	/GMT_Configuration/Map/Product/Filters/Incidence_Angle/Maximum
Type	Real
Occurrences	0 or 1 **Optional**
Units	Degrees
Default value	90.0
Format	Any rational number in the range [0.0, 90.0].
Description	Maximum incidence angle for the filtering of the input data. Whenever multiple data for a pixel is found, its incidence angle must be equal or smaller than this in order to be considered for further processing. Any other value is silently discarded.

X-Path	/GMT_Configuration/Map/Product/Filters/Incidence_Angle/Average
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	0
Format	The valid values are: • **0** Use the nearest measurement with respect to the target angle. • **1** Average the values of the data within the specified incidence angle range.
Description	When Average = 1, the data within the incidence angle range defined by Maximum and Minimum is averaged for each input product. When Average = 0, the value nearest to the target is selected for each input product. If data is returned from multiple input products, the Overlap option then defines the policy which is applied to these values.

5.15 SMOS L1C FULL POLARIZATION RECONSTRUCTED ŤB SWATH

5.15.1 GENERAL INFORMATION

The L1C products comprise the data obtained in science measurement mode when pointing to the Earth in nominal mode, starting from L1B brightness temperatures Fourier components, performing an inverse FFT and geolocating them in pole-to-pole swaths according to ascending and descending passes. The products include values for geophysical corrections, although they are not applied at this level.

The full polarization reconstructed brightness temperature swaths are L1C products obtained from MIR_SC_F1B products when pointing to the Earth. They are organized in grid points (these belonging to the DGG grid organized in equal-area cells corresponding to $2.7 \cdot 10^6$ points), with each point containing several brightness temperature samples on top of the atmosphere (at the antenna reference frame), and also a number of geophysical parameters allowing geophysical corrections in upper processing levels.

It shall be pointed that the MIR_SCLF1C products cover 200km of land each, while the MIR_SCSF1C cover 200km of sea.

5.15.2 TYPE AND SIZE

The following SMOS file types are addressed when referring to L1C Full Polarization products, with their typical size indicated next to each entry:

- MIR_SCSF1C 520,57 MB
- MIR_SCLF1C 520,57 MB

5.15.3 FILENAME

The naming convention for SMOS L1C products is described in detail in [AD. 1].

5.15.4 STRUCTURE

The structure of the SMOS L1C products is elaborated in [AD. 1]. Please refer to this document as the main source for information regarding these files.

5.15.5 GMT CONFIGURATION

In addition to the general parameters which can be defined within a map entry, as part of a GMT configuration file, the following filters are applicable when plotting L1C Full Polarization products:

- Orbit Orbit orientation
- Polarization Polarization mode
- Field_of_View Field of view
- Target Target incidence angle
- Minimum Minimum incidence angle
- Maximum Maximum incidence angle

In addition the following flag is applicable when plotting L1C Dual Polarization products:

- Average Flag to select whether values are averaged within a product

In particular, the details on these, along with the appropriate values for the product type, the parameter to be plotted, and the overlap resolution policy, are provided below:

X-Path	/GMT_Configuration/Map/Product/Type
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (MIR_SCXF1C) are: • **MIR_SCXF1C** L1C Full Polarization Reconstructed ŤB Swath
Description	Type of the SMOS products to be plotted. If products of any other type are present in the input directory, they will be silently ignored by the GMT.

X-Path	/GMT_Configuration/Map/Product/Parameter
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (MIR_SCXF1C) are: • **Grid_Point_ID** Unique identifier for the grid point • **Grid_Point_Latitude** Latitude of the DGG cell's center • **Grid_Point_Longitude** Longitude of the DGG cell's center • **Grid_Point_Altitude** Altitude of the DGG cell's center • **BT_Data_Counter** Counter of BT values for the current point • **BT_Value_Real** Brightness temperature (real component) • **BT_Value_Imag** Brightness temperature (imaginary part) • **Pixel_Radiometric_Accuracy** Error accuracy measurement in the BT • **Incidence_Angle** Incidence angle • **Azimuth_Angle** Azimuth angle • **Faraday_Rotation_Angle** Faraday rotation angle • **Geometric_Rotation_Angle** Geometric rotation angle • **Snapshot_ID_of_Pixel** Unique identifier for the snapshot • **Footprint_Axis1** Elliptical footprint major semi-axis value • **Footprint_Axis2** Elliptical footprint major semi-axis value • **Polarisation_Flag** Polarization flag • **SUN_FOV_Flag** Sun field of view flag • **SUN_GLINT_FOV_Flag** Sunglint field of view flag • **MOON_FOV_Flag** Moon field of view flag • **SINGLE_SNAPSHOT_Flag** Single snapshot flag • **FTT_Flag**[10] Flag target transformation flag • **RFI_Flag_V7XX** Radio Frequency Interference flag • **SUN_POINT_Flag** Sun point flag

[10] Parameter can only be displayed for products produced with versions of the L1P below 700.

	• **SUN_GLINT_AREA_Flag** Sunglint area flag • **MOON_POINT_Flag** Moon point flag • **AF_FOV_Flag** Alias Free field of view flag • **EAF_FOV_Flag** Extended Alias Free field of view flag • **BORDER_FOV_Flag** Extended Alias Free border field of view flag • **SUN_TAILS_Flag** Suntails flag • **RFI_Flag**[10] Radio Frequency Interference flag • **RFI_Contamination_Level_Flag** Level of RFI contamination flag • **USGS_Sea_Flag** Sea in the USGS Land-Sea mask • **USGS_Land_Flag** Land in the USGS Land-Sea mask • **USGS_Mixed_Flag** Mixed in the USGS Land-Sea mask • **200km_Coastal_Flag** Distance from the coast of less than 200 Km • **100km_Coastal_Flag** Distance from the coast of less than 100 Km • **40km_Coastal_Flag** Distance from the coast of less than 40 Km • **Min_Sea-Ice_Flag** Pixel is within Minimum Sea-Ice zone • **Max_Sea-Ice_Flag** Pixel is within Maximum Sea-Ice zone • **ST1_ToA** First stokes parameter (total power) • **PI_ToA** Polarization index • **BT_Module** Module of the cross-polarization BT
Description	Parameter whose data is to be plotted. Further details on their actual meaning, units and interpretation can be found in the respective product specifications ([AD. 1], [AD. 2]).

X-Path	/GMT_Configuration/Map/Product/Overlap
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	Average
Format	The valid values are: • **Average** Average all the values at that bin • **Deviation** Standard deviation at that bin • **Maximum** Maximum value at that bin • **Minimum** Minimum value at that bin • **Oldest** Oldest value at that bin by sensing time • **Latest** Latest value at that bin by sensing time • **Nearest** The nearest measurement with respect to the target angle
Description	Resolution policy that shall be used when the input products, or filtering of the input products, provide multiple values which fall within a given bin of the applicable grid.

X-Path	/GMT_Configuration/Map/Product/Filters/Orbit
Type	String
Occurrences	0 or 1 **Optional**

Units	N/A
Default value	All
Format	The valid values are: • **All** All orbit orientations • **Ascending** Ascending orbit orientation only • **Descending** Descending orbit orientation only
Description	Orbit orientation the products must have in order to be plotted. If a product with an orbit orientation different from the one here specified is encountered, it will be silently ignored.

X-Path	/GMT_Configuration/Map/Product/Filters/Polarization
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	HH(H)
Format	The valid values for this type of product (MIR_SCXF1C) are: • **HHH** HHH polarization • **VVV** VVV polarization • **HHV** HHV, HVH or VHH polarization • **VVH** VVH, VHV or HVV polarization • HHV_VVH HHV or VVH polarizations (polarization option used to map T3 and T4)
Description	Polarization the input data must have in order to be plotted. If data with a polarization different from the one here specified is encountered, it will be silently ignored.

X-Path	/GMT_Configuration/Map/Product/Filters/Field_of_View
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	All
Format	The valid values are: • **All** All • **Alias_Free** Alias Free (minus border) • **Extended_Alias_Free** Extended Alias Free (minus border) • **Border** Border
Description	Field of view the input data must pertain to in order to be plotted. If data from a field of view different from the one here specified is encountered, it will be silently ignored.

X-Path	/GMT_Configuration/Map/Product/Filters/Incidence_Angle/Target
Type	Real
Occurrences	0 or 1 **Optional**
Units	Degrees
Default value	42.5

Format	Any rational number in the range [0.0, 90.0].
Description	Target incidence angle for the filtering of the input data. Whenever multiple data for a pixel is found, which falls within the range defined for the incidence angle, the one closest to this target value will be selected if the Incidence_Angle/Average = 0 option is selected or not specified. Any other value is silently discarded. If data is returned from multiple input products, the Overlap option then defines the policy which is applied to these values. If Incidence_Angle/Average= = 1 is selected, the target is ignored.

X-Path	/GMT_Configuration/Map/Product/Filters/Incidence_Angle/Minimum
Type	Real
Occurrences	0 or 1 **Optional**
Units	Degrees
Default value	0.0
Format	Any rational number in the range [0.0, 90.0].
Description	Minimum incidence angle for the filtering of the input data. Whenever multiple data for a pixel is found, its incidence angle must be equal or greater than this in order to be considered for further processing. Any other value is silently discarded.

X-Path	/GMT_Configuration/Map/Product/Filters/Incidence_Angle/Maximum
Type	Real
Occurrences	0 or 1 **Optional**
Units	Degrees
Default value	90.0
Format	Any rational number in the range [0.0, 90.0].
Description	Maximum incidence angle for the filtering of the input data. Whenever multiple data for a pixel is found, its incidence angle must be equal or smaller than this in order to be considered for further processing. Any other value is silently discarded.

X-Path	/GMT_Configuration/Map/Product/Filters/Incidence_Angle/Average
Type	Integer
Occurrences	0 or 1 **Optional**
Units	NA
Default value	0
Format	The valid values are 0 or 1.
Description	The *Average* option selects whether the measurements whose incidence angle is inside the defined ranges are averaged (*Average* = 1) or if the nearest measurement with respect to the target angle is selected (*Average* = 0).

5.16 SMOS NRT L1C DUAL POLARIZATION RECONSTRUCTED ŤB SWATH

5.16.1 GENERAL INFORMATION

The L1C products comprise the data obtained in science measurement mode when pointing to the Earth in nominal mode, starting from L1B brightness temperatures Fourier components, performing an inverse FFT and geolocating them in pole-to-pole swaths according to ascending and descending passes. The products include values for geophysical corrections, although they are not applied at this level.

The dual polarization reconstructed brightness temperature swaths are L1C products obtained from MIR_SC_D1B products when pointing to the Earth. They are geolocated in an equal-area grid system (15Km, ISEA 4H9 grid) with reduced spatial resolution over the Ocean (30Km ISEA 4H8 grid), with each point containing several brightness temperature samples on top of the atmosphere (at the antenna reference frame), and also a number of geophysical parameters allowing geophysical corrections in upper processing levels.

Despite their similarity, NRT L1C are not separated into Land and Sea products, instead they are arranged in swaths on a full orbit time interval according to ascending and descending passes. The product contents will be organised in a way as to remove all unnecessary information related to geolocation of overlapping pixels.

5.16.2 TYPE AND SIZE

The following SMOS file types are addressed when referring to NRT L1C Dual Polarization products, with their typical size indicated next to each entry:

- MIR_SCND1C 188 MB

5.16.3 FILENAME

The naming convention for SMOS NRT L1C products is described in detail in [AD. 1].

5.16.4 STRUCTURE

The structure of the SMOS NRT L1C products is elaborated in [AD. 1]. Please refer to this document as the main source for information regarding these files.

5.16.5 GMT CONFIGURATION

In addition to the general parameters which can be defined within a map entry, as part of a GMT configuration file, the following filters are applicable when plotting L1C Dual Polarization products:

- Orbit Orbit orientation
- Polarization Polarization mode
- Field_of_View Field of view
- Target Target incidence angle
- Minimum Minimum incidence angle
- Maximum Maximum incidence angle

In addition the following flag is applicable when plotting L1C Dual Polarization products:

- Average Flag to select whether values are averaged within a product

In particular, the details on these, along with the appropriate values for the product type, the parameter to be plotted, and the overlap resolution policy, are provided below:

X-Path	/GMT_Configuration/Map/Product/Type
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (MIR_SCND1C) are: • **MIR_SCND1C** L1C Dual Polarization Reconstructed ŤB Swath
Description	Type of the SMOS products to be plotted. If products of any other type are present in the input directory, they will be silently ignored by the GMT.

X-Path	/GMT_Configuration/Map/Product/Parameter
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (MIR_SCND1C) are: • **Grid_Point_ID** Unique identifier for the grid point • **Grid_Point_Latitude** Latitude of the DGG cell's center • **Grid_Point_Longitude** Longitude of the DGG cell's center • **Grid_Point_Altitude** Altitude of the DGG cell's center • **BT_Data_Counter** Counter of BT values for the current point • **BT_Value** Brightness temperature • **Pixel_Radiometric_Accuracy** Error accuracy measurement in the BT • **Incidence_Angle** Incidence angle • **Azimuth_Angle** Azimuth angle • **Faraday_Rotation_Angle** Faraday rotation angle • **Geometric_Rotation_Angle** Geometric rotation angle • **Snapshot_ID_of_Pixel** Unique identifier for the snapshot • **Footprint_Axis1** Elliptical footprint major semi-axis value • **Footprint_Axis2** Elliptical footprint major semi-axis value • **Polarisation_Flag** Polarization flag • **SUN_FOV_Flag** Sun field of view flag • **SUN_GLINT_FOV_Flag** Sunglint field of view flag • **MOON_FOV_Flag** Moon field of view flag • **SINGLE_SNAPSHOT_Flag** Single snapshot flag • **FTT_Flag**[11] Flag target transformation flag • **RFI_Flag_V7XX** Radio Frequency Interference flag

[11] Parameter can only be displayed for products produced with versions of the L1P below 700.

	• **SUN_POINT_Flag** Sun point flag • **SUN_GLINT_AREA_Flag** Sunglint area flag • **MOON_POINT_Flag** Moon point flag • **AF_FOV_Flag** Alias Free field of view flag • **EAF_FOV_Flag** Extended Alias Free field of view flag • **BORDER_FOV_Flag** Extended Alias Free border field of view flag • **SUN_TAILS_Flag** Suntails flag • **RFI_Flag**[11] Radio Frequency Interference flag • **RFI_Contamination_Level_Flag** Level of RFI contamination flag • **USGS_Sea_Flag** Sea in the USGS Land-Sea mask • **USGS_Land_Flag** Land in the USGS Land-Sea mask • **USGS_Mixed_Flag** Mixed in the USGS Land-Sea mask • **200km_Coastal_Flag** Distance from the coast of less than 200 Km • **100km_Coastal_Flag** Distance from the coast of less than 100 Km • **40km_Coastal_Flag** Distance from the coast of less than 40 Km • **Min_Sea-Ice_Flag** Pixel is within Minimum Sea-Ice zone • **Max_Sea-Ice_Flag** Pixel is within Maximum Sea-Ice zone • **ST1_ToA** First stokes parameter (total power) • **PI_ToA** Polarization index
Description	Parameter whose data is to be plotted. Further details on their actual meaning, units and interpretation can be found in the respective product specifications ([AD. 1], [AD. 2]).

X-Path	/GMT_Configuration/Map/Product/Overlap
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	Average
Format	The valid values are: • **Average** Average all the values at that bin • **Deviation** Standard deviation at that bin • **Maximum** Maximum value at that bin • **Minimum** Minimum value at that bin • **Oldest** Oldest value at that bin by sensing time • **Latest** Latest value at that bin by sensing time • **Nearest** Nearest measurement with respect to the target angle
Description	Resolution policy that shall be used when the input products, or filtering of the input products, provide multiple values which fall within a given bin of the applicable grid.

X-Path	/GMT_Configuration/Map/Product/Filters/Orbit
Type	String
Occurrences	0 or 1 **Optional**

Units	N/A
Default value	All
Format	The valid values are: • **All** All orbit orientations • **Ascending** Ascending orbit orientation only • **Descending** Descending orbit orientation only
Description	Orbit orientation the products must have in order to be plotted. If a product with an orbit orientation different from the one here specified is encountered, it will be silently ignored.

X-Path	/GMT_Configuration/Map/Product/Filters/Polarization
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	HH(H)
Format	The valid values for this type of product (MIR_SCND1C) are: • **HHH** HHH polarization • **VVV** VVV polarization
Description	Polarization the input data must have in order to be plotted. If data with a polarization different from the one here specified is encountered, it will be silently ignored.

X-Path	/GMT_Configuration/Map/Product/Filters/Field_of_View
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	All
Format	The valid values are: • **All** All • **Alias_Free** Alias Free (minus border) • **Extended_Alias_Free** Extended Alias Free (minus border) • **Border** Border
Description	Field of view the input data must pertain to in order to be plotted. If data from a field of view different from the one here specified is encountered, it will be silently ignored.

X-Path	/GMT_Configuration/Map/Product/Filters/Incidence_Angle/Target
Type	Real
Occurrences	0 or 1 **Optional**
Units	Degrees
Default value	42.5
Format	Any rational number in the range [0.0, 90.0].
Description	Target incidence angle for the filtering of the input data. Whenever multiple data for a pixel is found, which falls within the range defined for the incidence angle, the one closest to this target value will be selected if the Incidence_Angle/Average = 0 option is selected or not specified. Any other value is silently discarded. If data is returned from multiple input products, the Overlap option then defines the policy

	which is applied to these values. If Incidence_Angle/Average = 1 is selected, the target is ignored.

X-Path	/GMT_Configuration/Map/Product/Filters/Incidence_Angle/Minimum
Type	Real
Occurrences	0 or 1 **Optional**
Units	Degrees
Default value	0.0
Format	Any rational number in the range [0.0, 90.0].
Description	Minimum incidence angle for the filtering of the input data. Whenever multiple data for a pixel is found, its incidence angle must be equal or greater than this in order to be considered for further processing. Any other value is silently discarded.

X-Path	/GMT_Configuration/Map/Product/Filters/Incidence_Angle/Maximum
Type	Real
Occurrences	0 or 1 **Optional**
Units	Degrees
Default value	90.0
Format	Any rational number in the range [0.0, 90.0].
Description	Maximum incidence angle for the filtering of the input data. Whenever multiple data for a pixel is found, its incidence angle must be equal or smaller than this in order to be considered for further processing. Any other value is silently discarded.

X-Path	/GMT_Configuration/Map/Product/Filters/Incidence_Angle/Average
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	0
Format	The valid values are: • **0** Use the nearest measurement with respect to the target angle. • **1** Average the values of the data within the specified incidence angle range.
Description	When Average = 1, the data within the incidence angle range defined by Maximum and Minimum is averaged for each input product. When Average = 0, the value nearest to the target is selected for each input product. If data is returned from multiple input products, the Overlap option then defines the policy which is applied to these values.

5.17 SMOS NRT L1C FULL POLARIZATION RECONSTRUCTED ŤB SWATH

5.17.1 GENERAL INFORMATION

The L1C products comprise the data obtained in science measurement mode when pointing to the Earth in nominal mode, starting from L1B brightness temperatures Fourier components, performing an inverse FFT and geolocating them in pole-to-pole swaths according to ascending and descending passes. The products include values for geophysical corrections, although they are not applied at this level.

The full polarization reconstructed brightness temperature swaths are L1C products obtained from MIR_SC_F1B products when pointing to the Earth. They are geolocated in an equal-area grid system (15Km, ISEA 4H9 grid) with reduced spatial resolution over the Ocean (30Km ISEA 4H8 grid), with each point containing several brightness temperature samples on top of the atmosphere (at the antenna reference frame), and also a number of geophysical parameters allowing geophysical corrections in upper processing levels.

Despite their similarity, NRT L1C are not separated into Land and Sea products, instead they are arranged in swaths on a full orbit time interval according to ascending and descending passes. The product contents will be organised in a way as to remove all unnecessary information related to geolocation of overlapping pixels.

5.17.2 TYPE AND SIZE

The following SMOS file types are addressed when referring to NRT L1C Full Polarization products, with their typical size indicated next to each entry:

- MIR_SCNF1C 256 MB

5.17.3 FILENAME

The naming convention for SMOS NRT L1C products is described in detail in [AD. 1].

5.17.4 STRUCTURE

The structure of the SMOS NRT L1C products is elaborated in [AD. 1]. Please refer to this document as the main source for information regarding these files.

5.17.5 GMT CONFIGURATION

In addition to the general parameters which can be defined within a map entry, as part of a GMT configuration file, the following filters are applicable when plotting L1C Full Polarization products:

- Orbit Orbit orientation
- Polarization Polarization mode
- Field_of_View Field of view
- Target Target incidence angle
- Minimum Minimum incidence angle
- Maximum Maximum incidence angle

In addition the following flag is applicable when plotting L1C Dual Polarization products:

- Average Flag to select whether values are averaged within a product

In particular, the details on these, along with the appropriate values for the product type, the parameter to be plotted, and the overlap resolution policy, are provided below:

X-Path	/GMT_Configuration/Map/Product/Type
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (MIR_SCNF1C) are: • **MIR_SCNF1C** L1C Full Polarization Reconstructed ŤB Swath
Description	Type of the SMOS products to be plotted. If products of any other type are present in the input directory, they will be silently ignored by the GMT.

X-Path	/GMT_Configuration/Map/Product/Parameter
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (MIR_SCNF1C) are: • **Grid_Point_ID** Unique identifier for the grid point • **Grid_Point_Latitude** Latitude of the DGG cell's center • **Grid_Point_Longitude** Longitude of the DGG cell's center • **Grid_Point_Altitude** Altitude of the DGG cell's center • **BT_Data_Counter** Counter of BT values for the current point • **BT_Value_Real** Brightness temperature (real component) • **BT_Value_Imag** Brightness temperature (imaginary part) • **Pixel_Radiometric_Accuracy** Error accuracy measurement in the BT • **Incidence_Angle** Incidence angle • **Azimuth_Angle** Azimuth angle • **Faraday_Rotation_Angle** Faraday rotation angle • **Geometric_Rotation_Angle** Geometric rotation angle • **Snapshot_ID_of_Pixel** Unique identifier for the snapshot • **Footprint_Axis1** Elliptical footprint major semi-axis value • **Footprint_Axis2** Elliptical footprint major semi-axis value • **Polarisation_Flag** Polarization flag • **SUN_FOV_Flag** Sun field of view flag • **SUN_GLINT_FOV_Flag** Sunglint field of view flag • **MOON_FOV_Flag** Moon field of view flag • **SINGLE_SNAPSHOT_Flag** Single snapshot flag • **FTT_Flag**[12] Flag target transformation flag • **RFI_Flag_V7XX** Radio Frequency Interference flag

[12] Parameter can only be displayed for products produced with versions of the L1P below 700.

	• **SUN_POINT_Flag** Sun point flag • **SUN_GLINT_AREA_Flag** Sunglint area flag • **MOON_POINT_Flag** Moon point flag • **AF_FOV_Flag** Alias Free field of view flag • **EAF_FOV_Flag** Extended Alias Free field of view flag • **BORDER_FOV_Flag** Extended Alias Free border field of view flag • **SUN_TAILS_Flag** Suntails flag • **RFI_Flag**[12] Radio Frequency Interference flag • **RFI_Contamination_Level_Flag** Level of RFI contamination flag • **USGS_Sea_Flag** Sea in the USGS Land-Sea mask • **USGS_Land_Flag** Land in the USGS Land-Sea mask • **USGS_Mixed_Flag** Mixed in the USGS Land-Sea mask • **200km_Coastal_Flag** Distance from the coast of less than 200 Km • **100km_Coastal_Flag** Distance from the coast of less than 100 Km • **40km_Coastal_Flag** Distance from the coast of less than 40 Km • **Min_Sea-Ice_Flag** Pixel is within Minimum Sea-Ice zone • **Max_Sea-Ice_Flag** Pixel is within Maximum Sea-Ice zone • **ST1_ToA** First stokes parameter (total power) • **PI_ToA** Polarization index • **BT_Module** Module of the cross-polarization BT
Description	Parameter whose data is to be plotted. Further details on their actual meaning, units and interpretation can be found in the respective product specifications ([AD. 1], [AD. 2]).

X-Path	/GMT_Configuration/Map/Product/Overlap
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	Average
Format	The valid values are: • **Average** Average all the values at that bin • **Deviation** Standard deviation at that bin • **Maximum** Maximum value at that bin • **Minimum** Minimum value at that bin • **Oldest** Oldest value at that bin by sensing time • **Latest** Latest value at that bin by sensing time • **Nearest** The nearest measurement with respect to the target angle
Description	Resolution policy that shall be used when the input products, or filtering of the input products, provide multiple values which fall within a given bin of the applicable grid.

X-Path	/GMT_Configuration/Map/Product/Filters/Orbit
Type	String

Occurrences	0 or 1 **Optional**
Units	N/A
Default value	All
Format	The valid values are: • **All** All orbit orientations • **Ascending** Ascending orbit orientation only • **Descending** Descending orbit orientation only
Description	Orbit orientation the products must have in order to be plotted. If a product with an orbit orientation different from the one here specified is encountered, it will be silently ignored.

X-Path	/GMT_Configuration/Map/Product/Filters/Polarization
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	HH(H)
Format	The valid values for this type of product (MIR_SCNF1C) are: • **HHH** HHH polarization • **VVV** VVV polarization • **HHV** HHV, HVH or VHH polarization • **VVH** VVH, VHV or HVV polarization • HHV_VVH HHV or VVH polarizations (polarization option used to map T3 and T4)
Description	Polarization the input data must have in order to be plotted. If data with a polarization different from the one here specified is encountered, it will be silently ignored.

X-Path	/GMT_Configuration/Map/Product/Filters/Field_of_View
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	All
Format	The valid values are: • **All** All • **Alias_Free** Alias Free (minus border) • **Extended_Alias_Free** Extended Alias Free (minus border) • **Border** Border
Description	Field of view the input data must pertain to in order to be plotted. If data from a field of view different from the one here specified is encountered, it will be silently ignored.

X-Path	/GMT_Configuration/Map/Product/Filters/Incidence_Angle/Target
Type	Real
Occurrences	0 or 1 **Optional**
Units	Degrees

Default value	42.5
Format	Any rational number in the range [0.0, 90.0].
Description	Target incidence angle for the filtering of the input data. Whenever multiple data for a pixel is found, which falls within the range defined for the incidence angle, the one closest to this target value will be selected if the Incidence_Angle/Average = 0 option is selected or not specified. Any other value is silently discarded. If data is returned from multiple input products, the Overlap option then defines the policy which is applied to these values. If Incidence_Angle/Average= = 1 is selected, the target is ignored.

X-Path	/GMT_Configuration/Map/Product/Filters/Incidence_Angle/Minimum
Type	Real
Occurrences	0 or 1 **Optional**
Units	Degrees
Default value	0.0
Format	Any rational number in the range [0.0, 90.0].
Description	Minimum incidence angle for the filtering of the input data. Whenever multiple data for a pixel is found, its incidence angle must be equal or greater than this in order to be considered for further processing. Any other value is silently discarded.

X-Path	/GMT_Configuration/Map/Product/Filters/Incidence_Angle/Maximum
Type	Real
Occurrences	0 or 1 **Optional**
Units	Degrees
Default value	90.0
Format	Any rational number in the range [0.0, 90.0].
Description	Maximum incidence angle for the filtering of the input data. Whenever multiple data for a pixel is found, its incidence angle must be equal or smaller than this in order to be considered for further processing. Any other value is silently discarded.

X-Path	/GMT_Configuration/Map/Product/Filters/Incidence_Angle/Average
Type	Integer
Occurrences	0 or 1 **Optional**
Units	NA
Default value	0
Format	The valid values are 0 or 1.
Description	The *Average* option selects whether the measurements whose incidence angle is inside the defined ranges are averaged (*Average* = 1) or if the nearest measurement with respect to the target angle is selected (*Average* = 0).

5.18 SMOS L2 OCEAN SALINITY DATA ANALYSIS PRODUCTS

5.18.1 GENERAL INFORMATION

The SMOS L2 SSS processor generates two types of products:

- The Level 2 Ocean Salinity User Data Product (MIR_OSUDP2) is designed for oceanographers and high level processing centers. It includes geophysical parameters, a theoretical estimate of their accuracy and flags and descriptors for the product quality.
- The Level 2 Ocean Salinity Data Analysis Product: more information, for quality control and advanced users, are available in the Data Analysis Report (MIR_OSDAP2).

The SMOS L2 SSS processor derives one geophysical parameter, the Sea Surface Salinity. The iterative retrieval method that is implemented in the processor is able to derive some information on other geophysical parameters depending on the forward model used in the iterative scheme. The forward model accounts for main contributions to the measurements. For one of these contributions, the one due to the roughness of sea surface, three sub-models are implemented in parallel in the processor. For this reason, most geophysical parameters in the output products are repeated three times.

5.18.2 TYPE AND SIZE

The following SMOS file types are addressed when referring to L2 Ocean Salinity Data Analysis products, with their typical size indicated next to each entry:

- MIR_OSDAP2 107,57 MB

5.18.3 FILENAME

The naming convention for SMOS L2 products is described in detail in [AD. 2].

5.18.4 STRUCTURE

The structure of the SMOS L2 products is elaborated in [AD. 2]. Please refer to this document as the main source for information regarding these files.

5.18.5 GMT CONFIGURATION

In addition to the general parameters which can be defined within a map entry, as part of a GMT configuration file, the following filters are applicable when plotting L2 Ocean Salinity Data Analysis products:

- Orbit Orbit orientation
- Fill_Value Value used to indicate the absence of valid data

In particular, the details on these, along with the appropriate values for the product type, the parameter to be plotted, and the overlap resolution policy, are provided below:

X-Path	/GMT_Configuration/Map/Product/Type
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A

Format	The valid values for this type of product (MIR_OSDAP2) are: • **MIR_OSDAP2** L2 Ocean Salinity Data Analysis Products
Description	Type of the SMOS products to be plotted. If products of any other type are present in the input directory, they will be silently ignored by the GMT.

X-Path	/GMT_Configuration/Map/Product/Parameter
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (MIR_OSDAP2) are: • **Grid_Point_ID** Unique identifier for the grid point • **Latitude** Latitude of the DGG cell's center • **Longitude** Longitude of the DGG cell's center • **X_swath**[13] Grid point distances from the satellite tracks • **Dg_num_outliers** Number of outlier measurements discarded • **Dg_num_high_resol** Number of measurements discarded • **Dg_RFI_L1**[13] Number of measurements discarded • **Dg_sunglint_L1** Number of measurements discarded • **Tau** Atmospheric optical depth at nadir • **TBatm_emission** Atmospheric emission toward sensor • **Param1_prior_M1** Prior of parameter for forward model 1 • **Param1_sigma_prior_M1** Sigma of parameter for forward model 1 • **Param2_prior_M1** Prior of parameter for forward model 1 • **Param2_sigma_prior_M1** Sigma of parameter for forward model 1 • **Param3_prior_M1** Prior of parameter for forward model 1 • **Param3_sigma_prior_M1** Sigma of parameter for forward model 1 • **Param4_prior_M1** Prior of parameter for forward model 1 • **Param4_sigma_prior_M1** Sigma of parameter for forward model 1 • **Param5_prior_M1** Prior of parameter for forward model 1 • **Param5_sigma_prior_M1** Sigma of parameter for forward model 1 • **Param6_prior_M1** Prior of parameter for forward model 1 • **Param6_sigma_prior_M1** Sigma of parameter for forward model 1 • **Param7_prior_M1** Prior of parameter for forward model 1 • **Param7_sigma_prior_M1** Sigma of parameter for forward model 1 • **Param1_prior_M2** Prior of parameter for forward model 2 • **Param1_sigma_prior_M2** Sigma of parameter for forward model 2 • **Param2_prior_M2** Prior of parameter for forward model 2 • **Param2_sigma_prior_M2** Sigma of parameter for forward model 2

[13] Parameter is only possible to be displayed for products generated with schema version 300.

	• **Param3_prior_M2** Prior of parameter for forward model 2 • **Param3_sigma_prior_M2** Sigma of parameter for forward model 2 • **Param4_prior_M2** Prior of parameter for forward model 2 • **Param4_sigma_prior_M2** Sigma of parameter for forward model 2 • **Param5_prior_M2** Prior of parameter for forward model 2 • **Param5_sigma_prior_M2** Sigma of parameter for forward model 2 • **Param6_prior_M2** Prior of parameter for forward model 2 • **Param6_sigma_prior_M2** Sigma of parameter for forward model 2 • **Param7_prior_M2** Prior of parameter for forward model 2 • **Param7_sigma_prior_M2** Sigma of parameter for forward model 2 • **Param1_prior_M3** Prior of parameter for forward model 3 • **Param1_sigma_prior_M3** Sigma of parameter for forward model 3 • **Param2_prior_M3** Prior of parameter for forward model 3 • **Param2_sigma_prior_M3** Sigma of parameter for forward model 3 • **Param3_prior_M3** Prior of parameter for forward model 3 • **Param3_sigma_prior_M3** Sigma of parameter for forward model 3 • **Param4_prior_M3** Prior of parameter for forward model 3 • **Param4_sigma_prior_M3** Sigma of parameter for forward model 3 • **Param5_prior_M3** Prior of parameter for forward model 3 • **Param5_sigma_prior_M3** Sigma of parameter for forward model 3 • **Param6_prior_M3** Prior of parameter for forward model 3 • **Param6_sigma_prior_M3** Sigma of parameter for forward model 3 • **Param7_prior_M3** Prior of parameter for forward model 3 • **Param7_sigma_prior_M3** Sigma of parameter for forward model 3 • **Param1_prior_M4** Prior of parameter for forward model 4 • **Param1_sigma_prior_M4** Sigma of parameter for forward model 4 • **Param2_prior_M4** Prior of parameter for forward model 4 • **Param2_sigma_prior_M4** Sigma of parameter for forward model 4 • **Param3_prior_M4** Prior of parameter for forward model 4 • **Param3_sigma_prior_M4** Sigma of parameter for forward model 4 • **Param4_prior_M4** Prior of parameter for forward model 4 • **Param4_sigma_prior_M4** Sigma of parameter for forward model 4 • **Param5_prior_M4** Prior of parameter for forward model 4 • **Param5_sigma_prior_M4** Sigma of parameter for forward model 4 • **Param6_prior_M4** Prior of parameter for forward model 4 • **Param6_sigma_prior_M4** Sigma of parameter for forward model 4 • **Param7_prior_M4** Prior of parameter for forward model 4 • **Param7_sigma_prior_M4** Sigma of parameter for forward model 4 • **Param1_M1** Value of parameter for forward model 1 • **Param1_sigma_M1** Uncertainty of parameter for forward model 1 • **Param2_M1** Value of parameter for forward model 1

	• **Param2_sigma_M1**	Uncertainty of parameter for forward model 1
	• **Param3_M1**	Value of parameter for forward model 1
	• **Param3_sigma_M1**	Uncertainty of parameter for forward model 1
	• **Param4_M1**	Value of parameter for forward model 1
	• **Param4_sigma_M1**	Uncertainty of parameter for forward model 1
	• **Param5_M1**	Value of parameter for forward model 1
	• **Param5_sigma_M1**	Uncertainty of parameter for forward model 1
	• **Param6_M1**	Value of parameter for forward model 1
	• **Param6_sigma_M1**	Uncertainty of parameter for forward model 1
	• **Param7_M1**	Value of parameter for forward model 1
	• **Param7_sigma_M1**	Uncertainty of parameter for forward model 1
	• **Param1_M2**	Value of parameter for forward model 2
	• **Param1_sigma_M2**	Uncertainty of parameter for forward model 2
	• **Param2_M2**	Value of parameter for forward model 2
	• **Param2_sigma_M2**	Uncertainty of parameter for forward model 2
	• **Param3_M2**	Value of parameter for forward model 2
	• **Param3_sigma_M2**	Uncertainty of parameter for forward model 2
	• **Param4_M2**	Value of parameter for forward model 2
	• **Param4_sigma_M2**	Uncertainty of parameter for forward model 2
	• **Param5_M2**	Value of parameter for forward model 2
	• **Param5_sigma_M2**	Uncertainty of parameter for forward model 2
	• **Param6_M2**	Value of parameter for forward model 2
	• **Param6_sigma_M2**	Uncertainty of parameter for forward model 2
	• **Param7_M2**	Value of parameter for forward model 2
	• **Param7_sigma_M2**	Uncertainty of parameter for forward model 2
	• **Param1_M3**	Value of parameter for forward model 3
	• **Param1_sigma_M3**	Uncertainty of parameter for forward model 3
	• **Param2_M3**	Value of parameter for forward model 3
	• **Param2_sigma_M3**	Uncertainty of parameter for forward model 3
	• **Param3_M3**	Value of parameter for forward model 3
	• **Param3_sigma_M3**	Uncertainty of parameter for forward model 3
	• **Param4_M3**	Value of parameter for forward model 3
	• **Param4_sigma_M3**	Uncertainty of parameter for forward model 3
	• **Param5_M3**	Value of parameter for forward model 3
	• **Param5_sigma_M3**	Uncertainty of parameter for forward model 3
	• **Param6_M3**	Value of parameter for forward model 3
	• **Param6_sigma_M3**	Uncertainty of parameter for forward model 3
	• **Param7_M3**	Value of parameter for forward model 3
	• **Param7_sigma_M3**	Uncertainty of parameter for forward model 3
	• **Param1_M4**	Value of parameter for forward model 4
	• **Param1_sigma_M4**	Uncertainty of parameter for forward model 4

	• **Param2_M4** Value of parameter for forward model 4 • **Param2_sigma_M4** Uncertainty of parameter for forward model 4 • **Param3_M4** Value of parameter for forward model 4 • **Param3_sigma_M4** Uncertainty of parameter for forward model 4 • **Param4_M4** Value of parameter for forward model 4 • **Param4_sigma_M4** Uncertainty of parameter for forward model 4 • **Param5_M4** Value of parameter for forward model 4 • **Param5_sigma_M4** Uncertainty of parameter for forward model 4 • **Param6_M4** Value of parameter for forward model 4 • **Param6_sigma_M4** Uncertainty of parameter for forward model 4 • **Param7_M4** Value of parameter for forward model 4 • **Param7_sigma_M4** Uncertainty of parameter for forward model 4 • **Dg_num_meas_l1c** Number of measurements in the L1C product • **Diff_TB_1** Differences in forward model 1 • **Diff_TB_2** Differences in forward model 2 • **Diff_TB_3** Differences in forward model 3 • **Diff_TB_4** Differences in cardioid model • **TB_gal_H** Effective galactic noise in H polarisation • **TB_gal_V** Effective galactic noise in V polarisation • **Fg_oor_LUTroug1_SST_1**[14] SST value falls outside acceptable limits • **Fg_oor_LUTroug1_SST_2** SST value falls outside acceptable limits • **Fg_oor_LUTroug1_SST_3** SST value falls outside acceptable limits • **Fg_oor_LUTroug1_SST_4** SST value falls outside acceptable limits • **Fg_oor_LUTroug1_SSS_1** SSS value falls outside acceptable limits • **Fg_oor_LUTroug1_SSS_2** SSS value falls outside acceptable limits • **Fg_oor_LUTroug1_SSS_3** SSS value falls outside acceptable limits • **Fg_oor_LUTroug1_SSS_4** SSS value falls outside acceptable limits • **Fg_oor_LUTroug1_WS_1** WS value falls outside acceptable limits • **Fg_oor_LUTroug1_WS_2** WS value falls outside acceptable limits • **Fg_oor_LUTroug1_WS_3** WS value falls outside acceptable limits • **Fg_oor_LUTroug1_WS_4** WS value falls outside acceptable limits • **Fg_oor_LUTroug1_theta_1** Theta value falls outside acceptable limits • **Fg_oor_LUTroug1_theta_2** Theta value falls outside acceptable limits • **Fg_oor_LUTroug1_theta_3** Theta value falls outside acceptable limits • **Fg_oor_LUTroug1_theta_4** Theta value falls outside acceptable limits • **Fg_oor_LUTroug2_SST_1** SST value falls outside acceptable limits • **Fg_oor_LUTroug2_SST_2** SST value falls outside acceptable limits • **Fg_oor_LUTroug2_SST_3** SST value falls outside acceptable limits

[14] OSDAP2 products contain four blocks of out of range flags, one for each model defined. Given that the names of the flags within each of these is similar, a subscript is appended to each identifier to differentiate the particular model the flag refers to: _1 (model 1), _2 (model 2), _3 (model 3), _4 (model 4)

	• **Fg_oor_LUTroug2_SST_4** SST value falls outside acceptable limits • **Fg_oor_LUTroug2_SSS_1** SSS value falls outside acceptable limits • **Fg_oor_LUTroug2_SSS_2** SSS value falls outside acceptable limits • **Fg_oor_LUTroug2_SSS_3** SSS value falls outside acceptable limits • **Fg_oor_LUTroug2_SSS_4** SSS value falls outside acceptable limits • **Fg_oor_LUTroug2_theta_1** Theta value falls outside acceptable limits • **Fg_oor_LUTroug2_theta_2** Theta value falls outside acceptable limits • **Fg_oor_LUTroug2_theta_3** Theta value falls outside acceptable limits • **Fg_oor_LUTroug2_theta_4** Theta value falls outside acceptable limits • **Fg_oor_LUTroug2_Ust_1** UST value falls outside acceptable limits • **Fg_oor_LUTroug2_Ust_2** UST value falls outside acceptable limits • **Fg_oor_LUTroug2_Ust_3** UST value falls outside acceptable limits • **Fg_oor_LUTroug2_Ust_4** UST value falls outside acceptable limits • **Fg_oor_LUTroug2_omega_1** Omega value falls outside acceptable limits • **Fg_oor_LUTroug2_omega_2** Omega value falls outside acceptable limits • **Fg_oor_LUTroug2_omega_3** Omega value falls outside acceptable limits • **Fg_oor_LUTroug2_omega_4** Omega value falls outside acceptable limits • **Fg_oor_LUT_gam1_ra_1** Right asc. value falls outside acceptable limits • **Fg_oor_LUT_gam1_ra_2** Right asc. value falls outside acceptable limits • **Fg_oor_LUT_gam1_ra_3** Right asc. value falls outside acceptable limits • **Fg_oor_LUT_gam1_ra_4** Right asc. value falls outside acceptable limits • **Fg_oor_LUT_gam1_dec_1** Dec. value falls outside acceptable limits • **Fg_oor_LUT_gam1_dec_2** Dec. value falls outside acceptable limits • **Fg_oor_LUT_gam1_dec_3** Dec. value falls outside acceptable limits • **Fg_oor_LUT_gam1_dec_4** Dec. value falls outside acceptable limits • **Fg_oor_LUTsunglint_thetasun_1** Sun value outside acceptable limits • **Fg_oor_LUTsunglint_thetasun_2** Sun value outside acceptable limits • **Fg_oor_LUTsunglint_thetasun_3** Sun value outside acceptable limits • **Fg_oor_LUTsunglint_thetasun_4** Sun value outside acceptable limits • **Fg_oor_LUTsunglint_phismos_1** Phismos outside acceptable limits • **Fg_oor_LUTsunglint_phismos_2** Phismos outside acceptable limits • **Fg_oor_LUTsunglint_phismos_3** Phismos outside acceptable limits • **Fg_oor_LUTsunglint_phismos_4** Phismos outside acceptable limits • **Fg_oor_LUTsunglint_theta_1** Theta value falls outside acceptable limits • **Fg_oor_LUTsunglint_theta_2** Theta value falls outside acceptable limits • **Fg_oor_LUTsunglint_theta_3** Theta value falls outside acceptable limits • **Fg_oor_LUTsunglint_theta_4** Theta value falls outside acceptable limits • **Fg_oor_LUTsunglint_WS_1** WS value falls outside the acceptable limits • **Fg_oor_LUTsunglint_WS_2** WS value falls outside the acceptable limits • **Fg_oor_LUTsunglint_WS_3** WS value falls outside the acceptable limits • **Fg_oor_LUTsunglint_WS_4** WS value falls outside the acceptable limits

	• **Fg_oor_LUTfoam_WS_1**	WS value falls outside acceptable limits
	• **Fg_oor_LUTfoam_WS_2**	WS value falls outside acceptable limits
	• **Fg_oor_LUTfoam_WS_3**	WS value falls outside acceptable limits
	• **Fg_oor_LUTfoam_WS_4**	WS value falls outside acceptable limits
	• **Fg_oor_LUTfoam_Tseaair_1**	Tsea_air value falls outside acceptable limits
	• **Fg_oor_LUTfoam_Tseaair_2**	Tsea_air value falls outside acceptable limits
	• **Fg_oor_LUTfoam_Tseaair_3**	Tsea_air value falls outside acceptable limits
	• **Fg_oor_LUTfoam_Tseaair_4**	Tsea_air value falls outside acceptable limits
	• **Fg_oor_LUTfoam_SSS_1**	SSS value falls outside acceptable limits
	• **Fg_oor_LUTfoam_SSS_2**	SSS value falls outside acceptable limits
	• **Fg_oor_LUTfoam_SSS_3**	SSS value falls outside acceptable limits
	• **Fg_oor_LUTfoam_SSS_4**	SSS value falls outside acceptable limits
	• **Fg_oor_LUTfoam_SST_1**	SST value falls outside acceptable limits
	• **Fg_oor_LUTfoam_SST_2**	SST value falls outside acceptable limits
	• **Fg_oor_LUTfoam_SST_3**	SST value falls outside acceptable limits
	• **Fg_oor_LUTfoam_SST_4**	SST value falls outside acceptable limits
	• **Fg_oor_LUTfoam_theta_1**	Theta value falls outside acceptable limits
	• **Fg_oor_LUTfoam_theta_2**	Theta value falls outside acceptable limits
	• **Fg_oor_LUTfoam_theta_3**	Theta value falls outside acceptable limits
	• **Fg_oor_LUTfoam_theta_4**	Theta value falls outside acceptable limits
	• **Fg_oor_gam2_dec_1**	Dec went out of LUT range during retrieval
	• **Fg_oor_gam2_dec_2**	Dec went out of LUT range during retrieval
	• **Fg_oor_gam2_dec_3**	Dec went out of LUT range during retrieval
	• **Fg_oor_gam2_dec_4**	Dec went out of LUT range during retrieval
	• **Fg_oor_gam2_ra_1**	Ra went out of LUT range during retrieval
	• **Fg_oor_gam2_ra_2**	Ra went out of LUT range during retrieval
	• **Fg_oor_gam2_ra_3**	Ra went out of LUT range during retrieval
	• **Fg_oor_gam2_ra_4**	Ra went out of LUT range during retrieval
	• **Fg_oor_gam2_WSn_1**	WSn went out of LUT range during retrieval
	• **Fg_oor_gam2_WSn_2**	WSn went out of LUT range during retrieval
	• **Fg_oor_gam2_WSn_3**	WSn went out of LUT range during retrieval
	• **Fg_oor_gam2_WSn_4**	WSn went out of LUT range during retrieval
	• **Fg_oor_gam2_tetha_1**	Theta went out of LUT range during retrieval
	• **Fg_oor_gam2_tetha_2**	Theta went out of LUT range during retrieval
	• **Fg_oor_gam2_tetha_3**	Theta went out of LUT range during retrieval
	• **Fg_oor_gam2_tetha_4**	Theta went out of LUT range during retrieval
	• **Fg_oor_gam2_psi_1**	Psi went out of LUT range during retrieval
	• **Fg_oor_gam2_psi_2**	Psi went out of LUT range during retrieval
	• **Fg_oor_gam2_psi_3**	Psi went out of LUT range during retrieval
	• **Fg_oor_gam2_psi_4**	Psi went out of LUT range during retrieval
	• **Fg_oor_LUTAGDPT_lat_1**	Latitude value falls outside acceptable limits

- **Fg_oor_LUTAGDPT_lat_2** Latitude value falls outside acceptable limits
- **Fg_oor_LUTAGDPT_lat_3** Latitude value falls outside acceptable limits
- **Fg_oor_LUTAGDPT_lat_4** Latitude value falls outside acceptable limits
- **Fg_oor_LUTAGDPT_lon_1** Longitude value falls outside acceptable limits
- **Fg_oor_LUTAGDPT_lon_2** Longitude value falls outside acceptable limits
- **Fg_oor_LUTAGDPT_lon_3** Longitude value falls outside acceptable limits
- **Fg_oor_LUTAGDPT_lon_4** Longitude value falls outside acceptable limits
- **Fg_oor_LUTAGDPT_month_1** Acquisition time falls outside acceptable limits
- **Fg_oor_LUTAGDPT_month_2** Acquisition time falls outside acceptable limits
- **Fg_oor_LUTAGDPT_month_3** Acquisition time falls outside acceptable limits
- **Fg_oor_LUTAGDPT_month_4** Acquisition time falls outside acceptable limits
- **Fg_oor_LUTAGDPT_param_1** Param value falls outside acceptable limits
- **Fg_oor_LUTAGDPT_param_2** Param value falls outside acceptable limits
- **Fg_oor_LUTAGDPT_param_3** Param value falls outside acceptable limits
- **Fg_oor_LUTAGDPT_param_4** Param value falls outside acceptable limits
- **Fm_suspect_ice** Difference between TB and model too high
- **Fm_l1c_error** Whether L1C BT value is invalid (e.g. NaN)
- **Fm_out_of_range** Difference between TB and model too high
- **Fm_fara_interp** Whether TEC was interpolated from AUX_FARA_x
- **Fm_l1c_sun** From sunglint L1C flags
- **Fm_high_sun_glint** Sun glint flag
- **Fm_low_sun_glint** Sun glint flag
- **Fm_moon_spec_dir** Specular direction close to target to Moon dir.
- **Fm_gal_noise_error** Uncertainty on galactic noise source is large
- **Fm_high_gal_noise** High galactic noise flag
- **Fm_gal_noise_pol** High polarised galactic noise flag
- **Fm_outlier** If true, outlier measurement
- **Fm_resol** Size of the footprint ellipse is too big
- **Fm_valid** Measurement is valid
- **Fm_lost_data** Unused due to lack of companion polarisation
- **Fm_keepXpol** Keep BT in X polarization direction
- **Fm_keepYpol** Keep BT in Y polarization direction
- **Fm_keepST34** Keep Stokes 3 (real part) and Stokes 4 (imag. part)

Plottable parameters since version 402 onwards:

- **Fg_Oor_LUT_rough_dim1_R1** SST value falls outside the acceptable limits
- **Fg_Oor_LUT_rough_dim2_R1** SST value falls outside the acceptable limits
- **Fg_Oor_LUT_rough_dim3_R1** SST value falls outside the acceptable limits
- **Fg_Oor_LUT_rough_dim4_R1** SST value falls outside the acceptable limits
- **Fg_Oor_LUT_rough_dim5_R1** SST value falls outside the acceptable limits
- **Fg_oor_LUT_gam1_ra_R1** Ascension value falls outside the acceptable limits

	• **Fg_oor_LUT_gam1_dec_R1** Declination value falls outside the acceptable limits • **Fg_oor_LUTsunglint_thetasun_R1** Theta Sun value falls outside the acceptable limits • **Fg_oor_LUTsunglint_phismos_R1** Phi value falls outside the acceptable limits • **Fg_oor_LUTsunglint_theta_R1** Theta value falls outside the acceptable limits • **Fg_oor_LUTsunglint_WS_R1** Sunglint WS value falls outside the acceptable interval limits • **Fg_oor_LUTfoam_WS_R1** Foam WS value falls outside the acceptable interval limits • **Fg_oor_LUTfoam_Tseaair_R1** Tsea_air value falls outside the acceptable interval limits • **Fg_oor_LUTfoam_SSS_R1** SSS value falls outside the acceptable interval limits • **Fg_oor_LUTfoam_SST_R1** SST value falls outside the acceptable interval limits • **Fg_oor_LUTfoam_theta**_R1 Foam Theta value falls outside the acceptable interval limits • **Fg_oor_gam2_dec_R1** Declination went out of LUT range during retrieval • **Fg_oor_gam2_ra_R1** Ascension went out of LUT range during retrieval • **Fg_oor_gam2_WSn_R1** WSn went out of LUT range during retrieval • **Fg_oor_gam2_theta_R1** Theta went out of LUT range during retrieval • **Fg_oor_gam2_psi_R1** Psi went out of LUT range during retrieval • **Fg_Oor_LUT_rough_dim1_R2** SST value falls outside the acceptable limits • **Fg_Oor_LUT_rough_dim2_R2** SST value falls outside the acceptable limits • **Fg_Oor_LUT_rough_dim3_R2** SST value falls outside the acceptable limits • **Fg_Oor_LUT_rough_dim4_R2** SST value falls outside the acceptable limits • **Fg_Oor_LUT_rough_dim5_R2** SST value falls outside the acceptable limits • **Fg_oor_LUT_gam1_ra_R2** Ascension went out of LUT range during retrieval • **Fg_oor_LUT_gam1_dec_R2** Declination went out of LUT range during retrieval • **Fg_oor_LUTsunglint_thetasun_R2** Theta Sun value falls outside the acceptable limits • **Fg_oor_LUTsunglint_phismos_R2** Phi value falls outside the acceptable limits • **Fg_oor_LUTsunglint_theta_R2** Theta value falls outside the acceptable limits • **Fg_oor_LUTsunglint_WS_R2** Sunglint WS value falls outside the acceptable interval limits • **Fg_oor_LUTfoam_WS_R2** Foam WS value falls outside the acceptable interval limits • **Fg_oor_LUTfoam_Tseaair_R2** Tsea_air value falls outside the acceptable interval limits • **Fg_oor_LUTfoam_SSS_R2** SSS value falls outside the acceptable interval limits • **Fg_oor_LUTfoam_SST_R2** SST value fall outside the acceptable interval limits • **Fg_oor_LUTfoam_theta_R2** Foam Theta value falls outside the acceptable interval limits • **Fg_oor_gam2_dec_R2** Declination went out of LUT range during retrieval • **Fg_oor_gam2_ra_R2** Ascension went out of LUT range during retrieval • **Fg_oor_gam2_WSn_R2** WSn went out of LUT range during retrieval • **Fg_oor_gam2_theta_R2** Theta went out of LUT range during retrieval • **Fg_oor_gam2_psi_R2** Psi went out of LUT range during retrieval • **Fg_Oor_LUT_rough_dim1_R3** SST value falls outside the acceptable limits • **Fg_Oor_LUT_rough_dim2_R3** SST value falls outside the acceptable limits • **Fg_Oor_LUT_rough_dim3_R3** SST value falls outside the acceptable limits • **Fg_Oor_LUT_rough_dim4_R3** SST value falls outside the acceptable limits • **Fg_Oor_LUT_rough_dim5_R3** SST value falls outside the acceptable limits

	• **Fg_oor_LUT_gam1_ra_R3** Ascension went out of LUT range during retrieval • **Fg_oor_LUT_gam1_dec_R3** Declination went out of LUT range during retrieval • **Fg_oor_LUTsunglint_thetasun_R3** Theta Sun value falls outside the acceptable limits • **Fg_oor_LUTsunglint_phismos_R3** Phi value falls outside the acceptable limits • **Fg_oor_LUTsunglint_theta_R3** Theta value falls outside the acceptable limits • **Fg_oor_LUTsunglint_WS_R3** Sunglint WS value falls outside the acceptable interval limits • **Fg_oor_LUTfoam_WS_R3** Foam WS value falls outside the acceptable interval limits • **Fg_oor_LUTfoam_Tseaair_R3** Tsea_air value falls outside the acceptable interval limits • **Fg_oor_LUTfoam_SSS_R3** SSS value falls outside the acceptable interval limits • **Fg_oor_LUTfoam_SST_R3** SST value falls outside the acceptable interval limits • **Fg_oor_LUTfoam_theta_R3** Foam Theta value falls outside the acceptable interval limits • **Fg_oor_gam2_dec_R3** Declination went out of LUT range during retrieval • **Fg_oor_gam2_ra_R3** Ascension went out of LUT range during retrieval • **Fg_oor_gam2_WSn_R3** WSn went out of LUT range during retrieval • **Fg_oor_gam2_theta_R3** Theta went out of LUT range during retrieval • **Fg_oor_gam2_psi_R3** Psi went out of LUT range during retrieval • **Fg_Oor_LUT_rough_dim1_R4** SST value falls outside the acceptable limits • **Fg_Oor_LUT_rough_dim2_R4** SST value falls outside the acceptable limits • **Fg_Oor_LUT_rough_dim3_R4** SST value falls outside the acceptable limits • **Fg_Oor_LUT_rough_dim4_R4** SST value falls outside the acceptable limits • **Fg_Oor_LUT_rough_dim5_R4** SST value falls outside the acceptable limits • **Fg_oor_LUT_gam1_ra_R4** Ascension went out of LUT range during retrieval • **Fg_oor_LUT_gam1_dec_R4** Declination went out of LUT range during retrieval • **Fg_oor_LUTsunglint_thetasun_R4** Theta Sun value falls outside the acceptable limits • **Fg_oor_LUTsunglint_phismos_R4** Phi value falls outside the acceptable limits • **Fg_oor_LUTsunglint_theta_R4** Theta value falls outside the acceptable limits • **Fg_oor_LUTsunglint_WS_R4** Sunglint WS value falls outside the acceptable interval limits • **Fg_oor_LUTfoam_WS_R4** Foam WS value falls outside the acceptable interval limits • **Fg_oor_LUTfoam_Tseaair_R4** Tsea_air value falls outside the acceptable interval limits • **Fg_oor_LUTfoam_SSS_R4** SSS value falls outside the acceptable interval limits • **Fg_oor_LUTfoam_SST_R4** SST value falls outside the acceptable interval limits • **Fg_oor_LUTfoam_theta_R4** Foam Theta value falls outside the acceptable interval limits • **Fg_oor_gam2_dec_R4** Declination went out of LUT range during retrieval • **Fg_oor_gam2_ra_R4** Ascension went out of LUT range during retrieval • **Fg_oor_gam2_WSn_R4** WSn went out of LUT range during retrieval • **Fg_oor_gam2_theta_R4** Theta went out of LUT range during retrieval • **Fg_oor_gam2_psi_R4** Psi went out of LUT range during retrieval • **Dg_af_fov** Number of valid measurements with AF_FOV flag raised • **Dg_user** Number of measurements matching user filter in AUX_CNFOSF/D • **Param1_prior_R1** Prior descriptors & flags for 1st mapped retrieval configuration • **Param1_sigma_prior_R1** Sigma descriptors & flags for 1st mapped retrieval configuration

	• **Param2_prior_R1** Prior descriptors & flags for 1st mapped retrieval configuration • **Param2_sigma_prior_R1** Sigma descriptors & flags for 1st mapped retrieval configuration • **Param3_prior_R1** Prior descriptors & flags for 1st mapped retrieval configuration • **Param3_sigma_prior_R1** Sigma descriptors & flags for 1st mapped retrieval configuration • **Param4_prior_R1** Prior descriptors & flags for 1st mapped retrieval configuration • **Param4_sigma_prior_R1** Sigma descriptors & flags for 1st mapped retrieval configuration • **Param5_prior_R1** Prior descriptors & flags for 1st mapped retrieval configuration • **Param5_sigma_prior_R1** Sigma descriptors & flags for 1st mapped retrieval configuration • **Param6_prior_R1** Prior descriptors & flags for 1st mapped retrieval configuration • **Dg_LSC_R1** Dwell-line mean of absolute value of land-sea correction • **Fg_sc_land_sea_coast1_R1** Sea distance to coast • **Fg_sc_land_sea_coast2_R1** Sea distance to coast • **Fg_sc_TEC_gradient_R1** High TEC gradient along dwell for a grid point • **Fg_sc_in_clim_ice_R1** Maximum Sea Ice extension according to monthly climatology • **Fg_sc_ice_R1** Ice concentration above Tg_ice_concentration threshold • **Fg_sc_suspect_ice_R1** Suspected ice • **Fg_sc_rain_R1** Heavy rain suspected above Tg_max_rainfall threshold • **Fg_sc_high_wind_R1** Suspected High wind • **Fg_sc_low_wind_R1** Suspected Low wind • **Fg_sc_high_SST_R1** Suspected High SST • **Fg_sc_low_SST_R1** Suspected Low SST • **Fg_sc_high_SSS_R1** Suspected High SSS • **Fg_sc_low_SSS_R1** Suspected Low SSS • **Fg_sc_sea_state_1_R1** Sea state class 1 • **Fg_sc_sea_state_2_R1** Sea state class 2 • **Fg_sc_sea_state_3_R1** Sea state class 3 • **Fg_sc_sea_state_4_R1** Sea state class 4 • **Fg_sc_sea_state_5_R1** Sea state class 5 • **Fg_sc_sea_state_6_R1** Sea state class 6 • **Fg_sc_sst_front_R1** Suspected SST front • **Fg_sc_sss_front_R1** Suspected SST front • **Fg_sc_ice_Acard_R1** Ice flag from cardioid • **Fg_sc_ecmwf_land_R1** Suspected ECMWF land • **Fg_ctrl_ignore_R1** Not processed • **Fg_ctrl_range_R1** Retrieved values outside range using Forward model 1 • **Fg_ctrl_sigma_R1** High retrieval sigma using forward model 1 • **Fg_ctrl_chi2_R1** Poor fit quality • **Fg_ctrl_chi2_P_R1** Poor fit quality • **Fg_ctrl_contaminated_R1** Set if SSS_corr is significantly different from SSS_uncorr • **Fg_ctrl_sunglint_R1** Sunglint above threshold • **Fg_ctrl_moonglint_R1** Moonglint above threshold

	• **Fg_ctrl_gal_noise_R1** Galactic noise above threshold • **Fg_ctrl_mixed_scene_R1** Corrected by mixed scene AUX_MSOTT_ LUT before convergence • **Fg_ctrl_reach_maxiter_R1** Maximum number of iterations reached before convergence using forward model 1 • **Fg_ctrl_num_meas_min_R1** Not processed due to lack of valid measurements • **Fg_ctrl_num_meas_low_R1** Processed with a low number of measurements • **Fg_ctrl_many_outliers_R1** Number of outliers Dg_num_outliers >Tg_num_outliers_max • **Fg_ctrl_marq_R1** Iteration when Marquardt increment is greather than lambdaMax • **Fg_ctrl_roughness_R1** Roughness correction applied • **Fg_ctrl_foam_R1** Wind speed is less than Tg_WS_foam and foam contribution and foam fraction are set to zero • **Fg_ctrl_ecmwf_R1** Flag set to false if ECMWF data is missing for the different models • **Fg_ctrl_valid_R1** Discrimination tests • **Fg_ctrl_no_surface_R1** 42.5º angle not included in the dwell line • **Fg_ctrl_range_Acard_R1** Acard is outside range • **Fg_ctrl_sigma_Acard_R1** Acard sigma is too high • **Fg_ctrl_used_faraTEC_R1** TEC obtained from AUX_FARA_x • **Fg_ctrl_poor_geophysical_R1** Poor quality SSS due to geophysical problems • **Fg_ctrl_poor_retrieval_R1** Poor SSS quality due to retrieval failure, poor convergence • **Fg_ctrl_suspect_rfi_R1** Suspected of being contaminated by RFI • **Fg_ctrl_rfi_prone_X_R1** Contaminated by X polarization RFI as indicated by AUX_DGGRFI • **Fg_ctrl_rfi_prone_Y_R1** Contaminated by Y polarization RFI as indicated by AUX_DGGRFI • **Fg_ctrl_adjusted_ra_R1** Radiometric accuracy adjusted using AUX_DGGRFI • **Fg_ctrl_retriev_fail_R1** Iterative schema returned an error • **Param1_prior_R2** Prior descriptors & flags for 1st mapped retrieval configuration • **Param1_sigma_prior_R2** Sigma descriptors & flags for 1st mapped retrieval configuration • **Param2_prior_R2** Prior descriptors & flags for 1st mapped retrieval configuration • **Param2_sigma_prior_R2** Sigma descriptors & flags for 1st mapped retrieval configuration • **Param3_prior_R2** Prior descriptors & flags for 1st mapped retrieval configuration • **Param3_sigma_prior_R2** Sigma descriptors & flags for 1st mapped retrieval configuration • **Param4_prior_R2** Prior descriptors & flags for 1st mapped retrieval configuration • **Param4_sigma_prior_R2** Sigma descriptors & flags for 1st mapped retrieval configuration • **Param5_prior_R2** Prior descriptors & flags for 1st mapped retrieval configuration • **Param5_sigma_prior_R2** Sigma descriptors & flags for 1st mapped retrieval configuration • **Param6_prior_R2** Prior descriptors & flags for 1st mapped retrieval configuration • **Dg_LSC_R2** Dwell-line mean of absolute value of land-sea correction • **Fg_sc_land_sea_coast1_R2** Sea distance to coast • **Fg_sc_land_sea_coast2_R2** Sea distance to coast • **Fg_sc_TEC_gradient_R2** High TEC gradient along dwell for a grid point • **Fg_sc_in_clim_ice_R2** Maximum Sea Ice extension according to monthly climatology • **Fg_sc_ice_R2** Ice concentration above Tg_ice_concentration threshold • **Fg_sc_suspect_ice_R2** Suspected ice

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	• **Fg_ctrl_poor_geophysical_R2** Poor quality SSS due to geophysical problems • **Fg_ctrl_poor_retrieval_R2** Poor SSS quality due to retrieval failure, poor convergence • **Fg_ctrl_suspect_rfi_R2** Suspected of being contaminated by RFI • **Fg_ctrl_rfi_prone_X_R2** Contaminated by X polarization RFI as indicated by AUX_DGGRFI • **Fg_ctrl_rfi_prone_Y_R2** Contaminated by Y polarization RFI as indicated by AUX_DGGRFI • **Fg_ctrl_adjusted_ra_R2** Radiometric accuracy adjusted using AUX_DGGRFI • **Fg_ctrl_retriev_fail_R2** Iterative schema returned an error • **Param1_prior_R3** Prior descriptors & flags for 1st mapped retrieval configuration • **Param1_sigma_prior_R3** Sigma descriptors & flags for 1st mapped retrieval configuration • **Param2_prior_R3** Prior descriptors & flags for 1st mapped retrieval configuration • **Param2_sigma_prior_R3** Sigma descriptors & flags for 1st mapped retrieval configuration • **Param3_prior_R3** Prior descriptors & flags for 1st mapped retrieval configuration • **Param3_sigma_prior_R3** Sigma descriptors & flags for 1st mapped retrieval configuration • **Param4_prior_R3** Prior descriptors & flags for 1st mapped retrieval configuration • **Param4_sigma_prior_R3** Sigma descriptors & flags for 1st mapped retrieval configuration • **Param5_prior_R3** Prior descriptors & flags for 1st mapped retrieval configuration • **Param5_sigma_prior_R3** Sigma descriptors & flags for 1st mapped retrieval configuration • **Param6_prior_R3** Prior descriptors & flags for 1st mapped retrieval configuration • **Dg_LSC_R3** Dwell-line mean of absolute value of land-sea correction • **Fg_sc_land_sea_coast1_R3** Sea distance to coast • **Fg_sc_land_sea_coast2_R3** Sea distance to coast • **Fg_sc_TEC_gradient_R3** High TEC gradient along dwell for a grid point • **Fg_sc_in_clim_ice_R3** Maximum Sea Ice extension according to monthly climatology • **Fg_sc_ice_R3** Ice concentration above Tg_ice_concentration threshold • **Fg_sc_suspect_ice_R3** Suspected ice • **Fg_sc_rain_R3** Heavy rain suspected above Tg_max_rainfall threshold • **Fg_sc_high_wind_R3** Suspected High wind • **Fg_sc_low_wind_R3** Suspected Low wind • **Fg_sc_high_SST_R3** Suspected High SST • **Fg_sc_low_SST_R3** Suspected Low SST • **Fg_sc_high_SSS_R3** Suspected High SSS • **Fg_sc_low_SSS_R3** Suspected Low SSS • **Fg_sc_sea_state_1_R3** Sea state class 1 • **Fg_sc_sea_state_2_R3** Sea state class 2 • **Fg_sc_sea_state_3_R3** Sea state class 3 • **Fg_sc_sea_state_4_R3** Sea state class 4 • **Fg_sc_sea_state_5_R3** Sea state class 5 • **Fg_sc_sea_state_6_R3** Sea state class 6 • **Fg_sc_sst_front_R3** Suspected SST front • **Fg_sc_sss_front_R3** Suspected SST front • **Fg_sc_ice_Acard_R3** Ice flag from cardioid

	• **Fg_sc_ecmwf_land_R3** Suspected ECMWF land • **Fg_ctrl_ignore_R3** Not processed • **Fg_ctrl_range_R3** Retrieved values outside range using Forward model 1 • **Fg_ctrl_sigma_R3** High retrieval sigma using forward model 1 • **Fg_ctrl_chi2_R3** Poor fit quality • **Fg_ctrl_chi2_P_R3** Poor fit quality • **Fg_ctrl_contaminated_R3** Set if SSS_corr is significantly different from SSS_uncorr • **Fg_ctrl_sunglint_R3** Sunglint above threshold • **Fg_ctrl_moonglint_R3** Moonglint above threshold • **Fg_ctrl_gal_noise_R3** Galactic noise above threshold • **Fg_ctrl_mixed_scene_R3** Corrected by mixed scene AUX_MSOTT_ LUT before convergence • **Fg_ctrl_reach_maxiter_R3** Maximum number of iterations reached before convergence using forward model 1 • **Fg_ctrl_num_meas_min_R3** Not processed due to lack of valid measurements • **Fg_ctrl_num_meas_low_R3** Processed with a low number of measurements • **Fg_ctrl_many_outliers_R3** Number of outliers Dg_num_outliers >Tg_num_outliers_max • **Fg_ctrl_marq_R3** Iteration when Marquardt increment is greather than lambdaMax • **Fg_ctrl_roughness_R3** Roughness correction applied • **Fg_ctrl_foam_R3** Wind speed is less than Tg_WS_foam and foam contribution and foam fraction are set to zero • **Fg_ctrl_ecmwf_R3** Flag set to false if ECMWF data is missing for the different models • **Fg_ctrl_valid_R3** Discrimination tests • **Fg_ctrl_no_surface_R3** 42.5º angle not included in the dwell line • **Fg_ctrl_range_Acard_R3** Acard is outside range • **Fg_ctrl_sigma_Acard_R3** Acard sigma is too high • **Fg_ctrl_used_faraTEC_R3** TEC obtained from AUX_FARA_x • **Fg_ctrl_poor_geophysical_R3** Poor quality SSS due to geophysical problems • **Fg_ctrl_poor_retrieval_R3** Poor SSS quality due to retrieval failure, poor convergence • **Fg_ctrl_suspect_rfi_R3** Suspected of being contaminated by RFI • **Fg_ctrl_rfi_prone_X_R3** Contaminated by X polarization RFI as indicated by AUX_DGGRFI • **Fg_ctrl_rfi_prone_Y_R3** Contaminated by Y polarization RFI as indicated by AUX_DGGRFI • **Fg_ctrl_adjusted_ra_R3** Radiometric accuracy adjusted using AUX_DGGRFI • **Fg_ctrl_retriev_fail_R3** Iterative schema returned an error • **Param1_prior_R4** Prior descriptors & flags for 1st mapped retrieval configuration • **Param1_sigma_prior_R4** Sigma descriptors & flags for 1st mapped retrieval configuration • **Param2_prior_R4** Prior descriptors & flags for 1st mapped retrieval configuration • **Param2_sigma_prior_R4** Sigma descriptors & flags for 1st mapped retrieval configuration • **Param3_prior_R4** Prior descriptors & flags for 1st mapped retrieval configuration • **Param3_sigma_prior_R4** Sigma descriptors & flags for 1st mapped retrieval configuration • **Param4_prior_R4** Prior descriptors & flags for 1st mapped retrieval configuration • **Param4_sigma_prior_R4** Sigma descriptors & flags for 1st mapped retrieval configuration • **Param5_prior_R4** Prior descriptors & flags for 1st mapped retrieval configuration

	• **Param5_sigma_prior_R4** Sigma descriptors & flags for 1st mapped retrieval configuration • **Param6_prior_R4** Prior descriptors & flags for 1st mapped retrieval configuration • **Dg_LSC_R4** Dwell-line mean of absolute value of land-sea correction • **Fg_sc_land_sea_coast1_R4** Sea distance to coast • **Fg_sc_land_sea_coast2_R4** Sea distance to coast • **Fg_sc_TEC_gradient_R4** High TEC gradient along dwell for a grid point • **Fg_sc_in_clim_ice_R4** Maximum Sea Ice extension according to monthly climatology • **Fg_sc_ice_R4** Ice concentration above Tg_ice_concentration threshold • **Fg_sc_suspect_ice_R4** Suspected ice • **Fg_sc_rain_R4** Heavy rain suspected above Tg_max_rainfall threshold • **Fg_sc_high_wind_R4** Suspected High wind • **Fg_sc_low_wind_R4** Suspected Low wind • **Fg_sc_high_SST_R4** Suspected High SST • **Fg_sc_low_SST_R4** Suspected Low SST • **Fg_sc_high_SSS_R4** Suspected High SSS • **Fg_sc_low_SSS_R4** Suspected Low SSS • **Fg_sc_sea_state_1_R4** Sea state class 1 • **Fg_sc_sea_state_2_R4** Sea state class 2 • **Fg_sc_sea_state_3_R4** Sea state class 3 • **Fg_sc_sea_state_4_R4** Sea state class 4 • **Fg_sc_sea_state_5_R4** Sea state class 5 • **Fg_sc_sea_state_6_R4** Sea state class 6 • **Fg_sc_sst_front_R4** Suspected SST front • **Fg_sc_sss_front_R4** Suspected SST front • **Fg_sc_ice_Acard_R4** Ice flag from cardioid • **Fg_sc_ecmwf_land_R4** Suspected ECMWF land • **Fg_ctrl_ignore_R4** Not processed • **Fg_ctrl_range_R4** Retrieved values outside range using Forward model 1 • **Fg_ctrl_sigma_R4** High retrieval sigma using forward model 1 • **Fg_ctrl_chi2_R4** Poor fit quality • **Fg_ctrl_chi2_P_R4** Poor fit quality • **Fg_ctrl_contaminated_R4** Set if SSS_corr is significantly different from SSS_uncorr • **Fg_ctrl_sunglint_R4** Sunglint above threshold • **Fg_ctrl_moonglint_R4** Moonglint above threshold • **Fg_ctrl_gal_noise_R4** Galactic noise above threshold • **Fg_ctrl_mixed_scene_R4** Corrected by mixed scene AUX_MSOTT_ LUT before convergence • **Fg_ctrl_reach_maxiter_R4** Maximum number of iterations reached before convergence using forward model 1 • **Fg_ctrl_num_meas_min_R4** Not processed due to lack of valid measurements • **Fg_ctrl_num_meas_low_R4** Processed with a low number of measurements • **Fg_ctrl_many_outliers_R4** Number of outliers Dg_num_outliers >Tg_num_outliers_max • **Fg_ctrl_marq_R4** Iteration when Marquardt increment is greather than lambdaMax

	• **Fg_ctrl_roughness_R4** Roughness correction applied • **Fg_ctrl_foam_R4** Wind speed is less than Tg_WS_foam and foam contribution and foam fraction are set to zero • **Fg_ctrl_ecmwf_R4** Flag set to false if ECMWF data is missing for the different models • **Fg_ctrl_valid_R4** Discrimination tests • **Fg_ctrl_no_surface_R4** 42.5º angle not included in the dwell line • **Fg_ctrl_range_Acard_R4** Acard is outside range • **Fg_ctrl_sigma_Acard_R4** Acard sigma is too high • **Fg_ctrl_used_faraTEC_R4** TEC obtained from AUX_FARA_x • **Fg_ctrl_poor_geophysical_R4** Poor quality SSS due to geophysical problems • **Fg_ctrl_poor_retrieval_R4** Poor SSS quality due to retrieval failure, poor convergence • **Fg_ctrl_suspect_rfi_R4** Suspected of being contaminated by RFI • **Fg_ctrl_rfi_prone_X_R4** Contaminated by X polarization RFI as indicated by AUX_DGGRFI • **Fg_ctrl_rfi_prone_Y_R4** Contaminated by Y polarization RFI as indicated by AUX_DGGRFI • **Fg_ctrl_adjusted_ra_R4** Radiometric accuracy adjusted using AUX_DGGRFI • **Fg_ctrl_retriev_fail_R4** Iterative schema returned an error • **Param1_R1** Value, theoretical uncertainty & counters for 1st mapped configuration • **Param1_sigma_R1** Value, theoretical uncertainty & counters for 1st mapped configuration • **Param2_R1** Value, theoretical uncertainty & counters for 1st mapped configuration • **Param2_sigma_R1** Value, theoretical uncertainty & counters for 1st mapped configuration • **Param3_R1** Value, theoretical uncertainty & counters for 1st mapped configuration • **Param3_sigma_R1** Value, theoretical uncertainty & counters for 1st mapped configuration • **Param4_R1** Value, theoretical uncertainty & counters for 1st mapped configuration • **Param4_sigma_R1** Value, theoretical uncertainty & counters for 1st mapped configuration • **Param5_R1** Value, theoretical uncertainty & counters for 1st mapped configuration • **Param5_sigma_R1** Value, theoretical uncertainty & counters for 1st mapped configuration • **Dg_num_iter_R1** Number of iterations for 1st mapped configuration • **Dg_quality_R1** Quality index for 1st mapped configuration • **Dg_chi2_R1** Normalized retrieval fit quality index for 1st mapped configuration • **Dg_chi2_P_R1** Normalised chi2 for 1st mapped configuration • **Param1_R2** Value, theoretical uncertainty & counters for 1st mapped configuration • **Param1_sigma_R2** Value, theoretical uncertainty & counters for 1st mapped configuration • **Param2_R2** Value, theoretical uncertainty & counters for 1st mapped configuration • **Param2_sigma_R2** Value, theoretical uncertainty & counters for 1st mapped configuration • **Param3_R2** Value, theoretical uncertainty & counters for 1st mapped configuration • **Param3_sigma_R2** Value, theoretical uncertainty & counters for 1st mapped configuration • **Param4_R2** Value, theoretical uncertainty & counters for 1st mapped configuration • **Param4_sigma_R2** Value, theoretical uncertainty & counters for 1st mapped configuration • **Param5_R2** Value, theoretical uncertainty & counters for 1st mapped configuration • **Param5_sigma_R2** Value, theoretical uncertainty & counters for 1st mapped configuration • **Dg_num_iter_R2** Number of iterations for 1st mapped configuration • **Dg_quality_R2** Quality index for 1st mapped configuration

	• **Dg_chi2_R2** Normalized retrieval fit quality index for 1st mapped configuration • **Dg_chi2_P_R2** Normalised chi2 for 1st mapped configuration • **Param1_R3** Value, theoretical uncertainty & counters for 1st mapped configuration • **Param1_sigma_R3** Value, theoretical uncertainty & counters for 1st mapped configuration • **Param2_R3** Value, theoretical uncertainty & counters for 1st mapped configuration • **Param2_sigma_R3** Value, theoretical uncertainty & counters for 1st mapped configuration • **Param3_R3** Value, theoretical uncertainty & counters for 1st mapped configuration • **Param3_sigma_R3** Value, theoretical uncertainty & counters for 1st mapped configuration • **Param4_R3** Value, theoretical uncertainty & counters for 1st mapped configuration • **Param4_sigma_R3** Value, theoretical uncertainty & counters for 1st mapped configuration • **Param5_R3** Value, theoretical uncertainty & counters for 1st mapped configuration • **Param5_sigma_R3** Value, theoretical uncertainty & counters for 1st mapped configuration • **Dg_num_iter_R3** Number of iterations for 1st mapped configuration • **Dg_quality_R3** Quality index for 1st mapped configuration • **Dg_chi2_R3** Normalized retrieval fit quality index for 1st mapped configuration • **Dg_chi2_P_R3** Normalised chi2 for 1st mapped configuration • **Param1_R4** Value, theoretical uncertainty & counters for 1st mapped configuration • **Param1_sigma_R4** Value, theoretical uncertainty & counters for 1st mapped configuration • **Param2_R4** Value, theoretical uncertainty & counters for 1st mapped configuration • **Param2_sigma_R4** Value, theoretical uncertainty & counters for 1st mapped configuration • **Param3_R4** Value, theoretical uncertainty & counters for 1st mapped configuration • **Param3_sigma_R4** Value, theoretical uncertainty & counters for 1st mapped configuration • **Param4_R4** Value, theoretical uncertainty & counters for 1st mapped configuration • **Param4_sigma_R4** Value, theoretical uncertainty & counters for 1st mapped configuration • **Param5_R4** Value, theoretical uncertainty & counters for 1st mapped configuration • **Param5_sigma_R4** Value, theoretical uncertainty & counters for 1st mapped configuration • **Dg_num_iter_R4** Number of iterations for 1st mapped configuration • **Dg_quality_R4** Quality index for 1st mapped configuration • **Dg_chi2_R4** Normalized retrieval fit quality index for 1st mapped configuration • **Dg_chi2_P_R4** Normalised chi2 for 1st mapped configuration • **Snapshot_ID** Snapshot ID • **Fm_scene_contamination** Suspected of being contaminated by RFI • **Fm_ott** Ocean Target Transformation has been applied • **Fm_mixed_scene** Mixed scene (land-sea) correction applied • **Fm_l1c_rfi** Contaminated by RFI in L1c • **Fm_l1c_software_error** L1c Software_Error_flag is set or L1c BT value is invalid • **Fm_l1c_instrument_error** L1c Instrument_Error_flag • **Fm_l1c_adf_error** L1c ADF_Error_flag • **Fm_l1c_calibration_error** L1c Calibration_Error_flag • **Fm_l2_rfi** Suspected of being contaminated by RFI • **Fm_l2_rfi_outlier** Suspected of being contaminated by RFI by discrimination outlier tests • **Fm_l2_rfi_snapshot_out_of_range** Suspected of being contaminated by RFI due to out-of-

	range BTs in snapshot • **Fm_l2_rfi_high_snapshot_std** Suspected of being contaminated by RFI because snapshot std/ra for XX/YY measurements is too high • **Fm_l2_rfi_high_snapshot_std_sto** Suspected of being contaminated by RFI because snapshot std/ra for Stokes3 measurements is too high • **Fm_l2_rfi_high_snapshot_std_sto** Suspected of being contaminated by RFI because snapshot std/ra for Stokes4 measurements is too high • **Fm_LO_calibration** Snapshot immediately following a LO calibration • **Diff_TB** Difference between L1c measurementband forward model 1 BTs
Description	Parameter whose data is to be plotted. Further details on their actual meaning, units and interpretation can be found in the respective product specifications ([AD. 1], [AD. 2]).

X-Path	/GMT_Configuration/Map/Product/Overlap
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	Average
Format	The valid values are: • **Average** Average all the values at that bin • **Deviation** Standard deviation at that bin • **Maximum** Maximum value at that bin • **Minimum** Minimum value at that bin • **Oldest** Oldest value at that bin by sensing time • **Latest** Latest value at that bin by sensing time
Description	Resolution policy that shall be used when more than a single value falls within a given bin of the applicable grid.

X-Path	/GMT_Configuration/Map/Product/Filters/Orbit
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	All
Format	The valid values are: • **All** All orbit orientations • **Ascending** Ascending orbit orientation only • **Descending** Descending orbit orientation only
Description	Orbit orientation the products must have in order to be plotted. If a product with an orbit orientation different from the one here specified is encountered, it will be silently ignored.

X-Path	/GMT_Configuration/Map/Product/Filters/Fill_Value
Type	Real
Occurrences	0 or 1 **Optional**

Units	Those of the selected parameter
Default value	*None*
Format	Any rational number in decimal form.
Description	In some L2 parameters, a special value (e.g. -999.0) is used to indicate the absence of a valid value. This configuration item is used to specify such a value and, as a consequence, any matching values which are encountered among the input data will be silently ignored.

5.19 SMOS L2 OCEAN SALINITY USER DATA PRODUCTS

5.19.1 GENERAL INFORMATION

The SMOS L2 SSS processor generates two types of product:

- The Level 2 Ocean Salinity User Data Product (MIR_OSUDP2) is designed for oceanographers and high level processing centers. It includes geophysical parameters, a theorical estimate of their accuracy and flags and descriptors for the product quality.
- The Level 2 Ocean Salinity Data Analysis Product: more information, for quality control and advanced users, are available in the Data Analysis Report (MIR_OSDAP2).

The SMOS L2 SSS processor derives one geophysical parameter, the Sea Surface Salinity. The iterative retrieval method that is implemented in the processor is able to derive some information on other geophysical parameters depending on the forward model used in the iterative scheme. The forward model accounts for main contributions to the measurements. For one of these contributions, the one due to the roughness of sea surface, three sub-models are implemented in parallel in the processor. For this reason, most geophysical parameters in the output products are repeated three times.

5.19.2 TYPE AND SIZE

The following SMOS file types are addressed when referring to L2 Ocean Salinity User Data products, with their typical size indicated next to each entry:

- MIR_OSUDP2 9,76 MB

5.19.3 FILENAME

The naming convention for SMOS L2 products is described in detail in [AD. 2].

5.19.4 STRUCTURE

The structure of the SMOS L2 products is elaborated in [AD. 2]. Please refer to this document as the main source for information regarding these files.

5.19.5 GMT CONFIGURATION

In addition to the general parameters which can be defined within a map entry, as part of a GMT configuration file, the following filters are applicable when plotting L2 Ocean Salinity User Data products:

- Orbit Orbit orientation
- Fill_Value Value used to indicate the absence of valid data

In particular, the details on these, along with the appropriate values for the product type, the parameter to be plotted, and the overlap resolution policy, are provided below:

X-Path	/GMT_Configuration/Map/Product/Type
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A

Format	The valid values for this type of product (MIR_OSUDP2) are: • **MIR_OSUDP2** L2 Ocean Salinity User Data Products
Description	Type of the SMOS products to be plotted. If products of any other type are present in the input directory, they will be silently ignored by the GMT.

X-Path	/GMT_Configuration/Map/Product/Parameter
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (MIR_OSUDP2) are[15]: • **Grid_Point_ID** Unique identifier for the grid point • **Latitude** Latitude of the DGG cell's center • **Longitude** Longitude of the DGG cell's center • **Equiv_ftprt_Diam** Equivalent footprint diameter • **Mean_acq_time** Mean time of acquisition for all valid TB • **SSS_corr** Sea surface salinity corrected for land-sea contamination • **Sigma_SSS_corr** Theoretical uncertainty computed for SSS_corr • **SSS_uncorr** Sea surface salinity without land-sea contamination correction • **Sigma_SSS_uncorr** Theoretical uncertainty computed for SSS_uncorr • **SSS_anom** Sea surface salinity anomaly • **Sigma_SSS_anom** Theoretical uncertainty computed for SSS_anom • **A_card** Effective Acard retrieved with minimalist model • **Sigma_Acard** Theoretical uncertainty computed for Acard • **WS** Equivalent neutral wind speed from ECMWF • **Sigma_WS**[16] Theoretical uncertainty associated with WS • **SST** Sea surface temperature from ECMWF • **Sigma_SST**Error! Bookmark not defined. Theoretical uncertainty associated with SST • **Tb_42.5H** Brightness temp. at surface level (H pol.) • **Sigma_Tb_42.5H** Theoretical uncertainty of Tb_42.5H • **Tb_42.5V** Brightness temp. at surface level (V pol.) • **Sigma_Tb_42.5V** Theoretical uncertainty of Tb_42.5V • **Tb_42.5X** Brightness temp. at antenna level (X pol.) • **Sigma_Tb_42.5X** Theoretical uncertainty of Tb_42.5X • **Tb_42.5Y** Brightness temp. at antenna level (Y pol.) • **Sigma_Tb_42.5Y** Theoretical uncertainty of Tb_42.5Y

[15] Please check Annex B to see the valid values for the MIR_OSUDP2 products prior to the V660 format change

[16] Parameter is only possible to be displayed for products generated with schema version 300.

	• **Dg_chi2_corr** Retrieval fit quality index for SSS_corr • **Dg_chi2_uncorr** Retrieval fit quality index for SSS_uncorr • **WS_corr** Wind speed module retrieved with SSS_corr • **Dg_chi2_Acard** Retrieval fit quality index (cardioid model) • **Dg_chi2_P_corr** Chi2 high value acceptability probability for SSS_corr • **Dg_chi2_P_uncorr** Chi2 high value acceptability probability for SSS_uncorr • **Sigma_WS_corr** Error on wind speed module retrieved with SSS_corr • **Dg_chi2_P_Acard** Chi2 high value acceptability probability from cardioid model • **Dg_quality_SSS_corr** Quality index for SSS_corr • **Dg_quality_SSS_uncorr** Quality index for SSS_uncorr • **Dg_quality_SSS_anom** Quality index for SSS_anom • **SSS_climatology** Salinity from interpolated climatology • **Dg_num_iter_corr** Number of iterations for the retrieval of SSS_corr • **Dg_num_iter_uncorr** Number of iterations for the retrieval of SSS_uncorr • **Coast_distance** Distance to nearest coast • **Dg_num_iter_Acard** Number of iterations (cardioid model) • **Dg_num_meas_l1C** Number of measurements in L1C product • **Dg_num_meas_valid** Number of valid measurements for SSS retr. • **Dg_border_fov** Valid measurements with BORDER_FOV • **Dg_af_fov** Valid measurements with AF_FOV • **Dg_sun_tails** Number of measurements with SUN_TAILS • **Dg_sun_glint_area** Number of measurements with SUN_GLINT… • **Dg_sun_glint_fov** Number of measurements with SUN_GLINT… • **Dg_sun_fov** Number of measurements with SUN_FOV • **Dg_sun_glint_L2** Number of measurements with L2 sunglint • **Dg_Suspect_ice** Number of suspected ice contaminated m… • **Dg_galactic_Noise_Error** Number of discarded measurements • **Dg_moonglint** Number of measurements with L2 moonglint • **Dg_sky** Measurements towards a strong source • **ST1_S** First stokes param at surface level • **PI_S** Polarization index at surface level • **ST1_ToA** First stokes parameter at top of atmosphere • **PI_ToA** Polarization index at top of atmosphere • **Dg_RFI_L1** Number of measurements suspected by L1 as being contaminated by RFI • **Dg_RFI_X** Number of measurements suspected of being contaminated by RFI in X polarization • **Dg_RFI_Y** Number of measurements suspected of being contaminated by RFI in Y polarization

	• **Dg_RFI_probability**	Probability of grid point beingcontaminated by RFI
	• **Fg_ctrl_ignore_corr**[17]	Set if grid point is not processed
	• **Fg_ctrl_ignore_uncorr**	Set if grid point is not processed
	• **Fg_ctrl_ignore_anom**	Set if grid point is not processed
	• **Fg_ctrl_ignore_Acard**	Set if grid point is not processed
	• **Fg_ctrl_range_corr**[18]	Values outside range using forward model with land-sea contamination correction
	• **Fg_ctrl_range_uncorr**	Values outside range using forward model without land-sea contamination correction
	• **Fg_ctrl_range_anom**	Values outside range using forward model with some anomaly
	• **Fg_ctrl_range_Acard**	Values outside range using cardioid model
	• **Fg_ctrl_sigma_corr** contamination corrected	High retrieval sigma using forward model with land-sea
	• **Fg_ctrl_sigma_uncorr**	High retrieval sigma using forward model without land-sea contamination corrected
	• **Fg_ctrl_sigma_anom**	High retrieval sigma using forward model with anomaly
	• **Fg_ctrl_sigma_Acard**	High retrieval sigma using cardioid model
	• **Fg_ctrl_chi2_corr** contamination corrected	Poor fit quality using forward model with land-sea
	• **Fg_ctrl_chi2_uncorr**	Poor fit quality using forward model without land-sea contamination corrected
	• **Fg_ctrl_chi2_anom**	Poor fit quality using forward model with anomaly
	• **Fg_ctrl_chi2_Acard**	Poor fit quality using cardioid model
	• **Fg_ctrl_chi2_P_corr**	Poor fit quality using forward model 1
	• **Fg_ctrl_chi2_P_uncorr**	Poor fit quality using forward model 2
	• **Fg_ctrl_chi2_P_anom**	Poor fit quality using forward model 3
	• **Fg_ctrl_chi2_P_Acard**	Poor fit quality using cardioid model
	• **Fg_ctrl_contaminated_corr** SSS_uncorr	Set if SSS_corr is significantly different from
	• **Fg_ctrl_contaminated_uncorr** SSS_uncorr	Set if SSS_corr is significantly different from
	• **Fg_ctrl_contaminated_anom** SSS_uncorr	Set if SSS_corr is significantly different from
	• **Fg_ctrl_contaminated_Acard** SSS_uncorr	Set if SSS_corr is significantly different from
	• **Fg_ctrl_sunglint_corr**	High number of values flagged for sunglint
	• **Fg_ctrl_sunglint_uncorr**	High number of values flagged for sunglint

[17] OSUDP2 products contain four blocks of control and science flags, one for each model defined. Given that the names of the flags within each of these is similar, a subscript is appended to each identifier to differentiate the particular model the flag refers to: _corr (forward model with land-sea contamination correction corr), _uncorr (forward model without land-sea contamination correction), _anom (forward model with anomaly), _Acard (cardioid model)

[18] OSUDP2 products contain four blocks of control and science flags, one for each model defined. Given that the names of the flags within each of these is similar, a subscript is appended to each identifier to differentiate the particular model the flag refers to: _corr (forward model with land-sea contamination correction corr), _uncorr (forward model without land-sea contamination correction), _anom (forward model with anomaly), _Acard (cardioid model)

	• **Fg_ctrl_sunglint_anom** High number of values flagged for sunglint • **Fg_ctrl_sunglint_Acard** High number of values flagged for sunglint • **Fg_ctrl_moonglint_corr** High number of values flagged for moonglint • **Fg_ctrl_moonglint_uncorr** High number of values flagged for moonglint • **Fg_ctrl_moonglint_anom** High number of values flagged for moonglint • **Fg_ctrl_moonglint_Acard** High number of values flagged for moonglint • **Fg_ctrl_gal_noise_corr** High number of values flagged for gal. noise • **Fg_ctrl_gal_noise_uncorr** High number of values flagged for gal. noise • **Fg_ctrl_gal_noise_anom** High number of values flagged for gal. noise • **Fg_ctrl_gal_noise_Acard** High number of values flagged for gal. Noise • **Fg_ctrl_mixed_scene_corr** Grid point measurements have been corrected by mixed scene (land-sea) • **Fg_ctrl_mixed_scene_uncorr** Grid point measurements have been corrected by mixed scene (land-sea) • **Fg_ctrl_mixed_scene_anom** Grid point measurements have been corrected by mixed scene (land-sea) • **Fg_ctrl_mixed_scene_Acard** Grid point measurements have been corrected by mixed scene (land-sea) • **Fg_ctrl_reach_maxiter_corr** Maximum number of iterations reached • **Fg_ctrl_reach_maxiter_uncorr** Maximum number of iterations reached • **Fg_ctrl_reach_maxiter_anom** Maximum number of iterations reached • **Fg_ctrl_reach_maxiter_Acard** Maximum number of iterations reached • **Fg_ctrl_num_meas_min_corr** Not processed due to too few valid meas. • **Fg_ctrl_num_meas_min_uncorr** Not processed due to too few valid meas. • **Fg_ctrl_num_meas_min_anom** Not processed due to too few valid meas. • **Fg_ctrl_num_meas_min_Acard** Not processed due to too few valid meas. • **Fg_ctrl_num_meas_low_corr** Number of valid measurements is low • **Fg_ctrl_num_meas_low_uncorr** Number of valid measurements is low • **Fg_ctrl_num_meas_low_anom** Number of valid measurements is low • **Fg_ctrl_num_meas_low_Acard** Number of valid measurements is low • **Fg_ctrl_many_outliers_corr** Number of outliers too high • **Fg_ctrl_many_outliers_uncorr** Number of outliers too high • **Fg_ctrl_many_outliers_anom** Number of outliers too high • **Fg_ctrl_many_outliers_Acard** Number of outliers too high • **Fg_ctrl_marq_corr** Marquardt increment is greater than lambda • **Fg_ctrl_marq_uncorr** Marquardt increment is greater than lambda • **Fg_ctrl_marq_anom** Marquardt increment is greater than lambda • **Fg_ctrl_marq_Acard** Marquardt increment is greater than lambda • **Fg_ctrl_roughness_corr** Roughness correction applied • **Fg_ctrl_roughness_uncorr** Roughness correction applied • **Fg_ctrl_roughness_anom** Roughness correction applied • **Fg_ctrl_roughness_Acard** Roughness correction applied • **Fg_ctrl_foam_corr** Low wind speed and zero foam contribution

	• **Fg_ctrl_foam_uncorr** Low wind speed and zero foam contribution • **Fg_ctrl_foam_anom** Low wind speed and zero foam contribution • **Fg_ctrl_foam_Acard** Low wind speed and zero foam contribution • **Fg_ctrl_ecmwf_corr** One or more ECMWF data is missing • **Fg_ctrl_ecmwf_uncorr** One or more ECMWF data is missing • **Fg_ctrl_ecmwf_anom** One or more ECMWF data is missing • **Fg_ctrl_ecmwf_Acard4** One or more ECMWF data is missing • **Fg_ctrl_valid_corr** Grid points pass measurement discrimination tests • **Fg_ctrl_valid_uncorr** Grid points pass measurement discrimination tests • **Fg_ctrl_valid_anom** Grid points pass measurement discrimination tests • **Fg_ctrl_valid_Acard** Grid points pass measurement discrimination tests • **Fg_ctrl_no_surface_corr** The 42.5º angle is not included in the dwell line • **Fg_ctrl_no_surface_uncorr** The 42.5º angle is not included in the dwell line • **Fg_ctrl_no_surface_anom** The 42.5º angle is not included in the dwell line • **Fg_ctrl_no_surface_Acard** The 42.5º angle is not included in the dwell line • **Fg_ctrl_range_Acard_corr** Retrieved Acard is outside range • **Fg_ctrl_range_Acard_uncor** Retrieved Acard is outside range • **Fg_ctrl_range_Acard_anom** Retrieved Acard is outside range • **Fg_ctrl_range_Acard_Acard** Retrieved Acard is outside range • **Fg_ctrl_sigma_Acard_corr** Retrieved Acard sigma is too high • **Fg_ctrl_sigma_Acard_uncorr** Retrieved Acard sigma is too high • **Fg_ctrl_sigma_Acard_anom** Retrieved Acard sigma is too high • **Fg_ctrl_sigma_Acard_Acard** Retrieved Acard sigma is too high • **Fg_ctrl_used_faraTEC_corr** TEC for this grid point was obtained from AUX_FARA_x • **Fg_ctrl_used_faraTEC_uncorr** TEC for this grid point was obtained from AUX_FARA_x • **Fg_ctrl_used_faraTEC_anom** TEC for this grid point was obtained from AUX_FARA_x • **Fg_ctrl_used_faraTEC_Acard** TEC for this grid point was obtained from AUX_FARA_x • **Fg_ctrl_poor_geophysical_corr** Flag set if the grid point probably has poor quality SSS_corr due to geophysical problems or Fg_ctrl_valid_corr==false • **Fg_ctrl_poor_geophysical_**uncorr Flag set if the grid point probably has poor quality SSS_uncorr due to geophysical problems or Fg_ctrl_valid_uncorr==false • **Fg_ctrl_poor_geophysical_**anom Flag set if the grid point probably has poor quality SSS_anom due to geophysical problems or Fg_ctrl_valid_anom==false

	• **Fg_ctrl_poor_geophysical**_Acard — Flag set if the grid point probably has poor quality SSS_Acard due to geophysical problems or Fg_ctrl_valid_Acard==false • **Fg_ctrl_poor_retrieval_corr** — Flag set if the grid point has poor SSS_corr due to retrieval failure, poor quality convergence or Fg_ctrl_valid_corr==false • **Fg_ctrl_poor_retrieval_uncorr** — Flag set if the grid point has poor SSS_uncorr due to retrieval failure, poor quality convergence or Fg_ctrl_valid_uncorr==false • **Fg_ctrl_poor_retrieval_anom** — Flag set if the grid point has poor SSS_anom due to retrieval failure, poor quality convergence or Fg_ctrl_valid_anom==false • **Fg_ctrl_poor_retrieval_Acard** — Flag set if the grid point has poor SSS4 due to retrieval failure, poor quality convergence or Fg_ctrl_valid_Acard==false • **Fg_ctrl_suspect_rfi_corr** — Grid point is suspected of being contaminated by RFI • **Fg_ctrl_suspect_rfi_uncorr** — Grid point is suspected of being contaminated by RFI • **Fg_ctrl_suspect_rfi_anom** — Grid point is suspected of being contaminated by RFI • **Fg_ctrl_suspect_rfi_Acard** — Grid point is suspected of being contaminated by RFI • **Fg_ctrl_rfi_prone_X_corr** — Contaminated by X polarisation RFI • **Fg_ctrl_rfi_prone_X_uncorr** — Contaminated by X polarisation RFI • **Fg_ctrl_rfi_prone_X_anom** — Contaminated by X polarisation RFI • **Fg_ctrl_rfi_prone_X_Acard** — Contaminated by X polarisation RFI • **Fg_ctrl_rfi_prone_Y_corr** — Contaminated by Y polarisation RFI • **Fg_ctrl_rfi_prone_Y_uncorr** — Contaminated by Y polarisation RFI • **Fg_ctrl_rfi_prone_Y_anom** — Contaminated by Y polarisation RFI • **Fg_ctrl_rfi_prone_Y_Acard** — Contaminated by Y polarisation RFI • **Fg_ctrl_adjusted_ra_corr** — Set if radiometric accuracy of measurements on this grid point have been adjusted • **Fg_ctrl_adjusted_ra_uncorr** — Set if radiometric accuracy of measurements on this grid point have been adjusted • **Fg_ctrl_adjusted_ra_anom** — Set if radiometric accuracy of measurements on this grid point have been adjusted • **Fg_ctrl_adjusted_ra_Acard** — Set if radiometric accuracy of measurements on this grid point have been adjusted • **Fg_ctrl_retriev_fail_corr** — Flag raised if iterative scheme returns an error • **Fg_ctrl_retriev_fail_uncorr** — Flag raised if iterative scheme returns an error • **Fg_ctrl_retriev_fail_anom** — Flag raised if iterative scheme returns an error • **Fg_ctrl_retriev_fail_Acard** — Flag raised if iterative scheme returns an error • **Fg_sc_land_sea_coast1_corr** — Land flag (filtered grid points) • **Fg_sc_land_sea_coast1_uncorr** — Land flag (filtered grid points) • **Fg_sc_land_sea_coast1_anom** — Land flag (filtered grid points) • **Fg_sc_land_sea_coast1_Acard** — Land flag (filtered grid points) • **Fg_sc_land_sea_coast2_corr** — Land flag (filtered grid points)

	• **Fg_sc_land_sea_coast2_uncorr** Land flag (filtered grid points) • **Fg_sc_land_sea_coast2_anom** Land flag (filtered grid points) • **Fg_sc_land_sea_coast2_Acard** Land flag (filtered grid points) • **Fg_sc_TEC_gradient_corr** High TEC gradient along dwell for a grid point • **Fg_sc_TEC_gradient_uncorr** High TEC gradient along dwell for a grid point • **Fg_sc_TEC_gradient_anom** High TEC gradient along dwell for a grid point • **Fg_sc_TEC_gradient_Acard** High TEC gradient along dwell for a grid point • **Fg_sc_in_clim_ice_corr** Grid point with maximum extent of sea ice • **Fg_sc_in_clim_ice_uncorr** Grid point with maximum extent of sea ice • **Fg_sc_in_clim_ice_anom** Grid point with maximum extent of sea ice • **Fg_sc_in_clim_ice_Acard** Grid point with maximum extent of sea ice • **Fg_sc_ice_corr** ECMWF gives high ice concentration • **Fg_sc_ice_uncorr** ECMWF gives high ice concentration • **Fg_sc_ice_anom** ECMWF gives high ice concentration • **Fg_sc_ice_Acard** ECMWF gives high ice concentration • **Fg_sc_suspect_ice_corr** High ice concentration suspected • **Fg_sc_suspect_ice_uncorr** High ice concentration suspected • **Fg_sc_suspect_ice_anom** High ice concentration suspected • **Fg_sc_suspect_ice_Acard** High ice concentration suspected • **Fg_sc_rain_corr** Rain rate is above the threshold • **Fg_sc_rain_uncorr** Rain rate is above the threshold • **Fg_sc_rain_anom** Rain rate is above the threshold • **Fg_sc_rain_Acard** Rain rate is above the threshold • **Fg_sc_high_wind_corr** High or low wind condition • **Fg_sc_high_wind_uncorr** High or low wind condition • **Fg_sc_high_wind_anom** High or low wind condition • **Fg_sc_high_wind_Acard** High or low wind condition • **Fg_sc_low_wind_corr** Low wind condition • **Fg_sc_low_wind_uncorr** Low wind condition • **Fg_sc_low_wind_anom** Low wind condition • **Fg_sc_low_wind_Acard** Low wind condition • **Fg_sc_high_SST_corr** High or low SST condition • **Fg_sc_high_SST_uncorr** High or low SST condition • **Fg_sc_high_SST_anom** High or low SST condition • **Fg_sc_high_SST_Acard** High or low SST condition • **Fg_sc_low_SST_corr** Low SST condition • **Fg_sc_low_SST_uncorr** Low SST condition • **Fg_sc_low_SST_anom** Low SST condition • **Fg_sc_low_SST_Acard** Low SST condition • **Fg_sc_high_SSS_corr** High or low SSS condition • **Fg_sc_high_SSS_uncorr** High or low SSS condition

	• **Fg_sc_high_SSS_anom** High or low SSS condition • **Fg_sc_high_SSS_Acard** High or low SSS condition • **Fg_sc_low_SSS_corr** Low SSS condition • **Fg_sc_low_SSS_uncorr** Low SSS condition • **Fg_sc_low_SSS_anom** Low SSS condition • **Fg_sc_low_SSS_Acard** Low SSS condition • **Fg_sc_sea_state_1_corr** Sea state class 1 • **Fg_sc_sea_state_1_uncorr** Sea state class 1 • **Fg_sc_sea_state_1_anom** Sea state class 1 • **Fg_sc_sea_state_1_Acard** Sea state class 1 • **Fg_sc_sea_state_2_corr** Sea state class 2 • **Fg_sc_sea_state_2_uncorr** Sea state class 2 • **Fg_sc_sea_state_2_anom** Sea state class 2 • **Fg_sc_sea_state_2_Acard** Sea state class 2 • **Fg_sc_sea_state_3_corr** Sea state class 3 • **Fg_sc_sea_state_3_uncorr** Sea state class 3 • **Fg_sc_sea_state_3_anom** Sea state class 3 • **Fg_sc_sea_state_3_Acard** Sea state class 3 • **Fg_sc_sea_state_4_corr** Sea state class 4 • **Fg_sc_sea_state_4_uncorr** Sea state class 4 • **Fg_sc_sea_state_4_anom** Sea state class 4 • **Fg_sc_sea_state_4_Acard** Sea state class 4 • **Fg_sc_sea_state_5_corr** Sea state class 5 • **Fg_sc_sea_state_5_uncorr** Sea state class 5 • **Fg_sc_sea_state_5_anom** Sea state class 5 • **Fg_sc_sea_state_5_Acard** Sea state class 5 • **Fg_sc_sea_state_6_corr** Sea state class 6 • **Fg_sc_sea_state_6_uncorr** Sea state class 6 • **Fg_sc_sea_state_6_anom** Sea state class 6 • **Fg_sc_sea_state_6_Acard** Sea state class 6 • **Fg_sc_sst_front_corr** Presence of a temperature front • **Fg_sc_sst_front_uncorr** Presence of a temperature front • **Fg_sc_sst_front_anom** Presence of a temperature front • **Fg_sc_sst_front_Acard** Presence of a temperature front • **Fg_sc_sss_front_corr** Presence of a salinity front • **Fg_sc_sss_front_uncorr** Presence of a salinity front • **Fg_sc_sss_front_anom** Presence of a salinity front • **Fg_sc_sss_front_anom** Presence of a salinity front • **Fg_sc_ice_Acard_corr** Ice flag from cardioid • **Fg_sc_ice_Acard_uncorr** Ice flag from cardioid • **Fg_sc_ice_Acard_anom** Ice flag from cardioid

	• **Fg_sc_ice_Acard_Acard** — Ice flag from cardioids • **Fg_sc_ecmwf_land_corr** — Grid point contains some land. Flag set if ECMWF Land_Sea_Mask > 0 • **Fg_sc_ecmwf_land _uncorr** — Grid point contains some land. Flag set if ECMWF Land_Sea_Mask > 0 • **Fg_sc_ecmwf_land _anom** — Grid point contains some land. Flag set if ECMWF Land_Sea_Mask > 0 • **Fg_sc_ecmwf_land _Acard** — Grid point contains some land. Flag set if ECMWF Land_Sea_Mask > 0
Description	Parameter whose data is to be plotted. Further details on their actual meaning, units and interpretation can be found in the respective product specifications ([AD. 1], [AD. 2]).

X-Path	/GMT_Configuration/Map/Product/Overlap
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	Average
Format	The valid values are: • **Average** — Average all the values at that bin • **Deviation** — Standard deviation at that bin • **Maximum** — Maximum value at that bin • **Minimum** — Minimum value at that bin • **Oldest** — Oldest value at that bin by sensing time • **Latest** — Latest value at that bin by sensing time
Description	Resolution policy that shall be used when more than a single value falls within a given bin of the applicable grid.

X-Path	/GMT_Configuration/Map/Product/Filters/Orbit
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	All
Format	The valid values are: • **All** — All orbit orientations • **Ascending** — Ascending orbit orientation only • **Descending** — Descending orbit orientation only
Description	Orbit orientation the products must have in order to be plotted. If a product with an orbit orientation different from the one here specified is encountered, it will be silently ignored.

X-Path	/GMT_Configuration/Map/Product/Filters/Fill_Value
Type	Real

Occurrences	0 or 1 **Optional**
Units	Those of the selected parameter
Default value	*None*
Format	Any rational number in decimal form.
Description	In some L2 parameters, a special value (e.g. -999.0) is used to indicate the absence of a valid value. This configuration item is used to specify such a value and, as a consequence, any matching values which are encountered among the input data will be silently ignored.

X-Path	/GMT_Configuration/Map/Product/Filters/Filter_A_OS
Type	Int
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	*0*
Format	The valid values are: • 0 The filter is not applied • 1 The filter is applied by checking the FG_CTRL_POOR_RETRIEVAL_1 flag • 2 The filter is applied by checking the FG_CTRL_POOR_RETRIEVAL_2 flag • 3 The filter is applied by checking the FG_CTRL_POOR_RETRIEVAL_3 flag • 4 The filter is applied by checking the FG_CTRL_POOR_RETRIEVAL_4 flag
Description	The Filter_A_OS shall extract successful retrievals: reject if FG_CTRL_POOR_RETRIEVAL_X = 1, where X = 1,2,3 or 4. The filter is applicable to map the following parameters: • SSSx, • Sigma_SSSx, • Tb_42.5w, • Sigma_Tb_42.5w where x=1,2,3 and w=X,Y,H,V.

X-Path	/GMT_Configuration/Map/Product/Filters/Filter_B_OS
Type	Int
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	*0*
Format	The valid values are: • 0 The filter is not applied • 1 The filter is applied by checking the FG_CTRL_POOR_RETRIEVAL_1 and FG_CTRL_POOR_GEOPHYSICAL_1 flags • 2 The filter is applied by checking the FG_CTRL_POOR_RETRIEVAL_2 and FG_CTRL_POOR_GEOPHYSICAL_2 flags • 3 The filter is applied by checking the FG_CTRL_POOR_RETRIEVAL_3 and FG_CTRL_POOR_GEOPHYSICAL_3 flag • 4 The filter is applied by checking the FG_CTRL_POOR_RETRIEVAL_4 and FG_CTRL_POOR_GEOPHYSICAL_4 flag

Description	The Filter_B_OS shall extract good retrievals: reject if FG_CTRL_POOR_RETRIEVAL_X = 1 or FG_CTRL_POOR_GEOPHYSICAL_X = 1, where X = 1,2,3 or 4. The filter is applicable to map the following parameters: • SSSx, • Sigma_SSSx, • Tb_42.5w, • Sigma_Tb_42.5w where x=1,2,3 and w=X,Y,H,V.

X-Path	/GMT_Configuration/Map/Product/Filters/Filter_C_OS/Filter_Option
Type	Int
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	*0*
Format	The valid values are: • 0 The filter is not applied • 1 The filter is applied by checking the DG_QUALITY_SSS1 flag • 2 The filter is applied by checking the DG_QUALITY_SSS2 flag • 3 The filter is applied by checking the DG_QUALITY_SSS3 flag
Description	The Filter_C_OS shall extract the retrievals by quality index: reject if DG_QUALITY_SSSX > defined threshold, where X = 1, 2 or 3 The filter is applicable to map the following parameters: • SSSx, • Sigma_SSSx, • Tb_42.5w, • Sigma_Tb_42.5w where x=1,2,3 and w=X,Y,H,V.

X-Path	/GMT_Configuration/Map/Product/Filters/Filter_C_OS/Quality_Threshold
Type	Real
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	*150*
Format	Any rational number in decimal form
Description	The Quality_Threshold option is used to define the threshold value used by the Filter_C_OS.

5.20 SMOS L2 SOIL MOISTURE DATA ANALYSIS PRODUCTS

5.20.1 GENERAL INFORMATION

The L2 SM Processor generates two types of products:

- The Level 2 Soil Moisture User Data Product (MIR_SMUDP2), whose content consist on SM values, optical thickness, physical temperature, simulated TB, dielectric constants, flags, etc.
- The Level 2 Soil Moisture Data Analysis Product (MIR_SMDAP2) containing information about the retrieval process that is not intended for the external users, but rather for some specific users such as ESL.

Using TB components (in either dual or full polarisation), the incidence angles, as well as Level 1C processor auxiliary data products such as TEC, geomagnetic correction values, and a set of quality flags produced by the Level 1C processor, L2 SM output products are generated for each DGG point and physically consolidated in pole-to-pole segments. Both the L2 Soil Moisture User Data Product and the L2 Soil Moisture Data Analysis Product contain the same number of DGG points as their input Level 1C product.

5.20.2 TYPE AND SIZE

The following SMOS file types are addressed when referring to L2 Soil Moisture Data Analysis products, with their typical size indicated next to each entry:

- MIR_SMDAP2 151,67 MB

5.20.3 FILENAME

The naming convention for SMOS L2 products is described in detail in [AD. 2].

5.20.4 STRUCTURE

The structure of the SMOS L2 products is elaborated in [AD. 2]. Please refer to this document as the main source for information regarding these files.

5.20.5 GMT CONFIGURATION

In addition to the general parameters which can be defined within a map entry, as part of a GMT configuration file, the following filters are applicable when plotting L2 Soil Moisture Data Analysis products:

- Orbit Orbit orientation
- Fill_Value Value used to indicate the absence of valid data

In particular, the details on these, along with the appropriate values for the product type, the parameter to be plotted, and the overlap resolution policy, are provided below:

X-Path	/GMT_Configuration/Map/Product/Type
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (MIR_SMDAP2) are:

	• **MIR_SMDAP2** L2 Soil Moisture Data Analysis Products
Description	Type of the SMOS products to be plotted. If products of any other type are present in the input directory, they will be silently ignored by the GMT.

X-Path	/GMT_Configuration/Map/Product/Parameter
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (MIR_SMDAP2) are: • **Grid_Point_ID** Unique identifier for the grid point • **Latitude** Latitude of the DGG cell's center • **Longitude** Longitude of the DGG cell's center • **Altitude** Altitude of the DGG cell's center • **Mean_FM0_FNO** Mean cover fraction for FNO • **Mean_FM0_FFO** Mean cover fraction for FFO • **Mean_FM0_FWL** Mean cover fraction for FWL • **Mean_FM0_FWO** Mean cover fraction for FWO • **Mean_FM0_FEB** Mean cover fraction for FEB • **Mean_FM0_FTI** Mean cover fraction for FTI • **Mean_FM0_FEU** Mean cover fraction for FEU • **Mean_FM0_FTS** Mean cover fraction for FTS • **Mean_FM0_FTM** Mean cover fraction for FTM • **Mean_FM0_FRZ** Mean cover fraction for FRZ • **Mean_FM0_FSM** Mean cover fraction for FSM • **Mean_FM0_FSW** Mean cover fraction for FSW • **Mean_FM_FNO** Mean cover fraction for FNO • **Mean_FM_FFO** Mean cover fraction for FFO • **Mean_FM_FWL** Mean cover fraction for FWL • **Mean_FM_FWP** Mean cover fraction for FWP • **Mean_FM_FWS** Mean cover fraction for FWS • **Mean_FM_FEB** Mean cover fraction for FEB • **Mean_FM_FTI** Mean cover fraction for FTI • **Mean_FM_FRZ** Mean cover fraction for FRZ • **Mean_FM_FSN** Mean cover fraction for FSN • **Mean_FM_FEU** Mean cover fraction for FEU • **X_Swath** Abscissa of dwell line • **N_TB_Range** Testing against range – count of deleted TB • **RATIO_AVA** Ratio of useful views • **N_Retries** Number of retries • **N_Cleaned** Wild data removed (count)

	• **N_Iterations** Number of iterations to convergence • **PR_Index** Polarization ratio index • **TSurf_Init_Val** Initial value for free parameters • **A_Card_Init_Val** Initial value for free parameters • **SM_Init_Val** Initial value for free parameters • **Tau_Init_Val** Initial value for free parameters • **TTH_Init_Val** Initial value for free parameters • **RTT_Init_Val** Initial value for free parameters • **OMH_Init_Val** Initial value for free parameters • **Diff_Init_Val** Initial value for free parameters • **HR_Init_Val** Initial value for free parameters • **TSurf_Init_Std** Initial STD for free parameters • **A_Card_Init_Std** Initial STD for free parameters • **SM_Init_Std** Initial STD for free parameters • **Tau_Init_Std** Initial STD for free parameters • **TTH_Init_Std** Initial STD for free parameters • **RTT_Init_Std** Initial STD for free parameters • **OMH_Init_Std** Initial STD for free parameters • **Diff_Init_Std** Initial STD for free parameters • **HR_Init_Std** Initial STD for free parameters • **TAU_LV_IN** Read from its current table • **TAU_LV_IN_DQX** Read from its current table • **TAU_FO_IN** Read from its current table • **TAU_FO_IN_DQX** Read from its current table • **HR_IN** Read from its current table • **HR_IN_DQX** Read from its current table • **Tau_Litter** Canopy opacity for litter • **T_Phys** Physical temperature • **M_AVA0** Initial number of BT before filtering • **Num_Incidence_Angles** Number of valid incidence angles used in the retrieval • **Cover_Frac_FM_FNO** Cover fractions for vegetated soil / sand • **Cover_Frac_FM_FFO** Cover fractions for forest • **Cover_Frac_FM_FWL** Cover fractions for wetlands • **Cover_Frac_FM_FWP** Cover fractions for open fresh water • **Cover_Frac_FM_FWS** Cover fractions for open saline water • **Cover_Frac_FM_FEB** Cover fractions for barren • **Cover_Frac_FM_FTI** Cover fractions for permanent ice / snow • **Cover_Frac_FM_FRZ** Cover fractions for frozen • **Cover_Frac_FM_FSN** Cover fractions for snow • **Cover_Frac_FM_FEU** Cover fractions for urban • **FL_Data_Miss** Check fall back options

	• **FL_MVAL0**	Indicate no more retrieval to be done
	• **FL_MVAL**	Indicate no more retrieval to be done
	• **FL_R4_NITM**	Indicate R4 attempted, but failed NITM
	• **FL_R4_KDIA**	Indicate R4 attempted, but failed KDIA
	• **FL_R4_COND**	Indicate R4 attempted, but failed COND
	• **FL_R3_NITM**	Indicate R3 attempted, but failed NITM
	• **FL_R3_KDIA**	Indicate R3 attempted, but failed KDIA
	• **FL_R3_COND**	Indicate R3 attempted, but failed COND
	• **FL_R2_NITM**	Indicate R2 attempted, but failed NITM
	• **FL_R2_KDIA**	Indicate R2 attempted, but failed KDIA
	• **FL_R2_COND**	Indicate R2 attempted, but failed COND
	• **FL_MD_NITM**	Indicate MDa attempted, but failed NITM
	• **FL_MD_KDIA**	Indicate MDa attempted, but failed KDIA
	• **FL_MD_COND**	Indicate MDa attempted, but failed COND
	• **FL_CE**	Computational exceptions
	• **FL_Sun_Point_C**	Used to exclude view
	• **FL_Sun_Glint_FOV_C**	Indicator of possible sun glint effects
	• **FL_R4_RANGE**	A value is out of extended valid range in R4 retrieval
	• **FL_R4_RSTD**	A value DQX is greater than threshold in R4 retrieval
	• **FL_R3_RANGE**	A value is out of extended valid range in R3 retrieval
	• **FL_R3_RSTD**	A value DQX is greater than threshold in R3 retrieval
	• **FL_R2_RANGE**	A value is out of extended valid range in R2 retrieval
	• **FL_R2_RSTD**	A value DQX is greater than threshold in R2 retrieval
	• **FL_MDA_RANGE**	A value is out of extended valid range in MDa retrieval
	• **FL_MDA_RSTD**	A value DQX is greater than threshold in MDa retrieval
Description	Parameter whose data is to be plotted. Further details on their actual meaning, units and interpretation can be found in the respective product specifications ([AD. 1], [AD. 2]).	

X-Path	/GMT_Configuration/Map/Product/Overlap	
Type	String	
Occurrences	0 or 1	**Optional**
Units	N/A	
Default value	Average	
Format	The valid values are:	
	• **Average**	Average all the values at that bin
	• **Deviation**	Standard deviation at that bin
	• **Maximum**	Maximum value at that bin
	• **Minimum**	Minimum value at that bin
	• **Oldest**	Oldest value at that bin by sensing time
	• **Latest**	Latest value at that bin by sensing time

Description	Resolution policy that shall be used when more than a single value falls within a given bin of the applicable grid.

X-Path	/GMT_Configuration/Map/Product/Filters/Orbit
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	All
Format	The valid values are: • **All** All orbit orientations • **Ascending** Ascending orbit orientation only • **Descending** Descending orbit orientation only
Description	Orbit orientation the products must have in order to be plotted. If a product with an orbit orientation different from the one here specified is encountered, it will be silently ignored.

X-Path	/GMT_Configuration/Map/Product/Filters/Fill_Value
Type	Real
Occurrences	0 or 1 **Optional**
Units	Those of the selected parameter
Default value	*None*
Format	Any rational number in decimal form.
Description	In some L2 parameters, a special value (e.g. -999.0) is used to indicate the absence of a valid value. This configuration item is used to specify such a value and, as a consequence, any matching values which are encountered among the input data will be silently ignored.

5.21 SMOS L2 SOIL MOISTURE USER DATA PRODUCTS

5.21.1 GENERAL INFORMATION

The L2 SM Processor generates two types of products:

- The Level 2 Soil Moisture User Data Product (MIR_SMUDP2), whose content consist on SM values, optical thickness, physical temperature, simulated TB, dielectric constants, flags, etc.
- The Level 2 Soil Moisture Data Analysis Product (MIR_SMDAP2) containing information about the retrieval process that is not intended for the external users, but rather for some specific users such as ESL.

Using TB components (in either dual or full polarisation), the incidence angles, as well as Level 1C processor auxiliary data products such as TEC, geomagnetic correction values, and a set of quality flags produced by the Level 1C processor, L2 SM output products are generated for each DGG point and physically consolidated in pole-to-pole segments. Both the L2 Soil Moisture User Data Product and the L2 Soil Moisture Data Analysis Product contain the same number of DGG points as their input Level 1C product.

5.21.2 TYPE AND SIZE

The following SMOS file types are addressed when referring to L2 Soil Moisture User Data products, with their typical size indicated next to each entry:

- MIR_SMUDP2 13,88 MB

5.21.3 FILENAME

The naming convention for SMOS L2 products is described in detail in [AD. 2].

5.21.4 STRUCTURE

The structure of the SMOS L2 products is elaborated in [AD. 2]. Please refer to this document as the main source for information regarding these files.

5.21.5 GMT CONFIGURATION

In addition to the general parameters which can be defined within a map entry, as part of a GMT configuration file, the following filters are applicable when plotting L2 Soil Moisture User Data products:

- Orbit Orbit orientation
- Fill_Value Value used to indicate the absence of valid data

In particular, the details on these, along with the appropriate values for the product type, the parameter to be plotted, and the overlap resolution policy, are provided below:

X-Path	/GMT_Configuration/Map/Product/Type
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (MIR_SMUDP2) are:

	• **MIR_SMUDP2** L2 Soil Moisture User Data Products
Description	Type of the SMOS products to be plotted. If products of any other type are present in the input directory, they will be silently ignored by the GMT.

X-Path	/GMT_Configuration/Map/Product/Parameter
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (MIR_SMUDP2) are: • **Grid_Point_ID** Unique identifier for the grid point • **Latitude** Latitude of the DGG cell's center • **Longitude** Longitude of the DGG cell's center • **Altitude** Altitude of the DGG cell's center • **Soil_Moisture** Retrieved soil moisture value • **Soil_Moisture_DQX** DQX for soil moisture • **Optical_Thickness_Nad** Nadir optical thickness for vegetation layer • **Optical_Thickness_Nad_DQX** DQX for nadir optical thickness • **Surface_Temperature** Surface equivalent temperature • **Surface_Temperature_DQX** DQX for surface equivalent temperature • **TTH** Optical thickness for polarization H • **TTH_DQX** DQX for TTH • **RTT** Ratio of optical thickness coeff. TTH/TTV • **RTT_DQX** DQX for RTT • **Scattering_Albedo_H** Scattering albedo for horizontal polarization • **Scattering_Albedo_H_DQX** DQX for scattering albedo • **DIFF_Albedos** Difference of albedos • **DIFF_Albedos_DQX** DQX for difference of albedos • **Roughness_Param** Roughness parameter estimate • **Roughness_Param_DQX** DQX for roughness parameter estimate • **Dielect_Const_MD_RE** Real part of the dielectric constant from MD • **Dielect_Const_MD_RE_DQX** DQX for real part the dielectric constant • **Dielect_Const_MD_IM** Imaginary part of the dielectric constant • **Dielect_Const_MD_IM_DQX** DQX for imaginary part the dielectric const. • **Dielect_Const_Non_MD_RE** Real part of the dielectric const. not from MD • **Dielect_Const_Non_MD_RE_DQX** DQX for previous field • **Dielect_Const_Non_MD_IM** Imaginary part of the dielectric constant • **Dielect_Const_Non_MD_IM_DQX** DQX for previous field • **TB_ASL_Theta_B_H** Surface level TB for 42.5º and H polarization • **TB_ASL_Theta_B_H_DQX** DQX for surface level TB for H polarization • **TB_ASL_Theta_B_V** Surface level TB for 42.5º and V polarization

	• **TB_ASL_Theta_B_V_DQX** DQX for surface level TB for V polarization • **TB_TOA_Theta_B_H** Top level TB for 42.5º and H polarization • **TB_TOA_Theta_B_H_DQX** DQX for top level TB for H polarization • **TB_TOA_Theta_B_V** Top level TB for 42.5º and V polarization • **TB_TOA_Theta_B_V_DQX**DQX for top level TB for V polarization • **GQX** Global quality index • **Chi_2** Retrieval fit quality index • **Chi_2_P** Chi square high value acceptability prob. • **N_Wild** Number of times that wild data occurred • **M_AVA0** Initial number of TB measurements in L1C • **M_AVA** Number of TB measurements available • **AFP** Mean surface of the antenna footprint ellipses • **N_AF_FOV** Number of views with AF_FOV flag • **N_Sun_Tails** Number of views with Sun_Tails flag • **N_Sun_Glint_Area** Number of views with Sun_Glint_Area flag • **N_Sun_FOV** Number of views with Sun_FOV flag • **N_Software_Error** BT that pass initial filter and have a software error • **N_Instrument_Error** BT that pass initial filter and have an instrument error • **N_ADF_Error** BT that pass initial filter and have an ADF error • **N_Calibration_Error** BT that pass initial filter and have a calibration error • **N_X_Band** BT that pass initial filter and have the X-Band flag on • **N_Sky** Strong galactic source • **S_Tree_1** Branches of decision tree stage 1 • **S_Tree_2** Retrieval R2, R3 or R4 • **Tau_Cur_DQX** Special Tau DQX value • **HR_Cur_DQX** Special HR DQX value • **N_RFI_H** RFI detected – count of deleted TB • **N_RFI_V** RFI detected – count of deleted TB • **RFI_Prob** The probability of RFI contamination • **FL_RFI_Prone_H** DGG current RFI for H pol. above threshold • **FL_RFI_Prone_V** DGG current RFI for V pol. above threshold • **FL_NO_PROD** No products are generated • **FL_RANGE** Retrieval values outside range • **FL_DQX** High retrieval DQX • **FL_Chi_2_P** Poor fit quality • **FL_FARADAY_ROTATION_ANGLE** Source of the Faraday rotation angles • **FL_Non_Nom** Presence of other than nominal soil • **FL_Scene_T** True if any of scene flags is set • **FL_Barren** Presence of rocks • **FL_Topo_S** Presence of strong topography • **FL_Topo_M** Presence of moderate topography

	• **FL_OW** Presence of open water • **FL_Snow_Mix** Presence of mixed snow • **FL_Snow_Wet** Presence of wet snow • **FL_Snow_Dry** Presence of significant dry snow • **FL_Forest** Presence of forest • **FL_Nominal** Presence of nominal soil • **FL_Frost** Presence of frost • **FL_Ice** Presence of permanent ice/snow • **FL_Wetlands** Presence of wetlands • **FL_Flood_Prob** Probable flooding risk • **FL_Urban_Low** Presence of limited urban area • **FL_Urban_High** Presence of large urban area • **FL_Sand** Presence of high sand fraction • **FL_Sea_Ice** Presence of sea ice • **FL_Coast** Presence of large tidal flag • **FL_Occur_T** True if any of occur flags is set • **FL_Litter** Litter suspected • **FL_PR** Interception suspected (pol ratio) • **FL_Intercep** ECMWF indicates interception • **FL_External** Any of the external flags on, or N_SKY non 0 • **FL_Rain** Heavy rain suspected • **FL_TEC** High ionospheric contributions • **FL_TAU_FO** Presence of thick forest • **FL_WINTER_FOREST** Winter forest case selected • **FL_DUAL_RETR_FNO_FFO** Dual retrieval performed • **FL_R4** R4 attempted and failed • **FL_R3** R3 attempted and failed • **FL_R2** R2 attempted and failed • **FL_MD_A** True if MDa failed • **FL_Current_Tau_Nadir_LV** Request to update the associated map • **FL_Current_Tau_Nadir_FO** Request to update the associated map • **FL_Current_HR** Request to update the associated map • **FL_Current_RFI** Request to update the associated map • **FL_Current_Flood** Request to update the associated map • **ST1_S** First stokes param at surface level • **PI_S** Polarization index at surface level • **ST1_ToA** First stokes parameter at top of atmosphere • **PI_ToA** Polarization index at top of atmosphere
Description	Parameter whose data is to be plotted. Further details on their actual meaning, units and interpretation can be found in the respective product specifications ([AD. 1], [AD. 2]).

X-Path	/GMT_Configuration/Map/Product/Overlap
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	Average
Format	The valid values are: • **Average** Average all the values at that bin • **Deviation** Standard deviation at that bin • **Maximum** Maximum value at that bin • **Minimum** Minimum value at that bin • **Oldest** Oldest value at that bin by sensing time • **Latest** Latest value at that bin by sensing time
Description	Resolution policy that shall be used when more than a single value falls within a given bin of the applicable grid.

X-Path	/GMT_Configuration/Map/Product/Filters/Orbit
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	All
Format	The valid values are: • **All** All orbit orientations • **Ascending** Ascending orbit orientation only • **Descending** Descending orbit orientation only
Description	Orbit orientation the products must have in order to be plotted. If a product with an orbit orientation different from the one here specified is encountered, it will be silently ignored.

X-Path	/GMT_Configuration/Map/Product/Filters/Fill_Value
Type	Real
Occurrences	0 or 1 **Optional**
Units	Those of the selected parameter
Default value	*None*
Format	Any rational number in decimal form.
Description	In some L2 parameters, a special value (e.g. -999.0) is used to indicate the absence of a valid value. This configuration item is used to specify such a value and, as a consequence, any matching values which are encountered among the input data will be silently ignored.

X-Path	/GMT_Configuration/Map/Product/Filters/Topography
Type	Int
Occurrences	0 or 1 **Optional**
Units	N/A

Default value	*0*
Format	The valid values are: • 0 Filter is not applied • 1 Filter is to be applied
Description	The Topography filter is used to exclude the parameter values located in cells with strong or moderated topography. The data is retrieved only if FL_TOPO_S equals 0 AND FL_TOPO_M equals 0.

5.22 VTEC MAPS

5.22.1 GENERAL INFORMATION

The VTEC (Vertical Total Electron Content) is the content of electrons in a vertical column of 1 m^2 and is expressed in TEC units (1 TECU = 1e+16 e-/m^2).

In the SMOS DPGS three VTEC ADFs will be available: one for the forecast (AUX_VTEC_P, generated from COPG files), one for the rapid analysis files (AUX_VTEC_R, generated from IGRG files), and another one for the consolidated analysis (AUX_VTEC_C, generated from IGSG files). The AUX_VTEC_P is used in the fast processing centre and for the near real time processing. The AUX_VTEC_R and AUX_VTEC_C will be used in the context of the SMOS data reprocessing. They all share the same ADF specification.

Each ADF is generated from one input IONEX file and therefore contains 13 applicable maps: one every two hours within the corresponding day, centered at 00H, 02H, … , 22H, and 00H, respectively.

5.22.2 TYPE AND SIZE

The following SMOS file types are addressed when referring to VTEC map products, with their typical size indicated next to each entry:

- AUX_VTEC_C 155.89 KB
- AUX_VTEC_P 155.89 KB
- AUX_VTEC_R 155.89 KB

5.22.3 FILENAME

The naming convention for VTEC auxiliary data products is described in detail in [AD. 1].

5.22.4 STRUCTURE

The structure of the VTEC auxiliary data products is elaborated in [AD. 1]. Please refer to this document as the main source for information regarding these files.

5.22.5 GMT CONFIGURATION

In addition to the general parameters which can be defined within a map entry, as part of a GMT configuration file, the following filters are applicable when plotting VTEC auxiliary data products:

- Map_Number Number of the map to be represented

In particular, the details on these, along with the appropriate values for the product type, the parameter to be plotted, and the overlap resolution policy, are provided below:

X-Path	/GMT_Configuration/Map/Product/Type
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (AUX_VTEC_X) are:

	• **AUX_VTEC_X** Vertical Total Electron Content maps
Description	Type of the SMOS products to be plotted. If products of any other type are present in the input directory, they will be silently ignored by the GMT.

X-Path	/GMT_Configuration/Map/Product/Parameter
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (AUX_VTEC_X) are: • **VTEC_value** Vertical Total Electron Content value
Description	Parameter whose data is to be plotted. Further details on their actual meaning, units and interpretation can be found in the respective product specifications ([AD. 1], [AD. 2]).

X-Path	/GMT_Configuration/Map/Product/Overlap
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	Average
Format	The valid values are: • **Average** Average all the values at that bin • **Deviation** Standard deviation at that bin • **Maximum** Maximum value at that bin • **Minimum** Minimum value at that bin • **Oldest** Oldest value at that bin by sensing time • **Latest** Latest value at that bin by sensing time
Description	Resolution policy that shall be used when more than a single value falls within a given bin of the applicable grid.

X-Path	/GMT_Configuration/Map/Product/Filters/Map_Number
Type	Integer
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	1
Format	Any integer number in the range [1, 13].
Description	Number of the map to be represented, among those present in an VTEC auxiliary data product. The Time of Day is computed dynamically from the number of maps in the VTEC file. For the bi-hourly resolution files, with 13 maps, each of these maps is centered at 00H, 02H, … , 20H, 22H and 00H, respectively. For the hourly resolution maps, the maps are centered at each hour (00H, 01H, …).

5.23 ECMWF PRODUCT

5.23.1 GENERAL INFORMATION

The L2 OS and SM Processors use the AUX_ECMWF_ Auxiliary Data Product to store the geophysical parameters coming from the ECMWF forecasts. Each ECMWF Auxiliary File is generated aiming to interpolate the ECMWF model parameters on the ISEA grid and to select the grid cells corresponding to a half-orbit swath. Therefore, for each L1C half-orbit there will be one ECMWF Auxiliary file.

In particular, the number of grid cells per half-orbit are approximately similar to that of L1C (~80000 grid points), though the number of grid points will be slightly bigger as the ADF is actually generated before the information of the corresponding L1C half orbit file is available.

5.23.2 TYPE AND SIZE

The following SMOS file types are addressed when referring to ECMWF products, with their typical size indicated next to each entry:

- AUX_ECMWF_ 22.50 MB

5.23.3 FILENAME

The naming convention for ECMWF auxiliary data products is described in detail in [AD. 2].

5.23.4 STRUCTURE

The structure of the ECMWF auxiliary data products is elaborated in [AD. 2]. Please refer to this document as the main source for information regarding these files.

5.23.5 GMT CONFIGURATION

In addition to the general parameters which can be defined within a map entry, as part of a GMT configuration file, the following filters are applicable when plotting ECMWF auxiliary data products:

- N/A

In particular, the details on these, along with the appropriate values for the product type, the parameter to be plotted, and the overlap resolution policy, are provided below:

X-Path	/GMT_Configuration/Map/Product/Type
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (AUX_ECMWF_) are: • **AUX_ECMWF_** ECMWF product
Description	Type of the SMOS products to be plotted. If products of any other type are present in the input directory, they will be silently ignored by the GMT.

X-Path	/GMT_Configuration/Map/Product/Parameter
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (AUX_ECMWF_) are: • **Grid_Point_ID** Unique identifier of Earth fixed grid • **Latitude** Latitude of the DGG node • **Longitude** Longitude of the DGG node • **Land_Sea_Mask** Fractional land cover • **Sea_Ice_Cover** Sea ice cover • **Surface_Pressure** Surface pressure • **Air_Temperature_2m** 2 meter air temperature • **Sea_Surface_Temperature** Temperature of the water surface • **Total_Coulmn_Water_Vapor** Vertically integrated total water vapour • **Large_Scale_Precipitation** Large scale (stratiform) precipitation (accumulated) • **Convective_Precipitation** Convective precipitation (accumulated) • **Rain_Rate** Rain rate • **Volumetric_Soil_Water_L1** Volumetric soil water level 1 • **Volumetric_Soil_Water_L2** Volumetric soil water level 2 • **Scaled_Volumetric_Soil_Water_L1** Re-scaled volumetric soil water level 1 • **Skin_Reservoir_Content** Skin reservoir content (water) • **Soil_Temperature_L1** Soil temperature level 1 • **Soil_Temperature_L2** Soil temperature level 2 • **Soil_Temperature_L3** Soil temperature level 3 • **Soil_Temperature_L4** Soil temperature level 4 • **Skin_Temperature** Skin temperature • **Temperature_Snow_Layer** Temperature of snow layer • **Ice_Surface_Temperature** Ice surface temperature level • **Snow_Depth** Snow depth (meter of water equivalent) • **Accumutated_Water** Meter of water (accumulated) • **Snow_Density** Snow density • **Wind_Zonal_Lowest_Level** Wind-zonal component at lowest model level • **Wind_Meridional_Lowest_Level** Wind-meridional component at lowest model level • **Temperature_Lowest_Level** Temperature at lowest model level • **Specific_Humidity_Lowest_Level** Specific humidity at lowest model level • **Charnock_Parameter** Charnock parameter as returned by the wave model • **Dewpoint_2m** 2 meter dewpoint temperature • **Sea_Level_Pressure** Sea level pressure • **Northward_Surface_Stress_Rate** North-South surface stress (accumulated) • **Eastward_Surface_Stress_Rate** East-West surface stress (accumulated)

	• **Surface_Shortwave_Radiation_Rate** Net downward shortwave flux at surface • **Surface_Thermal_Radiative_Flux_Rate** Net downward thermal radiative flux • **Surface_Sensible_Heat_Flux_Rate** Net downward sensible heat flux • **Surface_Latent_Heat_Flux_Rate** Net downward latent heat flux • **Drag_Coefficient_With_Waves** Drag coefficient with waves • **Wind_10m_Wave_Model** Wave model 10 meter wind speed • **Peak_Period_1D** Peak period of 1D spectrum • **Significant_Wave_Height** Significant wave height • **Mean_Square_Slope** Mean square slope • **Mean_Period_Wind_Waves** Mean period of wind waves • **Significant_Height_Wind_Waves** Significant height of wind waves • **10m_Neutral_Equivalent_Wind_Zonal** 10m neutral equivalent wind (zonal) • **10m_Neutral_Equivalent_Wind_Meridional** 10m neutral equivalent wind (meridional) • **Roughness_Length** Roughness length • **Friction_Velocity_from_surface_model** Friction velocity from surface layer model • **Friction_Velocity_from_wave_model** Friction velocity from wave model • **Inverse_Wave_Age** Inverse wave age • **Height_Lowest_Model_Level** Height lowest level atmospheric content • **Virtual_Temperature_Lowest_Model_Level** Virtual temperature lowest model level • **Sea_Ice_Cover_Flag** Quality flags • **Surface_Pressure_Flag** • **Air_Temperature_2m_Flag** • **Sea_Surface_Temperature_Flag** • **Total_Column_Water_Vapor_Flag** • **Large_Scale_Precipitation_Flag** • **Convective_Precipitation_Flag** • **Rain_Rate_Flag** • **Volumetric_Soil_Water_L1_Flag** • **Volumetric_Soil_Water_L2_Flag** • **Skin_Reservoir_Content_Flag** • **Soil_Temperature_L1_Flag** • **Soil_Temperature_L2_Flag** • **Soil_Temperature_L3_Flag** • **Soil_Temperature_L4_Flag** • **Skin_Temperature_Flag** • **Temperature_Snow_Layer_Flag** • **Ice_Surface_Temperature_Flag** • **Snow_Depth_Flag** • **Accumutated_Water_Flag** • **Snow_Density_Flag** • **Wind_Zonal_Lowest_Level_Flag**

	• **Wind_Meridional_Lowest_Level_Flag** • **Temperature_Lowest_Level_Flag** • **Specific_Humidity_Lowest_Level_Flag** • **Charnock_Parameter_Flag** • **Dewpoint_2m_Flag** • **Sea_Level_Pressure_Flag** • **Northward_Surface_Stress_Rate_Flag** • **Eastward_Surface_Stress_Rate_Flag** • **Surface_Shortwave_Radiation_Rate_Flag** • **Surface_Thermal_Radiative_Flux_Rate_Flag** • **Surface_Sensible_Heat_Flux_Rate_Flag** • **Surface_Latent_Heat_Flux_Rate_Flag** • **Drag_Coefficient_With_Waves_Flag** • **Wind_10m_Wave_Model_Flag** • **Peak_Period_1D_Flag** • **Significant_Wave_Height_Flag** • **Mean_Square_Slope_Flag** • **Mean_Period_Wind_Waves_Flag** • **Significant_Height_Wind_Waves_Flag** • **10m_Neutral_Equivalent_Wind_Zonal_Flag** • **10m_Neutral_Equivalent_Wind_Meridional_Flag** • **Roughness_Length_Flag** • **Friction_Velocity_from_surface_model_Flag** • **Friction_Velocity_from_wave_model_Flag** • **Inverse_Wave_Age_Flag** • **Height_Lowest_Model_Level_Flag** • **Virtual_Temperature_Lowest_Model_Level_Flag** • **Land_Sea_Mask_Flag** • **Surface_Pressure_Degradation_Flag** Whether the product quality is degraded • **Air_Temperature_2m_Degradation_Flag** • **Sea_Surface_Temperature_Degradation_Flag** • **Total_Column_Water_Vapor_Degradation_Flag** • **Large_Scale_Precipitation_Degradation_Flag** • **Convective_Precipitation_Degradation_Flag** • **Volumetric_Soil_Water_L1_Degradation_Flag** • **Volumetric_Soil_Water_L2_Degradation_Flag** • **Skin_Reservoir_Content_Degradation_Flag** • **Soil_Temperature_L1_Degradation_Flag** • **Soil_Temperature_L2_Degradation_Flag** • **Soil_Temperature_L3_Degradation_Flag** • **Soil_Temperature_L4_Degradation_Flag**

	• **Skin_Temperature_Degradation_Flag** • **Temperature_Snow_Layer_Degradation_Flag** • **Ice_Surface_Temperature_Degradation_Flag** • **Snow_Depth_Degradation_Flag** • **Accumulated_Water_Degradation_Flag** • **Snow_Density_Degradation_Flag** • **Wind_Zonal_Lowest_Level_Degradation_Flag** • **Wind_Meridional_Lowest_Level_Degradation_Flag** • **Temperature_Lowest_Level_Degradation_Flag** • **Specific_Humidity_Lowest_Level_Degradation_Flag** • **Charnock_Parameter_Degradation_Flag** • **Dewpoint_2m_Degradation_Flag** • **Sea_Level_Pressure_Degradation_Flag** • **Northward_Surface_Stress_Rate_Degradation_Flag** • **Eastward_Surface_Stress_Rate_Degradation_Flag** • **Surface_Shortwave_Radiation_Rate_Degradation_Flag** • **Surface_Thermal_Radiative_Flux_Rate_Degradation_Flag** • **Surface_Sensible_Heat_Flux_Rate_Degradation_Flag** • **Surface_Latent_Heat_Flux_Rate_Degradation_Flag** • **Drag_Coefficient_With_Waves_Degradation_Flag** • **Wind_10m_Wave_Model_Degradation_Flag** • **Peak_Period_1D_Degradation_Flag** • **Significant_Wave_Height_Degradation_Flag** • **Mean_Square_Slope_Degradation_Flag** • **Mean_Period_Wind_Waves_Degradation_Flag** • **Significant_Height_Wind_Waves_Degradation_Flag** • **10m_Neutral_Equivalent_Wind_Zonal_Degradation_Flag** • **10m_Neutral_Equivalent_Wind_Meridional_Degradation_Flag** • **Roughness_Length_Degradation_Flag** • **Friction_Velocity_from_surface_model_Degradation_Flag** • **Friction_Velocity_from_wave_model_Degradation_Flag** • **Inverse_Wave_Age_Degradation_Degradation_Flag** • **Height_Lowest_Model_Level_Degradation_Flag** • **Virtual_Temperature_Lowest_Model_Level_Degradation_Flag**
Description	Parameter whose data is to be plotted. Further details on their actual meaning, units and interpretation can be found in the respective product specifications ([AD. 1], [AD. 2]).

X-Path	/GMT_Configuration/Map/Product/Overlap
Type	String
Occurrences	0 or 1 **Optional**

Units	N/A
Default value	Average
Format	The valid values are: • **Average** Average all the values at that bin • **Deviation** Standard deviation at that bin • **Maximum** Maximum value at that bin • **Minimum** Minimum value at that bin • **Oldest** Oldest value at that bin by sensing time • **Latest** Latest value at that bin by sensing time
Description	Resolution policy that shall be used when more than a single value falls within a given bin of the applicable grid.

X-Path	/GMT_Configuration/Map/Product/Filters/Fill_Value
Type	Real
Occurrences	0 or 1 **Optional**
Units	Those of the selected parameter
Default value	*None*
Format	Any rational number in decimal form.
Description	In some ECMWF parameters, a special value (e.g. 0.0) is used to indicate the absence of a valid value. This configuration item is used to specify such a value and, as a consequence, any matching values which are encountered among the input data will be silently ignored.

5.24 DFFG FRACTIONS PRODUCT

5.24.1 GENERAL INFORMATION

The AUX_DFFFRA Auxiliary Data Product provides the percentage equivalents of 10 fractions and their associated land cover class codes, along with the definition and specification parameters, to each DFFG. The information is given at DFFG cell level.

The considered fractions are listed below:

- FNO: Vegetated soil + sand (nominal fraction)
- FFO: Forest
- FWL: Wetlands
- FWP: Open fresh water
- FWS: Open Saline Water
- FEB: Barren
- FEI: Ice and Permanent Snow
- FEU: Urban
- FTS: Strong Topography
- FTM: Moderate Topography

Note that neither FTS nor FTM have associated class codes.

5.24.2 TYPE AND SIZE

The following SMOS file types are addressed when referring to DFFG fractions products, with their typical size indicated next to each entry:

- AUX_DFFFRA 671.18 MB

5.24.3 FILENAME

The naming convention for DFFG fractions auxiliary data products is described in detail in [AD. 2].

5.24.4 STRUCTURE

The structure of the DFFG fractions auxiliary data products is elaborated in [AD. 2]. Please refer to this document as the main source for information regarding these files.

5.24.5 GMT CONFIGURATION

In addition to the general parameters which can be defined within a map entry, as part of a GMT configuration file, the following filters are applicable when plotting DFFG fractions auxiliary data products:

- N/A

In particular, the details on these, along with the appropriate values for the product type, the parameter to be plotted, and the overlap resolution policy, are provided below:

X-Path	/GMT_Configuration/Map/Product/Type

Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (AUX_DFFFRA) are: • **AUX_DFFFRA** DFFG fractions product
Description	Type of the SMOS products to be plotted. If products of any other type are present in the input directory, they will be silently ignored by the GMT.

X-Path	/GMT_Configuration/Map/Product/Parameter
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (AUX_DFFFRA) are: • **FNO** Vegetated soil + sand • **FFO** Percentage of forest fraction • **FWL** Percentage of wetlands fraction • **FWP** Percentage of open fresh water fraction • **FWS** Percentage of open saline water fraction • **FEB** Percentage of barren fraction • **FEI** Percentage of ice and permanent snow fraction • **FEU** Percentage of urban fraction • **FTS** Percentage of strong topography fraction • **FTM** Percentage of moderate topography fraction
Description	Parameter whose data is to be plotted. Further details on their actual meaning, units and interpretation can be found in the respective product specifications ([AD. 1], [AD. 2]).

X-Path	/GMT_Configuration/Map/Product/Overlap
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	Average
Format	The valid values are: • **Average** Average all the values at that bin • **Deviation** Standard deviation at that bin • **Maximum** Maximum value at that bin • **Minimum** Minimum value at that bin • **Oldest** Oldest value at that bin by sensing time • **Latest** Latest value at that bin by sensing time

Description	Resolution policy that shall be used when more than a single value falls within a given bin of the applicable grid.

X-Path	/GMT_Configuration/Map/Product/Grid
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	DGG
Format	The valid values are: • **DGG** Discrete Global Grid • **DFFG** Discrete Flexible Fine Grid
Description	Grid definition to be used when plotting data from input products based upon the DFFG. In particular, the DGG definition is used by default to geolocate the data parsed from that products, due to the amount of memory required otherwise, but the present parameter allows to override such approach.

5.25 DFFG LAI PRODUCT

5.25.1 GENERAL INFORMATION

The AUX_DFFLAI Auxiliary Data Product provides value for the Leaf Area Index (LAI) parameter for each DFFG point. The effects of vegetation on microwave emission as measured from above the canopy are two-fold. The vegetation may absorb or scatter the radiation emanating from the soil, but it also emits its own radiation. In areas of sufficiently dense canopy, the emitted soil radiation is masked, and the observed emissivity will largely be due to the vegetation's emissions rather than the soil's.

These effects are computed using the Leaf Area Index (LAI). For broadleaf canopies, LAI is defined as the one-sided-green-leaf area per unit of ground area. For needle canopies, LAI is defined as the projected needle-leaf area per unit of ground area. Thus LAI is considered an important structural property of a plant canopy. LAI values are used to compute the optical opacity of the vegetation canopy.

The contents of this product are supplied by MODIS, and the data content is updated every 8 days.

5.25.2 TYPE AND SIZE

The following SMOS file types are addressed when referring to DFFG LAI products, with their typical size indicated next to each entry:

- AUX_DFFLAI 227.18 MB

5.25.3 FILENAME

The naming convention for DFFG LAI auxiliary data products is described in detail in [AD. 2].

5.25.4 STRUCTURE

The structure of the DFFG LAI auxiliary data products is elaborated in [AD. 2]. Please refer to this document as the main source for information regarding these files.

5.25.5 GMT CONFIGURATION

In addition to the general parameters which can be defined within a map entry, as part of a GMT configuration file, the following filters are applicable when plotting DFFG LAI auxiliary data products:

- N/A

In particular, the details on these, along with the appropriate values for the product type, the parameter to be plotted, and the overlap resolution policy, are provided below:

X-Path	/GMT_Configuration/Map/Product/Type
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (AUX_DFFLAI) are: • **AUX_DFFLAI** DFFG LAI product
Description	Type of the SMOS products to be plotted. If products of any other type are present in the input directory,

	they will be silently ignored by the GMT.

X-Path	/GMT_Configuration/Map/Product/Parameter
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (AUX_DFFLAI) are: • **LAI** Index used in computing vegetation cover opacity • **Days_Since_Last_MODIS_Update** Days since a valid MODIS LAI value was available • **MODIS_Flag** Whether the data comes from MODIS or AUX_ECOLAI • **Age_Flag** Whether the last MODIS LAI value was too old • **Water_Flag** Whether the DFFG pixel is 100% over water
Description	Parameter whose data is to be plotted. Further details on their actual meaning, units and interpretation can be found in the respective product specifications ([AD. 1], [AD. 2]).

X-Path	/GMT_Configuration/Map/Product/Overlap
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	Average
Format	The valid values are: • **Average** Average all the values at that bin • **Deviation** Standard deviation at that bin • **Maximum** Maximum value at that bin • **Minimum** Minimum value at that bin • **Oldest** Oldest value at that bin by sensing time • **Latest** Latest value at that bin by sensing time
Description	Resolution policy that shall be used when more than a single value falls within a given bin of the applicable grid.

X-Path	/GMT_Configuration/Map/Product/Grid
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	DGG
Format	The valid values are: • **DGG** Discrete Global Grid • **DFFG** Discrete Flexible Fine Grid
Description	Grid definition to be used when plotting data from input products based upon the DFFG. In particular, the DGG definition is used by default to geolocate the data parsed from that products, due to the amount of

	memory required otherwise, but the present parameter allows to override such approach.

5.26 DFFG LAI MAX PRODUCT

5.26.1 GENERAL INFORMATION

This product is very similar to the AUX_DFFLAI Auxiliary Data Product, but stores values for the maximum LAI parameters (LAI Max) instead. The average of the LAI values for July is considered to be the LAI Max value for the northern hemisphere, while the average of the LAI values for January are the LAI Max for the southern hemisphere.

Offset and scaling factor are then applied to those values for deriving the actual values of LAI Max parameters for all DFFG cells.

5.26.2 TYPE AND SIZE

The following SMOS file types are addressed when referring to DFFG LAI Max products, with their typical size indicated next to each entry:

- AUX_DFFLMX 43.48 MB

5.26.3 FILENAME

The naming convention for DFFG LAI Max auxiliary data products is described in detail in [AD. 2].

5.26.4 STRUCTURE

The structure of the DFFG LAI Max auxiliary data products is elaborated in [AD. 2]. Please refer to this document as the main source for information regarding these files.

5.26.5 GMT CONFIGURATION

In addition to the general parameters which can be defined within a map entry, as part of a GMT configuration file, the following filters are applicable when plotting DFFG LAI Max auxiliary data products:

- N/A

In particular, the details on these, along with the appropriate values for the product type, the parameter to be plotted, and the overlap resolution policy, are provided below:

X-Path	/GMT_Configuration/Map/Product/Type
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (AUX_DFFLMX) are: • **AUX_DFFLMX** DFFG LAI Max product
Description	Type of the SMOS products to be plotted. If products of any other type are present in the input directory, they will be silently ignored by the GMT.

X-Path	/GMT_Configuration/Map/Product/Parameter

Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (AUX_DFFLMX) are: • **LAI_Max** Maximum annual LAI for the given DFFG cell
Description	Parameter whose data is to be plotted. Further details on their actual meaning, units and interpretation can be found in the respective product specifications ([AD. 1], [AD. 2]).

X-Path	/GMT_Configuration/Map/Product/Overlap
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	Average
Format	The valid values are: • **Average** Average all the values at that bin • **Deviation** Standard deviation at that bin • **Maximum** Maximum value at that bin • **Minimum** Minimum value at that bin • **Oldest** Oldest value at that bin by sensing time • **Latest** Latest value at that bin by sensing time
Description	Resolution policy that shall be used when more than a single value falls within a given bin of the applicable grid.

X-Path	/GMT_Configuration/Map/Product/Grid
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	DGG
Format	The valid values are: • **DGG** Discrete Global Grid • **DFFG** Discrete Flexible Fine Grid
Description	Grid definition to be used when plotting data from input products based upon the DFFG. In particular, the DGG definition is used by default to geolocate the data parsed from that products, due to the amount of memory required otherwise, but the present parameter allows to override such approach.

5.27 DFFG SOIL PROPERTIES PRODUCT

5.27.1 GENERAL INFORMATION

The AUX_DFFSOI Auxiliary Data Product supplies values for the parameters of soil properties at the DFFG scale. This product provides, for each DFFG cell:

- Percentages of sand and clay;
- mass of dry soil per unit bulk volume (bulk density parameter (ρb));
- w0 and bw0: interpolating temperature coefficients that depend on soil texture and structure;
- XMVT, a transition moisture point, is a function of the sand, S, and the clay, C, fractions. It is for computing the HR(SM): roughness as a piecewise function of SM;
- FC, the field moisture capacity, is also a function of the sand, S, and the clay, C, fractions. It is for computing the HR(SM): roughness as a piecewise function of SM.

This is a static product and starting with L2 SM processor v06.00, the user has the option to use it instead of AUX_SOIL_P.

5.27.2 TYPE AND SIZE

The following SMOS file types are addressed when referring to DFFG Soil Properties products, with their typical size indicated next to each entry:

- AUX_DFFSOI 449.54 MB

5.27.3 FILENAME

The naming convention for DFFG Soil Properties auxiliary data products is described in detail in [AD. 2].

5.27.4 STRUCTURE

The structure of the DFFG Soil Properties auxiliary data products is elaborated in [AD. 2]. Please refer to this document as the main source for information regarding these files.

5.27.5 GMT CONFIGURATION

In addition to the general parameters which can be defined within a map entry, as part of a GMT configuration file, the following filters are applicable when plotting DFFG Soil Properties auxiliary data products:

- N/A

In particular, the details on these, along with the appropriate values for the product type, the parameter to be plotted, and the overlap resolution policy, are provided below:

X-Path	/GMT_Configuration/Map/Product/Type
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (AUX_DFFSOI) are:

	• **AUX_DFFSOI** DFFG Soil Properties product
Description	Type of the SMOS products to be plotted. If products of any other type are present in the input directory, they will be silently ignored by the GMT.

X-Path	/GMT_Configuration/Map/Product/Parameter
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (AUX_DFFSOI) are: • **PC_Sand** Percentage of sand • **PC_Clay** Percentage of clay • **Soil_Bulk_Den** Soil Bulk density, i.e. mass of dry soil per unit bulk volume • **W_0** Interpolating temperature coefficient • **B_W0** Interpolating temperature coefficient • **XMVT** Soil parameter that has relationship with soil moisture and surface roughness
Description	Parameter whose data is to be plotted. Further details on their actual meaning, units and interpretation can be found in the respective product specifications ([AD. 1], [AD. 2]).

X-Path	/GMT_Configuration/Map/Product/Overlap
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	Average
Format	The valid values are: • **Average** Average all the values at that bin • **Deviation** Standard deviation at that bin • **Maximum** Maximum value at that bin • **Minimum** Minimum value at that bin • **Oldest** Oldest value at that bin by sensing time • **Latest** Latest value at that bin by sensing time
Description	Resolution policy that shall be used when more than a single value falls within a given bin of the applicable grid.

X-Path	/GMT_Configuration/Map/Product/Grid
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	DGG
Format	The valid values are:

	• **DGG** Discrete Global Grid • **DFFG** Discrete Flexible Fine Grid
Description	Grid definition to be used when plotting data from input products based upon the DFFG. In particular, the DGG definition is used by default to geolocate the data parsed from that products, due to the amount of memory required otherwise, but the present parameter allows to override such approach.

5.28 DFFG SNOW PRODUCT

5.28.1 GENERAL INFORMATION

The AUX_DFFSNO Auxiliary Data Product supplies percentage of snow coverage for each DFFG cell. This product is based on IMS (NOAA) products available for the northern hemisphere on a daily basis.

This is a dynamic product and needs to be updated regularly.

5.28.2 TYPE AND SIZE

The following SMOS file types are addressed when referring to DFFG Snow products, with their typical size indicated next to each entry:

- AUX_DFFSNO 42.22 MB

5.28.3 FILENAME

The naming convention for DFFG Snow auxiliary data products is described in detail in [AD. 2].

5.28.4 STRUCTURE

The structure of the DFFG Snow auxiliary data products is elaborated in [AD. 2]. Please refer to this document as the main source for information regarding these files.

5.28.5 GMT CONFIGURATION

In addition to the general parameters which can be defined within a map entry, as part of a GMT configuration file, the following filters are applicable when plotting DFFG Snow auxiliary data products:

- N/A

In particular, the details on these, along with the appropriate values for the product type, the parameter to be plotted, and the overlap resolution policy, are provided below:

X-Path	/GMT_Configuration/Map/Product/Type
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (AUX_DFFSNO) are: • **AUX_DFFSNO** DFFG Snow product
Description	Type of the SMOS products to be plotted. If products of any other type are present in the input directory, they will be silently ignored by the GMT.

X-Path	/GMT_Configuration/Map/Product/Parameter
Type	String
Occurrences	1 **Required**

Units	N/A
Default value	N/A
Format	The valid values for this type of product (AUX_DFFSNO) are: • **SnowPercentage** Percentage of snow cover
Description	Parameter whose data is to be plotted. Further details on their actual meaning, units and interpretation can be found in the respective product specifications ([AD. 1], [AD. 2]).

X-Path	/GMT_Configuration/Map/Product/Overlap
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	Average
Format	The valid values are: • **Average** Average all the values at that bin • **Deviation** Standard deviation at that bin • **Maximum** Maximum value at that bin • **Minimum** Minimum value at that bin • **Oldest** Oldest value at that bin by sensing time • **Latest** Latest value at that bin by sensing time
Description	Resolution policy that shall be used when more than a single value falls within a given bin of the applicable grid.

X-Path	/GMT_Configuration/Map/Product/Grid
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	DGG
Format	The valid values are: • **DGG** Discrete Global Grid • **DFFG** Discrete Flexible Fine Grid
Description	Grid definition to be used when plotting data from input products based upon the DFFG. In particular, the DGG definition is used by default to geolocate the data parsed from that products, due to the amount of memory required otherwise, but the present parameter allows to override such approach.

X-Path	/GMT_Configuration/Map/Product/Filters/Fill_Value
Type	Real
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	N/A
Format	Any rational number in decimal form.
Description	Due to memory limitations the snow percentage values in the South Hemisphere, which have the

	missing value of 255, are silently skipped. Therefore, a "Fill_Value" of 0 is used for the AUX_DFFSNO products, to not display the empty data in the North Hemisphere and make the display more meaningful.

5.29 DGG CURRENT TAU NADIR LV PRODUCT

5.29.1 GENERAL INFORMATION

This product provides values of parameters of the optical thickness (Tau) value of Low Vegetation Area for each DGG cell along with other associated parameter values: the DQX of the Tau (retrieval error estimate associated with Tau), Decission Tree retrieval branch number and a date stamp. Optical thickness is used in L2 to derive simulated TB at the nadir point for the lower vegetation (LV) cover fractions.

When Tau is a free parameter, the retrieval quality is better the more-up-to-date the value of the Tau used. The most up-to-date Tau in the current retrieval will always be the one just computed during the last successful retrieval. For the very first retrieval in the cycle, for which no previous retrieval data exists, all parameters are set to "NULL" values. Offset and scaling factor are then applied to those values to derive the actual parameter values.

This data is provided by SMOS L2 internal processing and updated every day. When the retrieval of Tau_Nadir is possible and accurate, post-processing will update this product with the retrieval values.

5.29.2 TYPE AND SIZE

The following SMOS file types are addressed when referring to DGG Current Tau Nadir LV products, with their typical size indicated next to each entry:

- AUX_DGGTLV 14.07 MB

5.29.3 FILENAME

The naming convention for DGG Current Tau Nadir LV auxiliary data products is described in detail in [AD. 2].

5.29.4 STRUCTURE

The structure of the DGG Current Tau Nadir LV auxiliary data products is elaborated in [AD. 2]. Please refer to this document as the main source for information regarding these files.

5.29.5 GMT CONFIGURATION

In addition to the general parameters which can be defined within a map entry, as part of a GMT configuration file, the following filters are applicable when plotting DGG Current Tau Nadir LV auxiliary data products:

- N/A

In particular, the details on these, along with the appropriate values for the product type, the parameter to be plotted, and the overlap resolution policy, are provided below:

X-Path	/GMT_Configuration/Map/Product/Type
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (AUX_DGGTLV) are:

	• **AUX_DGGTLV** DGG Current Tau Nadir LV product
Description	Type of the SMOS products to be plotted. If products of any other type are present in the input directory, they will be silently ignored by the GMT.

X-Path	/GMT_Configuration/Map/Product/Parameter
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (AUX_DGGTLV) are: • **Grid_Point_ID** Unique identifier for the Earth fixed grid point • **Latitude** Latitude of the DGG node • **Longitude** Longitude of the DGG node • **Tau_Nad_LV** Optical thickness (Tau) of Low Vegetation area • **Tau_Nad_LV_Asc** Low vegetation tau at nadir obtained from ascending MIR_SMUDP2 • **Tau_Nad_LV_Desc** Low vegetation tau at nadir obtained from descending MIR_SMUDP2 • **Tau_Nad_LV_DQX** Retrieval error estimate associated with Tau • **Tau_Nad_LV_DQX_Asc** DQX obtained from ascending MIR_SMUDP2 • **Tau_Nad_LV_DQX_Desc** DQX obtained from descending MIR_SMUDP2 • **DT_Branch_LV** Decision tree branch fraction code • **DT_Branch_LV_Asc** Decision tree branch of DGG node obtained from ascending MIR_SMUDP2. • **DT_Branch_LV_Desc** Decision tree branch of DGG node obtained from descending MIR_SMUDP2. • **Date_Stamp_LV** Number of hours that this value is valid • **Date_Stamp_LV_Asc** The day at which the product is acquired from ascending MIR_SMUDP2. • **Date_Stamp_LV_Desc** The day at which the product is acquired from descending MIR_SMUDP2.
Description	Parameter whose data is to be plotted. Further details on their actual meaning, units and interpretation can be found in the respective product specifications ([AD. 1], [AD. 2]).

X-Path	/GMT_Configuration/Map/Product/Overlap
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	Average
Format	The valid values are: • **Average** Average all the values at that bin • **Deviation** Standard deviation at that bin • **Maximum** Maximum value at that bin

	• **Minimum** Minimum value at that bin • **Oldest** Oldest value at that bin by sensing time • **Latest** Latest value at that bin by sensing time
Description	Resolution policy that shall be used when more than a single value falls within a given bin of the applicable grid.

X-Path	/GMT_Configuration/Map/Product/Filters/Fill_Value
Type	Real
Occurrences	0 or 1 **Optional**
Units	Those of the selected parameter
Default value	*None*
Format	Any rational number in decimal form.
Description	In AUX_DGGTLV parameters, a special value (e.g. 65535, 255) is used to indicate the absence of a valid value. This configuration item is used to specify such a value and, as a consequence, any matching values which are encountered among the input data will be silently ignored.

5.30 DGG CURRENT TAU NADIR FO PRODUCT

5.30.1 GENERAL INFORMATION

AUX_DGGTFO_ Auxiliary Data Product provides the values of parameters of the optical thickness (Tau) value for Forest are for each DGG cell, along with other associated parameter values: the DQX (retrieval error estimated associated with Tau), DT retrieval branch number and a date stamp.

The forest cover fraction also uses Tau to derive simulated TB. When Tau is a free parameter, the retrieval quality is better the more up-to-date the value of the Tau used, in the same way as described for Lower Vegetation. Offset and scaling factor are then applied to those values to derive the actual parameter values.

5.30.2 TYPE AND SIZE

The following SMOS file types are addressed when referring to DGG Current Tau Nadir FO products, with their typical size indicated next to each entry:

- AUX_DGGTFO 14.07 MB

5.30.3 FILENAME

The naming convention for DGG Current Tau Nadir FO auxiliary data products is described in detail in [AD. 2].

5.30.4 STRUCTURE

The structure of the DGG Current Tau Nadir FO auxiliary data products is elaborated in [AD. 2]. Please refer to this document as the main source for information regarding these files.

5.30.5 GMT CONFIGURATION

In addition to the general parameters which can be defined within a map entry, as part of a GMT configuration file, the following filters are applicable when plotting DGG Current Tau Nadir FO auxiliary data products:

- N/A

In particular, the details on these, along with the appropriate values for the product type, the parameter to be plotted, and the overlap resolution policy, are provided below:

X-Path	/GMT_Configuration/Map/Product/Type
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (AUX_DGGTFO) are: • **AUX_DGGTFO** DGG Current Tau Nadir FO product
Description	Type of the SMOS products to be plotted. If products of any other type are present in the input directory, they will be silently ignored by the GMT.

X-Path	/GMT_Configuration/Map/Product/Parameter

Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (AUX_DGGTFO) are: • **Grid_Point_ID** Unique identifier for the Earth fixed grid point • **Latitude** Latitude of the DGG node • **Longitude** Longitude of the DGG node • **Tau_Nad_FO** Optical thickness (Tau) of Forest area • **Tau_Nad_FO_Asc** Forest tau at nadir obtained from ascending MIR_SMUDP2 • **Tau_Nad_FO_Desc** Forest tau at nadir obtained from descending MIR_SMUDP2 • **Tau_Nad_FO_DQX** Retrieval error estimate associated with Tau • **Tau_Nad_FO_DQX_Asc** DQX obtained from ascending MIR_SMUDP2 • **Tau_Nad_FO_DQX_Desc** DQX obtained from descending MIR_SMUDP2 • **DT_Branch_FO** Decision tree branch fraction code • **DT_Branch_FO_Asc** Decision Tree branch of DGG node obtained from ascending MIR_SMUDP2 • **DT_Branch_FO_Desc** Decision Tree branch of DGG node obtained from descending MIR_SMUDP2 • **Date_Stamp_FO** Number of hours that this value is valid • **Date_Stamp_FO_Asc** The day at which the product is acquired from ascending MIR_SMUDP2. • **Date_Stamp_FO_Desc** The day at which the product is acquired from descending MIR_SMUDP2.
Description	Parameter whose data is to be plotted. Further details on their actual meaning, units and interpretation can be found in the respective product specifications ([AD. 1], [AD. 2]).

X-Path	/GMT_Configuration/Map/Product/Overlap
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	Average
Format	The valid values are: • **Average** Average all the values at that bin • **Deviation** Standard deviation at that bin • **Maximum** Maximum value at that bin • **Minimum** Minimum value at that bin • **Oldest** Oldest value at that bin by sensing time • **Latest** Latest value at that bin by sensing time
Description	Resolution policy that shall be used when more than a single value falls within a given bin of the

	applicable grid.

X-Path	/GMT_Configuration/Map/Product/Filters/Fill_Value
Type	Real
Occurrences	0 or 1 **Optional**
Units	Those of the selected parameter
Default value	*None*
Format	Any rational number in decimal form.
Description	In AUX_DGGTFO parameters, a special value (e.g. 65535, 255) is used to indicate the absence of a valid value. This configuration item is used to specify such a value and, as a consequence, any matching values which are encountered among the input data will be silently ignored.

5.31 DGG CURRENT ROUGHNESS H PRODUCT

5.31.1 GENERAL INFORMATION

This product provides supplies values of parameters of the roughness parameter HR for each DGG cell, along with other associated DECISion Tree retrieval branch number and a date stamp.

To correct the effects of surface roughness on TB, a land surface parameter (the function of the soil composition, soil texture properties, frequency and the polarization mode of the observing sensor) is used.

5.31.2 TYPE AND SIZE

The following SMOS file types are addressed when referring to DGG Current Roughness H products, with their typical size indicated next to each entry:

- AUX_DGGROU 14.08 MB

5.31.3 FILENAME

The naming convention for DGG Current Roughness H auxiliary data products is described in detail in [AD. 2].

5.31.4 STRUCTURE

The structure of the DGG Current Roughness H auxiliary data products is elaborated in [AD. 2]. Please refer to this document as the main source for information regarding these files.

5.31.5 GMT CONFIGURATION

In addition to the general parameters which can be defined within a map entry, as part of a GMT configuration file, the following filters are applicable when plotting DGG Current Roughness H auxiliary data products:

- N/A

In particular, the details on these, along with the appropriate values for the product type, the parameter to be plotted, and the overlap resolution policy, are provided below:

X-Path	/GMT_Configuration/Map/Product/Type
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (AUX_DGGROU) are: • **AUX_DGGROU** DGG Current Roughness H product
Description	Type of the SMOS products to be plotted. If products of any other type are present in the input directory, they will be silently ignored by the GMT.

X-Path	/GMT_Configuration/Map/Product/Parameter
Type	String

Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (AUX_DGGROU) are: • **Grid_Point_ID** Unique identifier for the Earth fixed grid point • **Latitude** Latitude of the DGG node • **Longitude** Longitude of the DGG node • **HR** Roughness parameter • **HR_Asc** Roughness obtained from ascending MIR_SMUDP2 • **HR_Desc** Roughness obtained from descending MIR_SMUDP2 • **HR_DQX** Roughness parameter DQX • **HR_DQX_Asc** DQX obtained from ascending MIR_SMUDP2 • **HR_DQX_Desc** DQX obtained from descending MIR_SMUDP2 • **DT_Branch_HR** Decision tree branch fraction code • **DT_Branch_HR_Asc** Decision tree branch of DGG node obtained from ascending MIR_SMUDP2. • **DT_Branch_HR_Desc** Decision tree branch of DGG node obtained from descending MIR_SMUDP2. • **Date_Stamp_HR** The day at which the product is acquired • **Date_Stamp_HR_Asc** The day at which the product is acquired from ascending MIR_SMUDP2. **Date_Stamp_HR_Desc** The day at which the product is acquired from descending MIR_SMUDP2.
Description	Parameter whose data is to be plotted. Further details on their actual meaning, units and interpretation can be found in the respective product specifications ([AD. 1], [AD. 2]).

X-Path	/GMT_Configuration/Map/Product/Overlap
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	Average
Format	The valid values are: • **Average** Average all the values at that bin • **Deviation** Standard deviation at that bin • **Maximum** Maximum value at that bin • **Minimum** Minimum value at that bin • **Oldest** Oldest value at that bin by sensing time • **Latest** Latest value at that bin by sensing time
Description	Resolution policy that shall be used when more than a single value falls within a given bin of the applicable grid.

X-Path	/GMT_Configuration/Map/Product/Filters/Fill_Value

Type	Real
Occurrences	0 or 1 **Optional**
Units	Those of the selected parameter
Default value	*None*
Format	Any rational number in decimal form.
Description	In AUX_DGGROU parameters, a special value (e.g. 65535, 255) is used to indicate the absence of a valid value. This configuration item is used to specify such a value and, as a consequence, any matching values which are encountered among the input data will be silently ignored.

5.32 DGG CURRENT RFI PRODUCT

5.32.1 GENERAL INFORMATION

A passive microwave sensor detects the naturally emitted microwave energy within its field of view (FOV) and thus can detect RFI at the L-band frequency. At times, the RFI can be so strong as to make the data recorded for that FOV useless or meaningless. For SMOS mission, the measured TB detected by the passive microwave sensor may contain such a significant portion of RFI that it can have a major impact on the usefulness of the data. It is therefore useful to capture numbers impacting the influence of RFI on FOVs.

The AUX_DGGRFI Auxiliary Data Product supplies for each DGG cell the Radio Frequency Interferences counters which indicate Radio Frequency Interference (RFI) presence within the DGG cell.

This product is generated from the Level 2 Soil Moisture User Data Product.

5.32.2 TYPE AND SIZE

The following SMOS file types are addressed when referring to DGG Current RFI products, with their typical size indicated next to each entry:

- AUX_DGGRFI 18.77 MB

5.32.3 FILENAME

The naming convention for DGG Current RFI auxiliary data products is described in detail in [AD. 2].

5.32.4 STRUCTURE

The structure of the DGG Current RFI auxiliary data products is elaborated in [AD. 2]. Please refer to this document as the main source for information regarding these files.

5.32.5 GMT CONFIGURATION

In addition to the general parameters which can be defined within a map entry, as part of a GMT configuration file, the following filters are applicable when plotting DGG Current RFI auxiliary data products:

- N/A

In particular, the details on these, along with the appropriate values for the product type, the parameter to be plotted, and the overlap resolution policy, are provided below:

X-Path	/GMT_Configuration/Map/Product/Type
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (AUX_DGGRFI) are: • **AUX_DGGRFI** DGG Current RFI product
Description	Type of the SMOS products to be plotted. If products of any other type are present in the input directory, they will be silently ignored by the GMT.

X-Path	/GMT_Configuration/Map/Product/Parameter
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (AUX_DGGRFI) are: • **Grid_Point_ID** Unique identifier for the Earth fixed grid point • **Latitude** Latitude of the DGG node • **Longitude** Longitude of the DGG node • **N_Snap** Accumulated valid snapshots from the UDPs • **N_Snap_Asc** Accumulated valid snapshots (for ascending orbits) from the UDPs • **N_Snap_Desc** Accumulated valid snapshots (for descending orbits) from the UDPs • **N_RFI_H** Number of FOVs considered significantly affected by RFI in horizontal polarization • **N_RFI_X_Asc** Accumulated number of snapshots (for ascending orbits) considered significantly affected by RFI in X polarization • **N_RFI_X_Desc** Accumulated number of snapshots (for descending orbits) considered significantly affected by RFI in X polarization • **N_RFI_V** Number of FOVs considered significantly affected by RFI in vertical polarization • **N_RFI_Y_Asc** Accumulated number of snapshots (for ascending orbits) considered significantly affected by RFI in Y polarization. • **N_RFI_Y_Desc** Accumulated number of snapshots (for descending orbits) considered significantly affected by RFI in Y polarization. • **Normalized_RFI** Normalized number of FOVs considered significantly affected by RFI. The parameter is computed as (N_RFI_H + N_RFI_V)/N_Snap. • **Normalized_RFI_Asc** Normalized number of FOVs considered significantly affected by RFI (for ascending orbits). The parameter is computed as (N_RFI_X_Asc + N_RFI_Y_Asc)/N_Snap_Asc • **Normalized_RFI_Desc** Normalized number of FOVs considered significantly affected by RFI (for ascending orbits). The parameter is computed as (N_RFI_X_Desc + N_RFI_Y_Desc)/N_Snap_Desc
Description	Parameter whose data is to be plotted. Further details on their actual meaning, units and interpretation can be found in the respective product specifications ([AD. 1], [AD. 2]).

X-Path	/GMT_Configuration/Map/Product/Overlap
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	Average
Format	The valid values are: • **Average** Average all the values at that bin

	• **Deviation**	Standard deviation at that bin
	• **Maximum**	Maximum value at that bin
	• **Minimum**	Minimum value at that bin
	• **Oldest**	Oldest value at that bin by sensing time
	• **Latest**	Latest value at that bin by sensing time
Description	Resolution policy that shall be used when more than a single value falls within a given bin of the applicable grid.	

X-Path	/GMT_Configuration/Map/Product/Filters/Fill_Value
Type	Real
Occurrences	0 or 1 **Optional**
Units	Those of the selected parameter
Default value	*None*
Format	Any rational number in decimal form.
Description	In AUX_DGGRFI parameters, a special value (e.g. 0) is used to indicate the absence of a valid value. This configuration item is used to specify such a value and, as a consequence, any matching values which are encountered among the input data will be silently ignored.

5.33 ORIGINAL L-BAND GALAXY MAP

5.33.1 GENERAL INFORMATION

For correcting the Sky contribution to the reconstruction process, the emission line of the neutral interstellar hydrogen at 1420 MHz should be computed as auxiliary data, as it can reach values over 50 K. The effects can be predicted with a considerable accuracy by calculating the noise temperature arriving to each radiometer´s diagram pixel using available maps of the galactic emission at 1420 MHz.

The Galaxy Map here described is the original map generated by N. Floury. It is the reference to derive the L1 and L2 OS and SM galaxy radiation maps, obtained after applying a different weighting function to the original map. It is composed of the three following components:

- Hydrogen HI line: this strong emitting line at 1420.4058 MHz (+/- additional Doppler) is usually rejected by a band-stop filter in surveys of the continuum and must be reintroduced,
- Continuum (~1.4 GHz with a rejection of the HI line when required): combination of a variety of emission mechanisms (other lines, synchrotron, free-free, thermal, blended emission of discrete radio sources ….)
- Cosmic background (quasi constant value of 2.725 K)

The equatorial system of coordinates (right ascension, declination) is used here to define the domain covered by existing surveys. The reference system used here is B1950.

At present, only I Stoke component is computed (the other elements may be updated during the mission to reflect polarimetric measurements) and it is a sum of the following elements:

- Reich & Testori continuum
- Effelsberg survey for Cassiopeia region
- HI (K)

The precision of the map is set at 0.05 K.

5.33.2 TYPE AND SIZE

The following SMOS file types are addressed when referring to original L-Band galaxy map products, with their typical size indicated next to each entry:

- AUX_GALAXY 15.85 MB

5.33.3 FILENAME

The naming convention for original L-Band galaxy map auxiliary data products is described in detail in [AD. 1].

5.33.4 STRUCTURE

The structure of the original L-Band galaxy map auxiliary data products is elaborated in [AD. 1]. Please refer to this document as the main source for information regarding these files.

5.33.5 GMT CONFIGURATION

In addition to the general parameters which can be defined within a map entry, as part of a GMT configuration file, the following filters are applicable when plotting original L-Band galaxy map auxiliary data products:

- N/A

In particular, the details on these, along with the appropriate values for the product type, the parameter to be plotted, and the overlap resolution policy, are provided below:

X-Path	/GMT_Configuration/Map/Product/Type
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (AUX_GALAXY) are: • **AUX_GALAXY** Original L-Band galaxy map
Description	Type of the SMOS products to be plotted. If products of any other type are present in the input directory, they will be silently ignored by the GMT.

X-Path	/GMT_Configuration/Map/Product/Parameter
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (AUX_GALAXY) are: • **I** Total intensity (first Stokes parameter) • **Q** Phase difference (second Stokes parameter) • **U** Polarisation semi-major axis (third Stokes parameter) • **Error** Total error in the measurements
Description	Parameter whose data is to be plotted. Further details on their actual meaning, units and interpretation can be found in the respective product specifications ([AD. 1], [AD. 2]).

X-Path	/GMT_Configuration/Map/Product/Overlap
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	Average
Format	The valid values are: • **Average** Average all the values at that bin • **Deviation** Standard deviation at that bin • **Maximum** Maximum value at that bin • **Minimum** Minimum value at that bin • **Oldest** Oldest value at that bin by sensing time • **Latest** Latest value at that bin by sensing time
Description	Resolution policy that shall be used when more than a single value falls within a given bin of the applicable grid.

5.34 L1 L-BAND GALAXY MAP

5.34.1 GENERAL INFORMATION

The Galaxy Map AUX_GALNIR specified in this section is the actual one used by L1OP. It is based on the AUX_GALAXY map defined in the previous section, but the expected NIR Brightness Temperatures are obtained by convoluting the Galactic Map in the respective polarizations with the averaged NIR antenna radiation pattern. The antenna boresight is pointed in each of the grid coordinates directions, and the result of the integral is assigned to that coordinate. EADS CASA Espacio has computed an initial version of the values.

The RMS value is computed in a similar manner to the NIR BT, except that the Galactic Map is convoluted with a −3dB beam. The antenna boresight is pointed in each of the grid coordinates directions, and only the pixels within the 3dB cone around boresight are considered. Pixels are first filtered down to the resolution of the PLM, using an ISEA grid to achieve a constant resolution for the entire sphere. EADS CASA Espacio has also computed an initial version of the values.

5.34.2 TYPE AND SIZE

The following SMOS file types are addressed when referring to L1 L-Band galaxy map products, with their typical size indicated next to each entry:

- AUX_GALNIR 7.93 MB

5.34.3 FILENAME

The naming convention for L1 L-Band galaxy map auxiliary data products is described in detail in [AD. 1].

5.34.4 STRUCTURE

The structure of the L1 L-Band galaxy map auxiliary data products is elaborated in [AD. 1]. Please refer to this document as the main source for information regarding these files.

5.34.5 GMT CONFIGURATION

In addition to the general parameters which can be defined within a map entry, as part of a GMT configuration file, the following filters are applicable when plotting L1 L-Band galaxy map auxiliary data products:

- N/A

In particular, the details on these, along with the appropriate values for the product type, the parameter to be plotted, and the overlap resolution policy, are provided below:

X-Path	/GMT_Configuration/Map/Product/Type
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (AUX_GALNIR) are: • **AUX_GALNIR** L1 L-Band galaxy map
Description	Type of the SMOS products to be plotted. If products of any other type are present in the input directory, they will be silently ignored by the GMT.

X-Path	/GMT_Configuration/Map/Product/Parameter
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (AUX_GALNIR) are: • **Expected_NIR_BT** Average NIR polarisation BT expected from instrument • **RMS** Flatness of the Galaxy map, given as the RMS at -3dB
Description	Parameter whose data is to be plotted. Further details on their actual meaning, units and interpretation can be found in the respective product specifications ([AD. 1], [AD. 2]).

X-Path	/GMT_Configuration/Map/Product/Overlap
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	Average
Format	The valid values are: • **Average** Average all the values at that bin • **Deviation** Standard deviation at that bin • **Maximum** Maximum value at that bin • **Minimum** Minimum value at that bin • **Oldest** Oldest value at that bin by sensing time • **Latest** Latest value at that bin by sensing time
Description	Resolution policy that shall be used when more than a single value falls within a given bin of the applicable grid.

5.35 FARADAY ROTATION PRODUCTS

5.35.1 GENERAL INFORMATION

The AUX_FARA_X Auxiliary Data Products provide the L2OP with a more precise computation of the Faraday angle based on algorithm improvements and refined VTEC background field (i.e. the combined VTEC). In addition the Faraday rotation auxiliary file can be used in any of the DPGS sub/system, and allows de-coupling L1 reprocessing activity for algorithm upgrades and availability of a more precise Faraday rotation (i.e. VTEC combined, usage of refined geomagnetic model).

Operationally the Faraday processor is triggered by the availability of the TLM_MIRA1A and the overlapping VTEC map (see section 5.22). The outcome of the processing is an AUX_FARA_X ADF, where the X is determined by the AUX_VTEC_X used as input. As such, it can be generated from predicted VTEC data (P), rapid analysis data (R) or consolidated analysis data (C).

The Faraday rotation products contain data in all the DGG grid points of the SMOS L1C swath, without distinguishing between land and ocean areas. The swath is determined reusing the same approach as L1C Processor, therefore it is expected that all L1C product grid points have their match in the AUX_FARA_X ADFs.

5.35.2 TYPE AND SIZE

The following SMOS file types are addressed when referring to Faraday rotation products, with their typical size indicated next to each entry:

- AUX_FARA_C 415,2 MB
- AUX_FARA_P 415,2 MB
- AUX_FARA_R 415,2 MB

5.35.3 FILENAME

The naming convention for Faraday rotation products is described in detail in [AD. 1].

5.35.4 STRUCTURE

The structure of the Faraday rotation products is elaborated in [AD. 1]. Please refer to this document as the main source for information regarding these files.

5.35.5 GMT CONFIGURATION

In addition to the general parameters which can be defined within a map entry, as part of a GMT configuration file, the following filters are applicable when plotting Faraday rotation products:

- Target Target incidence angle
- Minimum Minimum incidence angle
- Maximum Maximum incidence angle

In addition the following flag is applicable when plotting L1C Dual Polarization products:

- Average Flag to select whether values are averaged within a product

In particular, the details on these, along with the appropriate values for the product type, the parameter to be plotted, and the overlap resolution policy, are provided below:

X-Path	/GMT_Configuration/Map/Product/Type

Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (AUX_FARA_X) are: • **AUX_FARA_X** Faraday rotation product
Description	Type of the SMOS products to be plotted. If products of any other type are present in the input directory, they will be silently ignored by the GMT.

X-Path	/GMT_Configuration/Map/Product/Parameter
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (AUX_FARA_X) are: • **Grid_Point_ID** Unique identifier for the grid point • **Grid_Point_Latitude** Latitude of the DGG cell's center • **Grid_Point_Longitude** Longitude of the DGG cell's center • **Grid_Point_Altitude** Altitude of the DGG cell's center • **Faraday_Data_Counter** Counter of Faraday rotation values for the current point • **Snapshot_ID_of_Pixel** Unique identifier for the snapshot • **Faraday_Rotation_Angle** Faraday rotation angle • **Faraday_Rotation_Angle_Specular_Ray** Faraday rotation angle along specular direction • **Incidence_Angle** Incidence angle • **VTEC** Vertical Total Electron Content • **VTEC_Specular_Ray** Vertical Total Electron Content along specular direction • **Software_Error_Flag** Whether software errors were detected when processing • **ADF_Error_Flag** Whether ADF errors were detected when processing
Description	Parameter whose data is to be plotted. Further details on their actual meaning, units and interpretation can be found in the respective product specifications ([AD. 1], [AD. 2]).

X-Path	/GMT_Configuration/Map/Product/Overlap
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	Average
Format	The valid values are: • **Average** Average all the values at that bin • **Deviation** Standard deviation at that bin • **Maximum** Maximum value at that bin

	• **Minimum** Minimum value at that bin • **Oldest** Oldest value at that bin by sensing time • **Latest** Latest value at that bin by sensing time • **Nearest** The nearest measurement with respect to the target angle
Description	Resolution policy that shall be used when the input products, or filtering of the input products, provide multiple values which fall within a given bin of the applicable grid.

X-Path	/GMT_Configuration/Map/Product/Filters/Incidence_Angle/Target
Type	Real
Occurrences	0 or 1 **Optional**
Units	Degrees
Default value	42.5
Format	Any rational number in the range [0.0, 90.0].
Description	Target incidence angle for the filtering of the input data. Whenever multiple data for a pixel is found, which falls within the range defined for the incidence angle, the one closest to this target value will be selected if the Incidence_Angle/Average = 0 option is selected or not specified. Any other value is silently discarded. If data is returned from multiple input products, the Overlap option then defines the policy which is applied to these values. If Incidence_Angle/Average= = 1 is selected, the target is ignored.

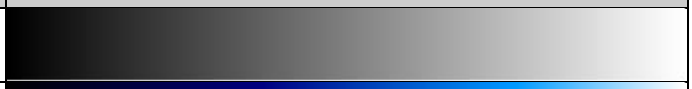
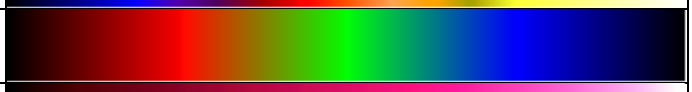
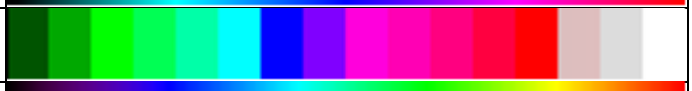
X-Path	/GMT_Configuration/Map/Product/Filters/Incidence_Angle/Minimum
Type	Real
Occurrences	0 or 1 **Optional**
Units	Degrees
Default value	0.0
Format	Any rational number in the range [0.0, 90.0].
Description	Minimum incidence angle for the filtering of the input data. Whenever multiple data for a pixel is found, its incidence angle must be equal or greater than this in order to be considered for further processing. Any other value is silently discarded.

X-Path	/GMT_Configuration/Map/Product/Filters/Incidence_Angle/Maximum
Type	Real
Occurrences	0 or 1 **Optional**
Units	Degrees
Default value	90.0
Format	Any rational number in the range [0.0, 90.0].
Description	Maximum incidence angle for the filtering of the input data. Whenever multiple data for a pixel is found, its incidence angle must be equal or smaller than this in order to be considered for further processing. Any other value is silently discarded.

X-Path	/GMT_Configuration/Map/Product/Filters/Incidence_Angle/Average
Type	String
Occurrences	0 or 1 **Optional**
Units	N/A

Default value	0
Format	The valid values are: • **0** Use the nearest measurement with respect to the target angle. • **1** Average the values of the data within the specified incidence angle range.
Description	When Average = 1, the data within the incidence angle range defined by Maximum and Minimum is averaged for each input product. When Average = 0, the value nearest to the target is selected for each input product. If data is returned from multiple input products, the Overlap option then defines the policy which is applied to these values.

ANNEX A: IDL COLOR TABLES

Identifier	Description	Palette
0	B-W LINEAR	
1	BLUE/WHITE	
2	GRN-RED-BLU-WHT	
3	RED TEMPERATURE	
4	BLUE/GREEN/RED/YELLOW	
5	STD GAMMA-II	
6	PRISM	
7	RED-PURPLE	
8	GREEN/WHITE LINEAR	
9	GRN/WHT EXPONENTIAL	
10	GREEN-PINK	
11	BLUE-RED	
12	16 LEVEL	
13	RAINBOW	
14	STEPS	
15	STERN SPECIAL	
16	Haze	
17	Blue - Pastel – Red	
18	Pastels	
19	Hue Sat Lightness 1	
20	Hue Sat Lightness 2	

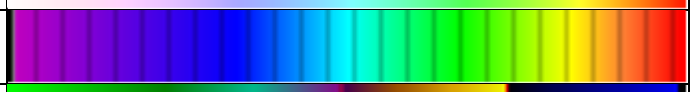
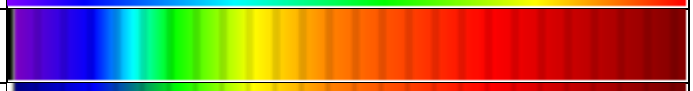
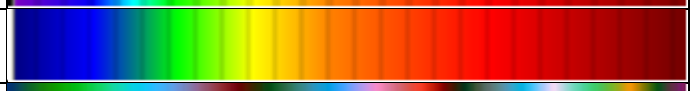
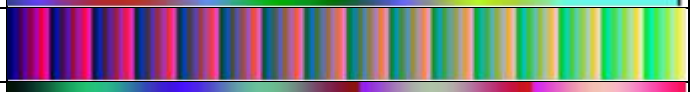
21	Hue Sat Value 1	
22	Hue Sat Value 2	
23	Purple-Red + Stripes	
24	Beach	
25	Mac Style	
26	Eos A	
27	Eos B	
28	Hardcandy	
29	Nature	
30	Ocean	
31	Peppermint	
32	Plasma	
33	Blue-Red	
34 (Default)	Rainbow	
35	Blue Waves	
36	Volcano	
37	Waves	
38	Rainbow18	
39	Rainbow + white	
40	Rainbow + black	

Table A-1: IDL color tables

ANNEX B: SMOS L2 OCEAN SALINITY USER DATA PRODUCTS (MIR_OSUDP2) PRIOR V660 FORMAT VALID PARAMETERS

The products of the type MIR_OSUDP2 suffered a major format change in version 660. Below are presented the valid parameters and filters used before V660 format change.

X-Path	/GMT_Configuration/Map/Product/Parameter
Type	String
Occurrences	1 **Required**
Units	N/A
Default value	N/A
Format	The valid values for this type of product (MIR_OSUDP2) are: • **Grid_Point_ID** Unique identifier for the grid point • **Latitude** Latitude of the DGG cell's center • **Longitude** Longitude of the DGG cell's center • **Equiv_ftprt_Diam** Equivalent footprint diameter • **Mean_acq_time** Mean time of acquisition for all valid TB • **SSS1** Sea surface salinity using roughness model 1 • **Sigma_SSS1** Theoretical uncertainty computed for SSS1 • **SSS2** Sea surface salinity using roughness model 2 • **Sigma_SSS2** Theoretical uncertainty computed for SSS2 • **SSS3** Sea surface salinity using roughness model 3 • **Sigma_SSS3** Theoretical uncertainty computed for SSS3 • **A_card** Effective Acard • **Sigma_Acard** Theoretical uncertainty computed for Acard • **WS** Equivalent neutral wind speed from ECMWF • **Sigma_WS**[19] Theoretical uncertainty associated with WS • **SST** Sea surface temperature from ECMWF • **Sigma_SST**Error! Bookmark not defined. Theoretical uncertainty associated with SST • **Tb_42.5H** Brightness temp. at surface level (H pol.) • **Sigma_Tb_42.5H** Theoretical uncertainty of Tb_42.5H • **Tb_42.5V** Brightness temp. at surface level (V pol.) • **Sigma_Tb_42.5V** Theoretical uncertainty of Tb_42.5V • **Tb_42.5X** Brightness temp. at antenna level (X pol.) • **Sigma_Tb_42.5X** Theoretical uncertainty of Tb_42.5X • **Tb_42.5Y** Brightness temp. at antenna level (Y pol.) • **Sigma_Tb_42.5Y** Theoretical uncertainty of Tb_42.5Y • **Dg_chi2_1** Retrieval fit quality index (forward model 1) • **Dg_chi2_2** Retrieval fit quality index (forward model 2)

[19] Parameter is only possible to be displayed for products generated with schema version 300.

	• **Dg_chi2_3** Retrieval fit quality index (forward model 3) • **Dg_chi2_Acard** Retrieval fit quality index (cardioid model) • **Dg_chi2_P_1** Chi2 high value acceptability probability • **Dg_chi2_P_2** Chi2 high value acceptability probability • **Dg_chi2_P_3** Chi2 high value acceptability probability • **Dg_chi2_P_Acard** Chi2 high value acceptability probability • **Dg_quality_SSS1** Quality index for SSS1 • **Dg_quality_SSS2** Quality index for SSS2 • **Dg_quality_SSS3** Quality index for SSS3 • **Dg_quality_Acard** Quality index for Acard • **Dg_num_iter_1** Number of iterations (forward model 1) • **Dg_num_iter_2** Number of iterations (forward model 2) • **Dg_num_iter_3** Number of iterations (forward model 3) • **Dg_num_iter_4** Number of iterations (cardioid model) • **Dg_num_meas_l1C** Number of measurements in L1C product • **Dg_num_meas_valid** Number of valid measurements for SSS retr. • **Dg_border_fov** Valid measurements with BORDER_FOV • **Dg_eaf_fov** Valid measurements with EAF_FOV • **Dg_af_fov** Valid measurements with AF_FOV • **Dg_sun_tails** Number of measurements with SUN_TAILS • **Dg_sun_glint_area** Number of measurements with SUN_GLINT… • **Dg_sun_glint_fov** Number of measurements with SUN_GLINT… • **Dg_sun_fov** Number of measurements with SUN_FOV • **Dg_sun_glint_L2** Number of measurements with L2 sunglint • **Dg_Suspect_ice** Number of suspected ice contaminated m… • **Dg_galactic_Noise_Error** Number of discarded measurements • **Dg_galactic_Noise_Pol**[20] Number of measurements with Fm_gal_noise_pol on • **Dg_moonglint** Number of measurements with L2 moonglint • **Dg_sky** Measurements towards a strong source • **Fg_ctrl_sel_gp_1**[21] Grid point selected according to land sea mask • **Fg_ctrl_sel_gp_2** Grid point selected according to land sea mask • **Fg_ctrl_sel_gp_3** Grid point selected according to land sea mask • **Fg_ctrl_sel_gp_4** Grid point selected according to land sea mask • **Fg_ctrl_range_1** Values outside range using forward model 1 • **Fg_ctrl_range_2** Values outside range using forward model 2 • **Fg_ctrl_range_3** Values outside range using forward model 3 • **Fg_ctrl_range_4** Values outside range using cardioid model

[20] Parameter is only possible to be displayed for products generated with schema version 300.

[21] OSUDP2 products contain four blocks of control and science flags, one for each model defined. Given that the names of the flags within each of these is similar, a subscript is appended to each identifier to differentiate the particular model the flag refers to: _1 (forward model 1), _2 (forward model 2), _3 (forward model 3), _4 (cardioid model)

	• **Fg_ctrl_sigma_1**	High retrieval sigma using forward model 1
	• **Fg_ctrl_sigma_2**	High retrieval sigma using forward model 2
	• **Fg_ctrl_sigma_3**	High retrieval sigma using forward model 3
	• **Fg_ctrl_sigma_4**	High retrieval sigma using cardioid model
	• **Fg_ctrl_chi2_1**	Poor fit quality using forward model 1
	• **Fg_ctrl_chi2_2**	Poor fit quality using forward model 2
	• **Fg_ctrl_chi2_3**	Poor fit quality using forward model 3
	• **Fg_ctrl_chi2_4**	Poor fit quality using cardioid model
	• **Fg_ctrl_chi2_P_1**	Poor fit quality using forward model 1
	• **Fg_ctrl_chi2_P_2**	Poor fit quality using forward model 2
	• **Fg_ctrl_chi2_P_3**	Poor fit quality using forward model 3
	• **Fg_ctrl_chi2_P_4**	Poor fit quality using cardioid model
	• **Fg_ctrl_quality_SSS_1**	Critical flag raised during SSS retrieval
	• **Fg_ctrl_quality_SSS_2**	Critical flag raised during SSS retrieval
	• **Fg_ctrl_quality_SSS_3**	Critical flag raised during SSS retrieval
	• **Fg_ctrl_quality_SSS_4**	Critical flag raised during SSS retrieval
	• **Fg_ctrl_sunglint_1**	High number of values flagged for sunglint
	• **Fg_ctrl_sunglint_2**	High number of values flagged for sunglint
	• **Fg_ctrl_sunglint_3**	High number of values flagged for sunglint
	• **Fg_ctrl_sunglint_4**	High number of values flagged for sunglint
	• **Fg_ctrl_moonglint_1**	High number of values flagged for moonglint
	• **Fg_ctrl_moonglint_2**	High number of values flagged for moonglint
	• **Fg_ctrl_moonglint_3**	High number of values flagged for moonglint
	• **Fg_ctrl_moonglint_4**	High number of values flagged for moonglint
	• **Fg_ctrl_gal_noise_1**	High number of values flagged for gal. noise
	• **Fg_ctrl_gal_noise_2**	High number of values flagged for gal. noise
	• **Fg_ctrl_gal_noise_3**	High number of values flagged for gal. noise
	• **Fg_ctrl_gal_noise_4**	High number of values flagged for gal. noise
	• **Fg_ctrl_gal_noise_pol_1**	High number of values flagged for polarized gal. noise
	• **Fg_ctrl_gal_noise_pol_2**	High number of values flagged for polarized gal. noise
	• **Fg_ctrl_gal_noise_pol_3**	High number of values flagged for polarized gal. noise
	• **Fg_ctrl_gal_noise_pol_4**	High number of values flagged for polarized gal. noise
	• **Fg_ctrl_reach_maxiter_1**	Maximum number of iterations reached
	• **Fg_ctrl_reach_maxiter_2**	Maximum number of iterations reached
	• **Fg_ctrl_reach_maxiter_3**	Maximum number of iterations reached
	• **Fg_ctrl_reach_maxiter_4**	Maximum number of iterations reached
	• **Fg_ctrl_num_meas_min_1**	Not processed due to too few valid meas.
	• **Fg_ctrl_num_meas_min_2**	Not processed due to too few valid meas.
	• **Fg_ctrl_num_meas_min_3**	Not processed due to too few valid meas.
	• **Fg_ctrl_num_meas_min_4**	Not processed due to too few valid meas.
	• **Fg_ctrl_num_meas_low_1**	Number of valid measurements is low

	• **Fg_ctrl_num_meas_low_2**	Number of valid measurements is low
	• **Fg_ctrl_num_meas_low_3**	Number of valid measurements is low
	• **Fg_ctrl_num_meas_low_4**	Number of valid measurements is low
	• **Fg_ctrl_many_outliers_1**	Number of outliers too high
	• **Fg_ctrl_many_outliers_2**	Number of outliers too high
	• **Fg_ctrl_many_outliers_3**	Number of outliers too high
	• **Fg_ctrl_many_outliers_4**	Number of outliers too high
	• **Fg_ctrl_marq_1**	Marquardt increment is greater than lambda
	• **Fg_ctrl_marq_2**	Marquardt increment is greater than lambda
	• **Fg_ctrl_marq_3**	Marquardt increment is greater than lambda
	• **Fg_ctrl_marq_4**	Marquardt increment is greater than lambda
	• **Fg_ctrl_roughness_1**	Roughness correction applied
	• **Fg_ctrl_roughness_2**	Roughness correction applied
	• **Fg_ctrl_roughness_3**	Roughness correction applied
	• **Fg_ctrl_roughness_4**	Roughness correction applied
	• **Fg_ctrl_foam_1**	Low wind speed and zero foam contribution
	• **Fg_ctrl_foam_2**	Low wind speed and zero foam contribution
	• **Fg_ctrl_foam_3**	Low wind speed and zero foam contribution
	• **Fg_ctrl_foam_4**	Low wind speed and zero foam contribution
	• **Fg_ctrl_ecmwf_1**	One or more ECMWF data is missing
	• **Fg_ctrl_ecmwf_2**	One or more ECMWF data is missing
	• **Fg_ctrl_ecmwf_3**	One or more ECMWF data is missing
	• **Fg_ctrl_ecmwf_4**	One or more ECMWF data is missing
	• **Fg_ctrl_valid_1**	Grid points pass measurement discrimination tests
	• **Fg_ctrl_valid_2**	Grid points pass measurement discrimination tests
	• **Fg_ctrl_valid_3**	Grid points pass measurement discrimination tests
	• **Fg_ctrl_valid_4**	Grid points pass measurement discrimination tests
	• **Fg_ctrl_no_surface_1**	The 42.5º angle is not included in the dwell line
	• **Fg_ctrl_no_surface_2**	The 42.5º angle is not included in the dwell line
	• **Fg_ctrl_no_surface_3**	The 42.5º angle is not included in the dwell line
	• **Fg_ctrl_no_surface_4**	The 42.5º angle is not included in the dwell line
	• **Fg_ctrl_range_Acard_1**	Retrieved Acard is outside range
	• **Fg_ctrl_range_Acard_2**	Retrieved Acard is outside range
	• **Fg_ctrl_range_Acard_3**	Retrieved Acard is outside range
	• **Fg_ctrl_range_Acard_4**	Retrieved Acard is outside range
	• **Fg_ctrl_sigma_Acard_1**	Retrieved Acard sigma is too high
	• **Fg_ctrl_sigma_Acard_2**	Retrieved Acard sigma is too high
	• **Fg_ctrl_sigma_Acard_3**	Retrieved Acard sigma is too high
	• **Fg_ctrl_sigma_Acard_4**	Retrieved Acard sigma is too high
	• **Fg_ctrl_quality_Acard_1**	A critical flag was raised during Acard retrieval
	• **Fg_ctrl_quality_Acard_2**	A critical flag was raised during Acard retrieval

	• **Fg_ctrl_quality_Acard_3** A critical flag was raised during Acard retrieval • **Fg_ctrl_quality_Acard_4** A critical flag was raised during Acard retrieval • **Fg_ctrl_used_faraTEC_1** TEC for this grid point was obtained from AUX_FARA_x • **Fg_ctrl_used_faraTEC_2** TEC for this grid point was obtained from AUX_FARA_x • **Fg_ctrl_used_faraTEC_3** TEC for this grid point was obtained from AUX_FARA_x • **Fg_ctrl_used_faraTEC_4** TEC for this grid point was obtained from AUX_FARA_x • **Fg_ctrl_poor_geophysical_**1 Flag set if the grid point probably has poor quality SSS1 due to geophysical problems or Fg_ctrl_valid_1==false • **Fg_ctrl_poor_geophysical_**2 Flag set if the grid point probably has poor quality SSS2 due to geophysical problems or Fg_ctrl_valid_2==false**Fg_ctrl_poor_geophysical_**3 Flag set if the grid point probably has poor quality SSS3 due to geophysical problems or Fg_ctrl_valid_3==false • **Fg_ctrl_poor_geophysical_**4 Flag set if the grid point probably has poor quality SSS4 due to geophysical problems or Fg_ctrl_valid_4==false • **Fg_ctrl_poor_retrieval_1** Flag set if the grid point has poor SSS1 due to retrieval failure, poor quality convergence or Fg_ctrl_valid_1==false • **Fg_ctrl_poor_retrieval_2** Flag set if the grid point has poor SSS2 due to retrieval failure, poor quality convergence or Fg_ctrl_valid_2==false • **Fg_ctrl_poor_retrieval_3** Flag set if the grid point has poor SSS3 due to retrieval failure, poor quality convergence or Fg_ctrl_valid_3==false • **Fg_ctrl_poor_retrieval_4** Flag set if the grid point has poor SSS4 due to retrieval failure, poor quality convergence or Fg_ctrl_valid_4==false • **Fg_ctrl_suspect_rfi_1** Grid point is suspected of being contaminated by RFI • **Fg_ctrl_suspect_rfi_2** Grid point is suspected of being contaminated by RFI • **Fg_ctrl_suspect_rfi_3** Grid point is suspected of being contaminated by RFI • **Fg_ctrl_suspect_rfi_4** Grid point is suspected of being contaminated by RFI • **Fg_ctrl_retriev_fail_1** Flag raised if iterative scheme returns an error • **Fg_ctrl_retriev_fail_2** Flag raised if iterative scheme returns an error • **Fg_ctrl_retriev_fail_3** Flag raised if iterative scheme returns an error • **Fg_ctrl_retriev_fail_4** Flag raised if iterative scheme returns an error • **Fg_sc_land_sea_coast1_1** Land flag (filtered grid points) • **Fg_sc_land_sea_coast1_2** Land flag (filtered grid points) • **Fg_sc_land_sea_coast1_3** Land flag (filtered grid points) • **Fg_sc_land_sea_coast1_4** Land flag (filtered grid points) • **Fg_sc_land_sea_coast2_1** Land flag (filtered grid points) • **Fg_sc_land_sea_coast2_2** Land flag (filtered grid points) • **Fg_sc_land_sea_coast2_3** Land flag (filtered grid points) • **Fg_sc_land_sea_coast2_4** Land flag (filtered grid points) • **Fg_sc_TEC_gradient_1** High TEC gradient along dwell for a grid point • **Fg_sc_TEC_gradient_2** High TEC gradient along dwell for a grid point • **Fg_sc_TEC_gradient_3** High TEC gradient along dwell for a grid point • **Fg_sc_TEC_gradient_4** High TEC gradient along dwell for a grid point • **Fg_sc_in_clim_ice_1** Grid point with maximum extent of sea ice • **Fg_sc_in_clim_ice_2** Grid point with maximum extent of sea ice • **Fg_sc_in_clim_ice_3** Grid point with maximum extent of sea ice

	• **Fg_sc_in_clim_ice_4**	Grid point with maximum extent of sea ice
	• **Fg_sc_ice_1**	ECMWF gives high ice concentration
	• **Fg_sc_ice_2**	ECMWF gives high ice concentration
	• **Fg_sc_ice_3**	ECMWF gives high ice concentration
	• **Fg_sc_ice_4**	ECMWF gives high ice concentration
	• **Fg_sc_suspect_ice_1**	High ice concentration suspected
	• **Fg_sc_suspect_ice_2**	High ice concentration suspected
	• **Fg_sc_suspect_ice_3**	High ice concentration suspected
	• **Fg_sc_suspect_ice_4**	High ice concentration suspected
	• **Fg_sc_rain_1**	Rain rate is above the threshold
	• **Fg_sc_rain_2**	Rain rate is above the threshold
	• **Fg_sc_rain_3**	Rain rate is above the threshold
	• **Fg_sc_rain_4**	Rain rate is above the threshold
	• **Fg_sc_high_wind_1**	High or low wind condition
	• **Fg_sc_high_wind_2**	High or low wind condition
	• **Fg_sc_high_wind_3**	High or low wind condition
	• **Fg_sc_high_wind_4**	High or low wind condition
	• **Fg_sc_low_wind_1**	Low wind condition
	• **Fg_sc_low_wind_2**	Low wind condition
	• **Fg_sc_low_wind_3**	Low wind condition
	• **Fg_sc_low_wind_4**	Low wind condition
	• **Fg_sc_high_SST_1**	High or low SST condition
	• **Fg_sc_high_SST_2**	High or low SST condition
	• **Fg_sc_high_SST_3**	High or low SST condition
	• **Fg_sc_high_SST_4**	High or low SST condition
	• **Fg_sc_low_SST_1**	Low SST condition
	• **Fg_sc_low_SST_2**	Low SST condition
	• **Fg_sc_low_SST_3**	Low SST condition
	• **Fg_sc_low_SST_4**	Low SST condition
	• **Fg_sc_high_SSS_1**	High or low SSS condition
	• **Fg_sc_high_SSS_2**	High or low SSS condition
	• **Fg_sc_high_SSS_3**	High or low SSS condition
	• **Fg_sc_high_SSS_4**	High or low SSS condition
	• **Fg_sc_low_SSS_1**	Low SSS condition
	• **Fg_sc_low_SSS_2**	Low SSS condition
	• **Fg_sc_low_SSS_3**	Low SSS condition
	• **Fg_sc_low_SSS_4**	Low SSS condition
	• **Fg_sc_sea_state_1_1**	Sea state class 1
	• **Fg_sc_sea_state_1_2**	Sea state class 1
	• **Fg_sc_sea_state_1_3**	Sea state class 1
	• **Fg_sc_sea_state_1_4**	Sea state class 1

	• **Fg_sc_sea_state_2_1** Sea state class 2 • **Fg_sc_sea_state_2_2** Sea state class 2 • **Fg_sc_sea_state_2_3** Sea state class 2 • **Fg_sc_sea_state_2_4** Sea state class 2 • **Fg_sc_sea_state_3_1** Sea state class 3 • **Fg_sc_sea_state_3_2** Sea state class 3 • **Fg_sc_sea_state_3_3** Sea state class 3 • **Fg_sc_sea_state_3_4** Sea state class 3 • **Fg_sc_sea_state_4_1** Sea state class 4 • **Fg_sc_sea_state_4_2** Sea state class 4 • **Fg_sc_sea_state_4_3** Sea state class 4 • **Fg_sc_sea_state_4_4** Sea state class 4 • **Fg_sc_sea_state_5_1** Sea state class 5 • **Fg_sc_sea_state_5_2** Sea state class 5 • **Fg_sc_sea_state_5_3** Sea state class 5 • **Fg_sc_sea_state_5_4** Sea state class 5 • **Fg_sc_sea_state_6_1** Sea state class 6 • **Fg_sc_sea_state_6_2** Sea state class 6 • **Fg_sc_sea_state_6_3** Sea state class 6 • **Fg_sc_sea_state_6_4** Sea state class 6 • **Fg_sc_sst_front_1** Presence of a temperature front • **Fg_sc_sst_front_2** Presence of a temperature front • **Fg_sc_sst_front_3** Presence of a temperature front • **Fg_sc_sst_front_4** Presence of a temperature front • **Fg_sc_sss_front_1** Presence of a salinity front • **Fg_sc_sss_front_2** Presence of a salinity front • **Fg_sc_sss_front_3** Presence of a salinity front • **Fg_sc_sss_front_4** Presence of a salinity front • **Fg_sc_ice_Acard_1** Ice flag from cardioid • **Fg_sc_ice_Acard_2** Ice flag from cardioid • **Fg_sc_ice_Acard_3** Ice flag from cardioid • **Fg_sc_ice_Acard_4** Ice flag from cardioid • **ST1_S** First stokes param at surface level • **PI_S** Polarization index at surface level • **ST1_ToA** First stokes parameter at top of atmosphere • **PI_ToA** Polarization index at top of atmosphere • **Dg_RFI_L1** Number of measurements suspected by L1 as being contaminated by RFI • **Dg_RFI_X** Number of measurements suspected of being contaminated by RFI in X polarization **Dg_RFI_Y** Number of measurements suspected of being contaminated by RFI in Y polarization

Description	Parameter whose data is to be plotted. Further details on their actual meaning, units and interpretation can be found in the respective product specifications ([AD. 1], [AD. 2]).

X-Path	/GMT_Configuration/Map/Product/Filters/Filter_A_OS
Type	Int
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	*0*
Format	The valid values are: • 0 The filter is not applied • 1 The filter is applied by checking the FG_CTRL_POOR_RETRIEVAL_1 flag • 2 The filter is applied by checking the FG_CTRL_POOR_RETRIEVAL_2 flag • 3 The filter is applied by checking the FG_CTRL_POOR_RETRIEVAL_3 flag • 4 The filter is applied by checking the FG_CTRL_POOR_RETRIEVAL_4 flag
Description	The Filter_A_OS shall extract successful retrievals: reject if FG_CTRL_POOR_RETRIEVAL_X = 1, where X = 1,2,3 or 4. The filter is applicable to map the following parameters: • SSSx, • Sigma_SSSx, • Tb_42.5w, • Sigma_Tb_42.5w where x=1,2,3 and w=X,Y,H,V.

X-Path	/GMT_Configuration/Map/Product/Filters/Filter_B_OS
Type	Int
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	*0*
Format	The valid values are: • 0 The filter is not applied • 1 The filter is applied by checking the FG_CTRL_POOR_RETRIEVAL_1 and FG_CTRL_POOR_GEOPHYSICAL_1 flags • 2 The filter is applied by checking the FG_CTRL_POOR_RETRIEVAL_2 and FG_CTRL_POOR_GEOPHYSICAL_2 flags • 3 The filter is applied by checking the FG_CTRL_POOR_RETRIEVAL_3 and FG_CTRL_POOR_GEOPHYSICAL_3 flag • 4 The filter is applied by checking the FG_CTRL_POOR_RETRIEVAL_4 and FG_CTRL_POOR_GEOPHYSICAL_4 flag
Description	The Filter_B_OS shall extract good retrievals: reject if FG_CTRL_POOR_RETRIEVAL_X = 1 or FG_CTRL_POOR_GEOPHYSICAL_X = 1, where X = 1,2,3 or 4. The filter is applicable to map the following parameters: • SSSx,

	• Sigma_SSSx, • Tb_42.5w, • Sigma_Tb_42.5w where x=1,2,3 and w=X,Y,H,V.

X-Path	/GMT_Configuration/Map/Product/Filters/Filter_C_OS/Filter_Option
Type	Int
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	*0*
Format	The valid values are: • 0 The filter is not applied • 1 The filter is applied by checking the DG_QUALITY_SSS1 flag • 2 The filter is applied by checking the DG_QUALITY_SSS2 flag • 3 The filter is applied by checking the DG_QUALITY_SSS3 flag
Description	The Filter_C_OS shall extract the retrievals by quality index: reject if DG_QUALITY_SSSX > defined threshold, where X = 1, 2 or 3 The filter is applicable to map the following parameters: • SSSx, • Sigma_SSSx, • Tb_42.5w, • Sigma_Tb_42.5w where x=1,2,3 and w=X,Y,H,V.

X-Path	/GMT_Configuration/Map/Product/Filters/Filter_C_OS/Quality_Threshold
Type	Real
Occurrences	0 or 1 **Optional**
Units	N/A
Default value	*150*
Format	Any rational number in decimal form
Description	The Quality_Threshold option is used to define the threshold value used by the Filter_C_OS.