



PREPARATION AND OPERATIONS OF THE MISSION PERFORMANCE CENTRE
(MPC) FOR THE COPERNICUS SENTINEL-3 MISSION

Product Data Format Specification - SRAL and MWR
Level 1 products



Ref.: S3IPF.PDS.003.1

Issue: 2.11

Date: 18 April 2018

Contract: 4000111836/14/I-LG



esa



EUMETSAT

Customer: ESA	Document Ref.: S3IPF.PDS.003.1
Contract No.: 4000111836/14/I-LG	Date: 18 April 2018
	Issue: 2.11

Project:	PREPARATION AND OPERATIONS OF THE MISSION PERFORMANCE CENTRE (MPC) FOR THE COPERNICUS SENTINEL-3 MISSION		
Title:	Product Data Format Specification - SRAL and MWR Level 1 products		
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Distribution:	ESA and EUMETSAT		
Filename	S3IPF PDS 003.1 - i2r11 - Product Data Format Specification - SRAL and MWR Level 1.docx		

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AMENDMENT POLICY

This document shall be amended by releasing a new edition of the document in its entirety. The Amendment Record Sheet below records the history and issue status of this document.

Amendment Record Sheet

ISSUE	DATE	REASON
1.0	01 Oct 2012	DR1 data-package release
1.1	18 Dec 2012	DR1 update data-package and adding Level 2 part for DR2 data package
1.3	19 June 2013	Change of template DR2 update data-package
1.4	10 July 2013	Update following V1 FAT
1.5	24 Mar 2014	RIDs and SPRs correction update
1.6	17 April 2014	Typo correction
1.7	17 June 2014	Typo correction
1.8	25 November 2014	Product size correction Update for MWR V3 GPP
1.9	10 February 2015	Reference update
1.10	30 June 2015	Updates linked to Minor change CCN-3
1.11	10 July 2015	Take into account RIDs on version 1.10
2.0	26/10/2015	Update for the generation of the new L1A and L1B-S products
2.1	25/02/2016	Corrections on L1A and L1B-S products
2.2	15/04/2016	Corrections following L1A/L1BS TRR
2.3	20/06/2016	L1A SRAL Product size reduction

ISSUE	DATE	REASON
2.4	30/09/2016	Update SR-1 product map
2.5	24/01/2017	Update SR-1 product map, following quantization of L1BS stack power
2.6	09/06/2017	MWR : Update along-track averaging flag, description of MWR LTM MON , update related to new calibration timeline Update SR1 CAL product format Update SR-1 SRAL product format Update SR-2 product format
2.7	13/07/2017	Minor update of SR1 CAL, SR-1 SRAL and SR-2 product format
2.8	01/09/2017	Correction of units attributes for UTC_sec fields of MWR L1B products (MWR and CAL)
2.9	09/10/2017	Documentation split into: L1, L2 land and L2 marine volumes
2.10	28/02/2018	Add "acquisition.nc" acquisition info specification
2.11	18/04/2018	Correction for SR_1_SRA manifest: ID must be unique Change unit to dB/Hz for GPRW slopes

Document Change Record

No.	Change in Issue	Description	Affected Section
1	1.1	Correction of the unit for "sral_fine_time_l1b" variable	0, 4.2.1.4.2, 4.2.1.4.3, 6.1.1.4.1, 6.1.1.4.2, 6.1.1.4.3, 6.1.1.4.4, 6.1.1.4.5
2	1.1	Typo: "Commens" changed to "Comments"	4.2.1.4.2, 6.1.1.4.2, 6.1.1.4.5
3	1.1	Name of the parameters missing in front of the "add_offset" line	6.1.1.4.3
4	1.1	DR2 Data Package: SRAL/MWR L2 product format	4 and 5
5	1.1	S3IPF-340, S3IPF-521: Adding of the definition of the MWR L1b CAL product	6.1.3
6	1.1	S3IPF-367: Adding of the size of the CAL products	6

No.	Change in Issue	Description	Affected Section
7	1.1	S3IPF-455: Correction of the attributes of the Loss of Track criterion	0, 4.2.1.4.2, 4.2.1.4.3
8	1.1	S3IPF-480: Correction of the title of the section	8
9	1.1	S3IPF-484: Correction of the reference to the MWR L1b secondary metadata	1.1
10	1.1	S3IPF-493: Correction of the size of the SRAL L1b product	9
11	1.1	S3IPF-504: Removal of the acronyms list and reference to the Product Structure Volume	1.4
12	1.1	S3IPF-505: Further information about the calibration and monitoring modes of the MWR instrument	2.2
13	1.1	S3IPF-507: Removal of the information of the availability of the product to the end-users	3.1
14	1.1	S3IPF-510: Product Specification of SRAL/MWR L1 and L2 provided in different documents	-
15	1.1	S3IPF-515: Correction of typo in a label of table 4-1	Table 4-1
16	1.2	Change of document template.	Entire document
17	1.2	S3IPF-833: Adding of the MWR CAL L1b product in the MWR product tree	3.2
18	1.2	S3IPF-993: Adding of the missing references	3.3 4.1.1
19	1.2	S3IPF-718: Correction of the changes for RID 510 and 515	Present table
20	1.2	S3IPF-732: Completion of missing sections regarding the MWR L1b product	7.1.4 7.3.4
21	1.2	S3IPF-734: Removal of the reference to the Drivers TN and introduction of the reference to the Product Structure Volume	7.2
22	1.2	S3IPF-722: Correction of reference to S3 File Naming Convention	3.3
23	1.3	Update of the specification of the MWR Calibration Product: - Removal of the time delay for NIR and DNB calibration - Correction of the dimensions of the product Adding of the monitoring parameter "Corrected noise injection temperature"	6.1.3
24	1.3	S3IPF-714: Adding the clarification about the meaning of instrument A (nominal) and instrument B (redundant) for the operating instrument parameter	4.2.1.4 6.1.1.4 6.2.4.6.155
25	1.3	S3IPF-994: Removal of the TBC regarding the CF convention version	4.2.1.3 6.1.1.3

No.	Change in Issue	Description	Affected Section
26	1.3	S3IPF-893: The Secondary Metadata are removed from the MWR products	6.1.2.3 6.1.3.3
27	1.3	S3IPF-876: Update of the Product Size Table	9
28	1.3	S3IPF-742: Adding a state for the flag of Meteo Map Availability	6.2.4.6.127
29	1.3	S3IPF-733: Correction of the introduction sentence	7.1.5
30	1.3	S3IPF-731: Update of the Information Package Map tables	7.1
31	1.3	S3IPF-729: Rewording of the introductory sentence	7
32	1.3	S3IPF-725: Renaming of the paragraphs in the Product Format Specifications section	4.2 6.2
33	1.3	S3IPF-720: Removal of the reference to the document itself	1.3.2
34	1.3	Adding the missing description of the parameter flag_ptr_main_width_c_l1b_cal1_sar_norm in the SRAL L1 Calibration product SR_1_CAL	6.1.1.4.2
35	1.3	Correction of some netCDF Attributes of the L2 variables pasted from the L1b product (FillValue missing)	6.2.4.6
36	1.3	Modification of the comment attribute of i2q2_meas_ku_l1b_echo_sar_ku parameter	4.2.1.4.2
37	1.3	Removal of the global attribute "xref_doris_uso" for the SRAL L1 Calibration product	6.1.1.4
38	1.3	Update of the Specific Global Attributes facing the Common ones defined in the Product Structure document	4.2.1.4 6.1.1.4 6.1.2.4 6.1.3.4
39	1.3	Adding the missing "add_offset" attribute (equals to 0) when "scale_factor" is present	All
40	1.3	Adding the Global Attributes for the SRAL L2 data files	6.2.4.4
41	1.3	S3IPF-976/454/727: Change in the netCDF files format presentation, according to the Product Structure document	4.2 6.2
42	1.3	S3IPF-754: Precision regarding the content of the C-band variables	6.2.4.5
43	1.3	S3IPF-719: The TOC of the document has been fixed	
44	1.3	S3IPF-832: Adding of PLRM in the product tree	3.1
45	1.4	Update the size of the SRAL MEAS L1 product	9
46	1.5	Information package map and data object section update	5.1, 5.3

No.	Change in Issue	Description	Affected Section
47	1.6	MWR measurement file name aligned between summary and data object tables	4.2.3
48	1.6	Update of the Platform information in the SRAL/MWR L2 product	6.2.4.6.117 6.2.4.6.118 6.2.4.6.119 6.2.4.5
49	1.7	Typo correction following RID S3IPF-833	3.2
50	1.8	Correct MWR product size	7
51	1.8	Correct the dimension of UTC_sec_cal_nir_mwr_l1b parameter in the MWR calibration product	6.1.3.4
52	1.8	MWR L1b product: Addition of the applied receiver (gain corrected of the temperature)	6.1.2.4
53	1.9	Reference update	1.3
54	1.10	Typo correction for the name of the off-nadir yaw parameter	6.2.4.6.119
55	1.10	Precision regarding the fact that the off-nadir angles are SRAL angles	6.2.4.6.117 6.2.4.6.118 6.2.4.6.119
56	1.10	Modification of the NetCDF attributes (scale factor and offset) of Beam_Ang_Stack variable in SRAL L1b product to improve its resolution	4.2.1.4.2
57	1.10	Modification of the NetCDF attributes (scale factor) of Max_Stack variable in SRAL L1b product to avoid overflow	4.2.1.4.2
58	1.10	Upgrade of waveform size, from uint-16 to uint-32	6.2.4.6.124
59	1.10	Update size of SRAL/MWR products	96.2.4.6.124
60	1.11	S3IPF-2108. Change text of 1.10 amendment record	Amendment record sheet
61	2.0	Adding the L1A and L1B-S products in the Product Size section	9
62	2.0	Adding the L1A and L1B-S in the general product overview	3 3.1
63	2.0	Adding the definition of the L1A product	4.2.2
64	2.0	Adding the definition of the L1B-S product	4.2.3
65	2.0	S3IPF-2110: Clarification of the formulation regarding the size of the individual measurement	9
66	2.0	S3PDGS-2338: Update typo in comment attribute of ssha and tides variables	6.2.4.6.41 6.2.4.6.92 6.2.4.6.93 6.2.4.6.94
67	2.1	S3IPF-2150: add reference of the input IODD document	1.3.1
68	2.1	S3IPF-2145: add a precision regarding the multilook to SAR stacked I2+Q2 waveforms.	4.2.1.4.2 4.2.3.4.1

No.	Change in Issue	Description	Affected Section
69	2.1	S3IPF-2139: correct typo on L1BS product name	Figure 3 1
70	2.1	Corrections of typos detected while implementing L1A/L1BS product generation	4.2.2.4.1 4.2.2.4.2 4.2.3.4.1 4.2.3.4.2
71	2.1	Reduce accuracy of max_stack to avoid overflow Align max_stack scale factor between L1B and L1BS. Align power_var_stack scale factor with max_stack scale factor	4.2.1.4.2 4.2.3.4.1
72	2.1	Reduce accuracy of PTR power to avoid overflow	6.1.1.4.1 (Table 4 18) 6.1.1.4.2 (Table 4 19)
73	2.2	S3IPF-2180 : typo in fill_value of power_var_stack l1bs_echo_sar_ku	Table 4 14
74	2.3	Change I&Q echoes variables description	4.2.2.4.1 9
75	2.4	Update SR-1 product map	Table 4 5
76	2.5	Update SR-1BS product map, following quantization of L1BS stack power	Table 4 14 4.2.3.4
77	2.5	Typo	Table 4 10
78	2.6	SIIMPC-1076: Overflow of the MWR atmospheric attenuation in Ku band. Update of product maps.	Table 4 35 6.2.4.6.82
79	2.6	Update MWR along-track averaging flag	6.2.4.6.137
80	2.6	Update of the description of one parameter of MWR LTM file	6.1.3.4
81	2.6	Add a sentence to clarify the zero-frequency gate of the waveform, for CAL2 correction	6.1.1.4.4 6.1.1.4.5 Table 4 21 Table 4 22
82	2.6	MWR : Add quality flag related to processing of new calibration timeline	Table 4 26
83	2.6	SIIMPC-1842: Provide sigma0 corrected from atmospheric attenuation in L2 products	6.2.4.6.26 6.2.4.6.71
84	2.6	SIIMPC-1844: Update of filtered range in C band variable name	6.2.4.5 6.2.4.6.25
85	2.6	SIIMPC-1467 : Update of platform mispointing angle storage type	4.2.2.4 4.2.3.4 6.2.4.6.117 6.2.4.6.118
86	2.6	SIIMPC-1503 : Update of solution 2 tides variable comments	6.2.4.6.93 6.2.4.6.95 6.2.4.6.97
87	2.6	SIIMPC-1847: Addition of "Ice" waveform quality checks in SRAL L2	6.2.4.5 6.2.4.6.147
88	2.6	SIIMPC-1846: Addition of orbit type in SRAL L2	6.2.4.5 6.2.4.6.127

No.	Change in Issue	Description	Affected Section
89	2.6	SIIMPC-1843: Addition of 1Hz/20Hz indexes in SRAL L2	6.2.4.5 6.2.4.6.3 6.2.4.6.4 6.2.4.6.5
90	2.6	SIIMPC-1252: Update of C-band corrected locations comments	6.2.4.6.7 6.2.4.6.64
91	2.6	SIIMPC-1843: Update of the unit of UTC_sec fields	4.2.1.4 4.2.2.4 4.2.3.4 6.1.1.4 6.2.4.6.1
92	2.6	SIIMPC-1748: Add a comment to L1A cal2 gprw variables for clarification	4.2.2.4.1
93	2.6	SIIMPC-1416: Add a comment to L1A cal1 and cal2 index variables for clarification	4.2.2.4.1
94	2.6	SIIMPC-1537 and SIIMPC-1591: Add a global attribute to reference the file use for time correlation	4.2.1.4 4.2.2.4 4.2.3.4 6.2.4.4
95	2.7	SIIMPC-1847 follow-on: Separation between low and high peakiness failures	6.2.4.6.147
96	2.7	SIIMPC-1503 follow-on: Update of SSHA variables comments	6.2.4.6.41
97	2.8	SIIMPC-1843: Update of the unit of UTC_sec fields for MWR L1B products	6.1.2.4 6.1.3.4
98	2.9	Level 1 information are gathered in a separate document	
99	2.10	Add acquisition info specification	5.1.1 5.1.1.1 5.1.1.4 5.1.1.5 6.3.1
100	2.11	Correction of SR_1_SRA manifest: ID must be unique Change unit to dB/Hz for GPRW CAL2 slopes	6.3.1 5.1.4.4.4 5.1.4.4.5

1. INTRODUCTION

1.1 Purpose and Scope

This document aims to identify and specify the format of the Sentinel 3 SRAL and MWR products for Level 1.

1.2 Structure of the Document

Chapter Number	Title	Contents
1	INTRODUCTION	This section.
2	OVERVIEW OF THE INSTRUMENT	A description of the main features and characteristics of the SRAL and MWR instruments is provided here.
3	PRODUCT OVERVIEW	The Product Tree for SRAL and MWR instruments and the product names convention are specified here.
4	SRAL/MWR PRODUCT FORMAT SPECIFICATION: COMMON PART	In this section the format of the common part of SRAL and MWR Products
5	SRAL/MWR PRODUCT FORMAT SPECIFICATION	In this section the format of each SRAL and MWR Products for Level 1 is specified.
6	MANIFEST FILE DESCRIPTION	In this section details for the implementation of the manifest file are provided.
7	XML SCHEMA	In this section details on the manifest schemas are provided.
8	PRODUCT SIZE	In this section details of the size of each product are provided.

Table 1-1: Document Structure

1.3 Applicable and Reference Documents

1.3.1 Applicable documents

The following table lists the documents with a direct bearing on the content of this document.

ID	Document	Reference
AD- 1	Sentinel 3 PDGS File Naming Convention	EUM/LEO-SEN3/SPE/10/0070 GMES-S3GS-EOPG-TN-09-0009, 1.4, 24/06/2016

ID	Document	Reference
AD- 2	Product Data Format Specification - Product Structures	S3IPF.PDS.002, Issue 1.7, 09/10/2017
AD- 3	Drivers for the S3 PDGS Processing Function Implementation	GMES-GSEG-EOPG-TN-11-0062, i1r7, 27/06/2014
AD- 4	Metadata Specification, Excel document	S3IPF.PDS.008, i3r4 – 09/10/2017
AD- 5	XML Schemas.zip (Zip file containing all the schemas used to represent the metadata)	S3IPF PDS 009, i3r1 – 09/10/2017
AD- 6	Sentinel SAFE control book volume 1 – core specifications,	GAEL-P264-DOC-0001-01-01, i1r1, 05/06/2012
AD- 7	S-3 Core PDGS Implementation, System Technical Budget	S3PDGS REP 002, i3r1, 15/11/2012
AD- 8	SRAL Input/Output Definition Document for Product Level 1a/1b-S	S3-TN-ESA-SR-0433
AD-9	Product Data Format Specification – SRAL/MWR Level 2 Land	S3IPF.PDS.003.2, Issue 2.11, 12/01/2018
AD-10	Product Data Format Specification – SRAL/MWR Level 2 Marine	S3IPF.PDS.003.3, Issue 2.11, 12/01/2018
AD-11	Auxiliary Data Format Specification - MWR a SRAL Level 1	S3IPF.PDS.007.6, i2r10 05/12/2017

1.3.2 Reference documents

The following reference documents contain information supporting this document.

ID	Document	Reference
RD- 1	CCSDS 661.0-B-0 XFDU structure and construction rules	Issue Sept. 2008
RD- 2	Standard Archive Format for Europe. Control Book. Volume 1. Core Specifications.	PGSI-GSEG-EOPG-FS-05-0001, i1r14, 12/11/2010
RD- 3	S3PDGS Product Data Format Specification - Level 0	S3IPF.PDS.001, i1r8, 09/10/2017
RD- 4	Surface Topography Mission (STM) L0 and L1 Products Specifications (SY-4)	S3-IF-CLS-SY-00061, i9r0, 13/07/2012

1.4 Terms, Definitions and Abbreviated Terms

Terms, Definitions and Abbreviated Terms are identified in the common volume of the product format specifications in [AD- 2].

2. OVERVIEW OF THE INSTRUMENT

2.1 Altimeter (SRAL)

SRAL (Synthetic Aperture Radar Altimeter) is a redundant dual-frequency (C-band and Ku-band) instrument for determining the two-way delay of the radar echo from the Earth's surface with a precision better than a nanosecond. SRAL altimeter measurements are performed either in Low Resolution Mode (LRM) or in Synthetic Aperture Radar (SAR) mode. LRM mode is the conventional altimeter pulse limited mode with interleaved Ku-band and C-band pulses, while SAR mode is the high along track resolution mode based on Synthetic Aperture Radar processing, made of Ku-band bursts, each of them being surrounded by two C-band pulses (for ionosphere delay correction) to be also able to operate over open ocean.

- In LRM mode, pulses are transmitted at the Pulse Repetition Frequency (PRF about 1924 Hz) rhythm, following a typical pattern of 3 Ku-band pulses / 1 C-band pulse / 3 Ku-band pulses. These pulses are processed and averaged on-board to provide a power waveform (128 I+Q2 samples) about every 50.9 ms, corresponding to the averaging of 84 Ku-band pulses and of 14 C-band pulses. This measurement is called an elementary measurement or a 20-Hz measurement. It contains Ku-band and C-band waveforms and associated parameters.
- In SAR mode, the Pulse Repetition Frequency (PRF) is about 17 800 Hz. Pulses are transmitted by a series of 66 (1 C-band pulse / 64 Ku-band pulses / 1 C-band pulses), called a burst, corresponding to a duration of about 12.74 ms. A burst corresponds thus to a 80-Hz measurement, and contains 64 Ku-band and 2 C-band waveforms (128 I and Q samples for each of them).

For both LRM and SAR modes, the tracking function may be a closed loop or an open loop function. "Closed loop" means that the range tracking parameters are computed by the tracking algorithm, while in "Open loop" means that these parameters are computed directly from altitude values read from a one-dimensional OLTC file stored in the instrument coupled with the position/velocity coordinates of the navigation bulletin sent every second to the platform by the GPS receiver.

2.2 Radiometer (MWR)

MWR radiometer is a dual frequency, single polarization and fully redounded radiometer. The centre frequencies of each channel are 23.8 GHz and 36.5 GHz, with a channel bandwidth of 200 MHz.

MWR is a Noise Injection Radiometer (NIR). The noise injection operation consists of adding noise to the antenna branch in order to equal the temperature of the internal load noise temperature. This balanced condition takes places at a common plane for all involved temperatures, which has been defined at the output of the Dicke switch. The amount of injected noise allows the retrieval of the brightness temperature.

There are three main operational states: observation, monitoring, and calibration.

During observation, the radiometer is looking through the main antenna towards the Earth and, in case of a brightness temperature lower than the reference temperature, the noise injection pulse is used to retrieve this brightness temperature.

During monitoring, the MWR L1b monitoring parameters are computed from Level 0 monitoring parameters. The monitoring operation consists of looking through the deep sky through the sky horn, whose brightness temperature is well known. This processing is needed to monitor the level of injected noise and its stability.

During calibration, the level of noise injection temperature in balanced mode and the receiver gain in non-balanced mode are retrieved. In both cases, the deep sky is used as target with fixed known brightness temperatures.

3. PRODUCT OVERVIEW

A graphical representation of the product tree for SRAL and MWR instrument is provided in Figure 3-1.

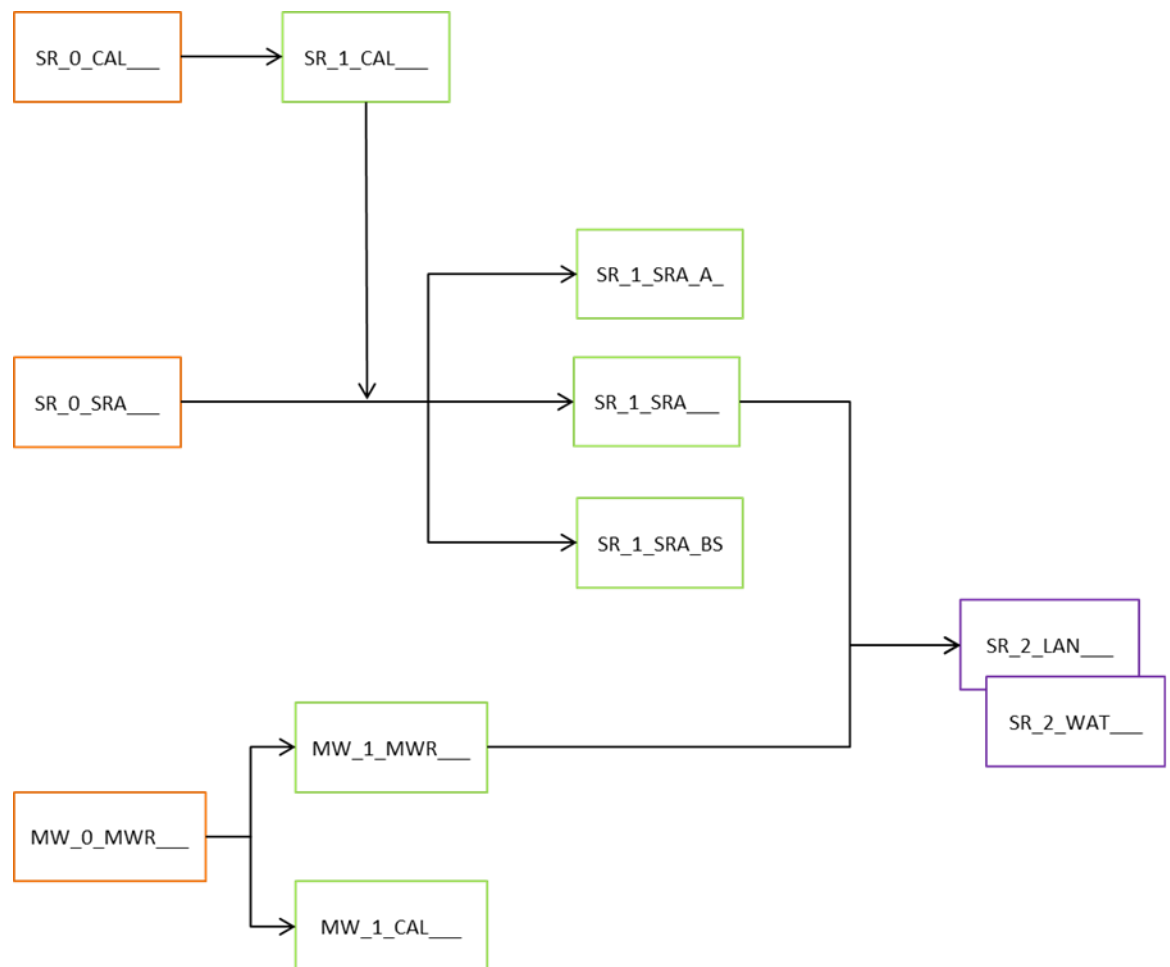


Figure 3-1: SRAL/MWR Product Tree – from Level 0 up to Level 2

3.1 SRAL Product Tree

The S-3 SRAL products are summarized in the next table:

Product type	Description	Level
SR_0_SRA___	SRAL ISPs Raw Data for LRM and SAR Mode	Level 0
SR_0_CAL___	SRAL ISPs Raw Data for Calibration Mode	Level 0
SR_1_SRA___	Echos parameters for LRM, PLRM and SAR mode (resolution 20Hz)	Level 1
SR_1_SRA_A_	Echos parameters for PLRM and SAR mode (resolution 80Hz)	Level 1

SR_1_SRA_BS	Echos parameters for LRM, PLRM and SAR mode (resolution 20Hz), completed with SAR expert information	Level 1
SR_1_CAL____	Calibration parameters for LRM and SAR mode	Level 1
SR_2_LAN____	1-Hz and 20-Hz Ku and C bands parameters (LRM/SAR/PLRM), waveforms. Over Land	Level 2
SR_2_WAT____	1-Hz and 20-Hz Ku and C bands parameters (LRM/SAR/PLRM), waveforms. Over Water	Level 2

Table 3-1: SRAL Product Tree

Note that the Level 0 products are listed here only for the sake of completeness however these products are not in the scope of this document and they won't be addressed any longer in this document. Please refer to RD-3 for the specification of these products.

Regarding the Level 1 products, they are offered in the form of the following products:

- SRAL Level 1A products contain the unpacked L0 complex echoes that have been sorted and calibrated.
- SRAL Level 1B products include the LRM/SAR averaged measurements (20Hz)
- SRAL Level 1B-S products include the regular Level 1B product, enriched with SAR expert information (complex I&Q echoes after slant range correction, without the multi-looking being performed, ...).

As far as the Level 2 products are concerned, they are split into Land (SR_2_LAN____) and Marine (SR_2_WAT____) products according to their contents. In particular:

- SRAL Level 2 Marine Products contain information sensed over the open ocean, the coastal areas, the sea-ice and over part of the land within a certain distance from the coastline.
- SRAL Level 2 Land Products contain information sensed over land, the coastal areas, land ice and inland water.

The measurements over the coastal areas and over part of the land within a certain distance from the coastline are contained both in the land and marine products in order to ensure the analysis of transition and meaningful continuity of segments.

3.2 MWR Product Tree

The S-3 MWR products are summarized in Table 3-2.

Product type	Description	Availability to the User	Level
MW_0_MWR____	Observation, calibration and Monitoring Parameters from MWR ISPs.	Not Available	Level 0
MW_1_MWR____	Level 1 observation data	Not Available	Level 1

MW_1_CAL____	Level 1 monitoring and calibration data	Not Available	Level 1
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Table 3-2: MWR Product Tree

Note that the Level 0 products are listed here only for the sake of completeness however these products are not in the scope of this document and they won't be addressed any longer in this document. Please refer to [RD- 3] for the specification of these products.

3.3 Product Naming Convention

The names of the SRAL and MWR products comply with the Sentinel 3 file naming convention, according to [AD- 1].

4. SRAL/MWR PRODUCT FORMAT SPECIFICATION: COMMON PART

4.1 General Product Structure

4.1.1 Package Layout

The format of every Sentinel 3 product is described in [AD- 2]. The Product Package is sketched in Figure 4-1.

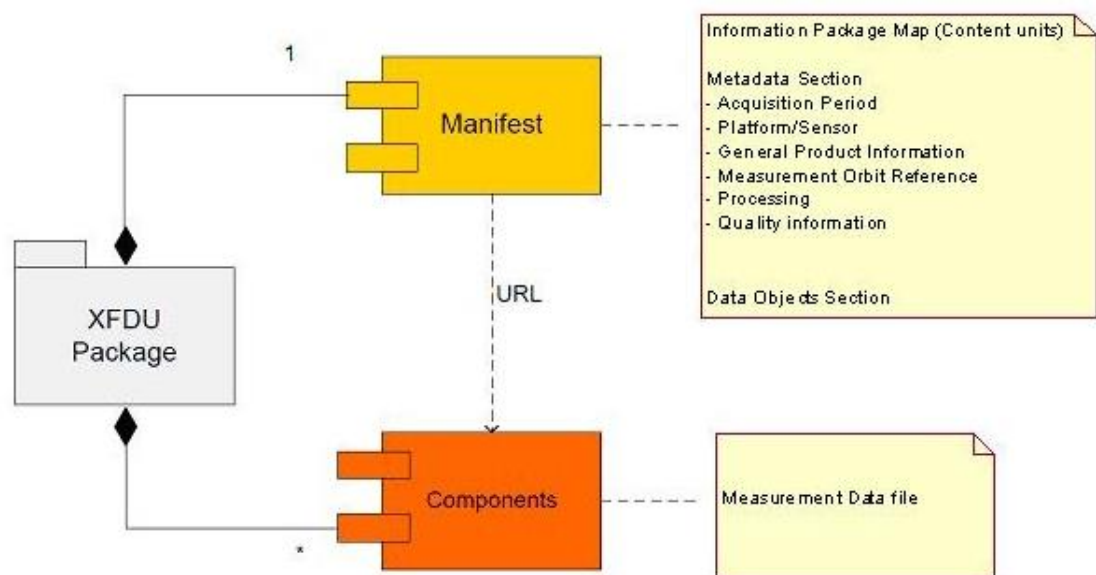


Figure 4-1: XFDU package

In the following sections the physical composition of each package is specified for the SRAL and MWR instruments.

The components of the package that are not part of the current operational production baseline are identified with a flag in the column N.O. (Not Operational). These components might be required to be generated at a later time during the mission lifecycle.

4.1.2 Primary Metadata

The primary metadata is contained in various wrapped metadata units within the Sentinel-SAFE manifest: "acquisitionPeriod", "platform", "generalProductInformation", "measurementOrbitReference", "processing", "measurementQualityInformation", "measurementFrameSet", "generalProductInformation" and "sralProductInformation". The fields are described in [AD- 5].

4.1.3 Measurement Data Files

The format of the measurement data files is NetCDF 4.

A NetCDF file contains dimensions, variables, and attributes, which all have both a name by which they are identified. These components can be used together to capture the meaning of data and relations among data fields in an array-oriented data set.

The Common global attributes defined for each netCDF file composing the products are fully defined in the common volume of the product data format specification documents named "Product structures" and referenced as [AD- 2].

In addition to these Common Global Attributes, Specific Global Attributes are defined in the present document for each netCDF file.

5. SRAL/MWR PRODUCT FORMAT SPECIFICATION

5.1 SRAL and MWR Level 1 Products

The format of this data is NetCDF 4. A NetCDF file contains dimensions, variables, and attributes, which all have both a name by which they are identified. These components can be used together to capture the meaning of data and relations among data fields in an array-oriented data set.

5.1.1 SRAL “SR_1_SRA___”

A Level 1 SRAL product contains one “measurement data file” containing the L1b measurements parameters:

- ECHO_LRM: L1b Tracking measurements in LRM mode (20 Hz – Ku and C bands)
- ECHO_SAR_Ku: L1b Tracking measurements in SAR mode - Ku band (20-Hz)
- ECHO_PLRM: L1b Tracking measurements in pseudo-LRM mode - (20 Hz – Ku and C bands)

A Level 1 SRAL product also contains one “acquisition data file” containing the L1b acquisition parameters:

- TM_ACQ: L0 telemetry ISP packet information generated during acquisition mode.

5.1.1.1 Product summary

SR_1_SRA___		Description			
		L1b Echos parameters for LRM and SAR mode			
		Acquisition parameters			
Product Level	Diss. Timeliness	Product Category		Application Domain	Spatial Resolution
1	(NRT/STC/NTC)	Not Available to the user		LAN WAT	
Product Dissemination Unit N/A		Number of Package components	Number of Measurement Data Files	Number of Annotation Data Files	Number of Representation Information Files
		3 ¹	2	0	0
Product Package Structure					
Manifest file (see section 5.1.1.2 for more details)					
File name			Composition		
xfdumanifest.xml					
Measurement Data files (see section 5.1.1 for more details)					N.O.
File name			Composition		
measurement.nc			L1b Tracking measurements: ECHO_LRM ECHO_SAR_Ku, ECHO_PLRM		
File name			Composition		
acquisition.nc			Acquisition parameters		
Annotation Data files					N.O.
File name			Composition		
none					
Representation Information Files					N.O.
File name			Composition		
none					

Table 5-1: SRAL Measurement Level 1B product physical composition

¹ Number of Package components includes the manifest and the OLQC Report.

5.1.1.2 Manifest File

The structure of the Manifest element is described in [AD- 2].

5.1.1.3 Product Metadata

According to [AD- 2], Wrapped Metadata are grouped in Primary Metadata, common to all Sentinel 3 products and Secondary Metadata, specific for instrument and processing level.

Primary Metadata are described in [AD- 2].

Secondary Metadata for the SRAL instrument are reported in Table 5-2. Last columns of the table indicate the applicability of Metadata fields to the processing Level.

*< Complete secondary metadata is described in details in [AD- 4].
The content of this table will be embedded in the document when it will be finalized >*

Table 5-2: Secondary Metadata for SR_1_SRA___ products

5.1.1.4 L1B Measurement Data Files: measurement.nc

The content of the Level 1B SRAL product is described below:

Element name	Description	Range or value	T	D
time_l1b_echo_lrm	Number of L1B ECHO_LRM measurements			
time_l1b_echo_sar_ku	Number of L1B ECHO_SAR_Ku measurements			
time_l1b_echo_plrm	Number of L1B ECHO_PLRM measurements			
echo_sample_ind	Number of samples in a waveform			
max_multi_stack_ind	Maximum number of multilook beams per stack			
<Specific global attributes>	:Conventions = netCDF convention :mission_name = Name of the mission :altimeter_sensor_name = Name of the altimeter sensor :gnss_sensor_name = Name of the GNSS sensor :doris_sensor_name = Name of the DORIS sensor :acq_station_name = Identification of the acquisition station :first_meas_time = UTC Date of the first measurement of the data set (YYYY-MM-DD HH:MM:SS.mmmmmm) :last_meas_time = UTC Date of the last measurement of the data set (YYYY-MM-DD HH:MM:SS.mmmmmm) :xref_altimeter_level0 = Name of the altimeter level 0 data file :xref_time_correlation = Name of the file containing the time correlation Data :xref_altimeter_orbit = Name of the file containing the Orbit Data :xref_doris_uso = Name of the file containing the DORIS-derived USO frequency :xref_altimeter_ltm_lrm_cal1 = Name of the LTM file containing the LRM mode CAL1 parameters :xref_altimeter_ltm_sar_cal1 = Name of the LTM file containing the SAR mode CAL1 parameters :xref_altimeter_ltm_ku_cal2 = Name of the LTM file containing the Ku-band CAL2 parameters :xref_altimeter_ltm_c_cal2 = Name of the LTM file containing the C-band CAL2 parameters :xref_altimeter_characterisation = Name of the altimeter characterisation data file :semi_major_ellipsoid_axis = Semi-major axis of the reference ellipsoid (meters) :ellipsoid_flattening = Flattening coefficient of the reference ellipsoid		S	
			ul D	

echo_sample_ind	number of samples in I2+Q2, I and Q echoes		sc	echo_sample_ind
units	Unit name	count		1
comment	Set to be compliant with the CF-1.6 convention			1
max_multi_stack_ind	maximum number of multilook beams per stack		ss	max_multi_stack_ind
units	Unit name	count		1
comment	Set to be compliant with the CF-1.6 convention			1

Table 5-3: Content of the Level 1B measurement data file (SR_1_SRA___ product)

In addition to the 2 variables shown in the previous table, the Level 1B SRAL product contains the variables described in sections 5.1.1.4.1, 5.1.1.4.2 and 5.1.1.4.3.

5.1.1.4.1 ECHO_LRM

The Echo LRM content is reported in the table below:

Element name	Description	Range or value	T	D
time_l1b_echo_lrm	UTC : l1b_echo_lrm mode		D	time_l1b_echo_lrm
standard_name	Name of the physical quantity following the NetCDF Climate and Forecast (CF) Metadata Conventions	time		1
calendar		gregorian		1
units	Unit name	seconds since 2000-01-01 00:00:00.0		1
UTC_day_l1b_echo_lrm	day UTC : l1b_echo_lrm mode		ss	time_l1b_echo_lrm
units	Unit name	days since 2000-01-01 00:00:00.0		1
_FillValue	Default value for unused or not computed elements	32767		1
UTC_sec_l1b_echo_lrm	seconds in the day UTC : l1b_echo_lrm mode		D	time_l1b_echo_lrm
units	Unit name	s		1
_FillValue	Default value for unused or not computed elements	18446744073709551616		1
GPS_time_l1b_echo_lrm	GPS time : l1b_echo_lrm mode		D	time_l1b_echo_lrm
calendar		gregorian		1
units	Unit name	seconds since 1980-01-06 00:00:00.0		1
_FillValue	Default value for unused or not computed elements	18446744073709551616		1
isp_coarse_time_l1b_echo_lrm	ISP coarse time : l1b_echo_lrm mode		ul	time_l1b_echo_lrm
units	Unit name	second		1
_FillValue	Default value for unused or not computed elements	4294967295		1
isp_fine_time_l1b_echo_lrm	ISP fine time : l1b_echo_lrm mode		sl	time_l1b_echo_lrm
units	Unit name	2 ⁻²⁴ second		1
_FillValue	Default value for unused or not computed elements	2147483647		1
sral_fine_time_l1b_echo_lrm	ISP SRAL fine datation : l1b_echo_lrm mode		ul	time_l1b_echo_lrm
units	Unit name	137.5*10 ⁻⁹ second		1
_FillValue	Default value for unused or not computed elements	4294967295		1
lat_l1b_echo_lrm	latitude : l1b_echo_lrm mode		sl	time_l1b_echo_lrm
standard_name	Name of the physical quantity following the NetCDF Climate and Forecast (CF) Metadata Conventions	latitude		1

scale_factor	The data must be multiplied by this factor after reading	1.00e-06		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	degrees_north		1
_FillValue	Default value for unused or not computed elements	2147483647		1
lon_l1b_echo_lrm	longitude : l1b_echo_lrm mode		sl	time_l1b_echo_lrm
standard_name	Name of the physical quantity following the NetCDF Climate and Forecast (CF) Metadata Conventions	longitude		1
scale_factor	The data must be multiplied by this factor after reading	1.00e-06		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	degrees_east		1
_FillValue	Default value for unused or not computed elements	2147483647		1
alt_l1b_echo_lrm	altitude of satellite : l1b_echo_lrm mode		sl	time_l1b_echo_lrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	700000.		1
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_echo_lrm lat_l1b_echo_lrm			1
orb_alt_rate_l1b_echo_lrm	orbital altitude rate : l1b_echo_lrm mode		ss	time_l1b_echo_lrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	m/s		1
_FillValue	Default value for unused or not computed elements	32767		1
coordinates	lon_l1b_echo_lrm lat_l1b_echo_lrm			1
flag_time_status_l1b_echo_lrm	time status flag : l1b_echo_lrm mode		sc	time_l1b_echo_lrm
flag_values	Flag values	0b, 1b		1
comment	flag indicating if the time is synchronized or not with GPS time			1
flag_meanings	Flag meanings	synchronization no_synchronization		1
coordinates	lon_l1b_echo_lrm lat_l1b_echo_lrm			1
flag_time_corr_val_l1b_echo_lrm	time correlation validity flag : l1b_echo_lrm mode		sc	time_l1b_echo_lrm
flag_values	Flag values	0b, 1b, 2b		1
comment	flag indicating if the time correlation information is valid provided by OBSW, valid provided by Ground Segment or invalid			1
flag_meanings	Flag meanings	valid_obs		1

		valid_ground_segment invalid		
coordinates	lon_l1b_echo_lrm lat_l1b_echo_lrm			1
flag_man_pres_l1b_echo_lrm	manoeuvre presence flag: l1b_echo_lrm mode		sc	time_l1b_echo_lrm
flag_values	Flag values	0b, 1b		1
flag_meanings	Flag meanings	no_manoeuvre ongoing_manoeuvre		1
coordinates	lon_l1b_echo_lrm lat_l1b_echo_lrm			1
flag_man_thrust_l1b_echo_lrm	manoeuvre thrust flag: l1b_echo_lrm mode		sc	time_l1b_echo_lrm
flag_values	Flag values	0b, 1b		1
flag_meanings	Flag meanings	no_thrust ongoing_thrust		1
coordinates	lon_l1b_echo_lrm lat_l1b_echo_lrm			1
flag_man_plane_l1b_echo_lrm	manoeuvre plane flag: l1b_echo_lrm mode		sc	time_l1b_echo_lrm
flag_values	Flag values	0b, 1b		1
flag_meanings	Flag meanings	in_plane out_of_plane		1
coordinates	lon_l1b_echo_lrm lat_l1b_echo_lrm			1
flag_gnss_status_l1b_echo_lrm	validity flag for the navigation message from the gnss receiver: l1b_echo_lrm mode		sc	time_l1b_echo_lrm
comment	indicating if the navigation message from the GNSS receiver is valid or not valid/available			1
flag_values	Flag values	0b, 1b		1
flag_meanings	Flag meanings	valid invalid_unavailable		1
coordinates	lon_l1b_echo_lrm lat_l1b_echo_lrm			1
x_pos_l1b_echo_lrm	satellite altitude - x component : l1b_echo_lrm mode		D	time_l1b_echo_lrm
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	18446744073709551616		1
y_pos_l1b_echo_lrm	satellite altitude - y component : l1b_echo_lrm mode		D	time_l1b_echo_lrm
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	18446744073709551616		1
z_pos_l1b_echo_lrm	satellite altitude - z component : l1b_echo_lrm mode		D	time_l1b_echo_lrm
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	18446744073709551616		1
x_vel_l1b_echo_lrm	satellite velocity - x component : l1b_echo_lrm mode		D	time_l1b_echo_lrm

units	Unit name	m/s		1
_FillValue	Default value for unused or not computed elements	18446744073709551616		1
y_vel_l1b_echo_lrm	satellite velocity - y component : l1b_echo_lrm mode		D	time_l1b_echo_lrm
units	Unit name	m/s		1
_FillValue	Default value for unused or not computed elements	18446744073709551616		1
z_vel_l1b_echo_lrm	satellite velocity - z component : l1b_echo_lrm mode		D	time_l1b_echo_lrm
units	Unit name	m/s		1
_FillValue	Default value for unused or not computed elements	18446744073709551616		1
nav_bul_status_l1b_echo_lrm	navigation bulletin status : l1b_echo_lrm mode		sc	time_l1b_echo_lrm
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	ok ko		1
coordinates	lon_l1b_echo_lrm lat_l1b_echo_lrm			1
nav_bul_source_l1b_echo_lrm	navigation bulletin source identifier : l1b_echo_lrm mode		sc	time_l1b_echo_lrm
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	gps doris		1
coordinates	lon_l1b_echo_lrm lat_l1b_echo_lrm			1
nav_bul_coarse_time_l1b_echo_lrm	navigation bulletin coarse time : l1b_echo_lrm mode		ul	time_l1b_echo_lrm
units	Unit name	second		1
_FillValue	Default value for unused or not computed elements	4294967295		1
nav_bul_fine_time_l1b_echo_lrm	navigation bulletin fine time : l1b_echo_lrm mode		ul	time_l1b_echo_lrm
units	Unit name	2^-24 second		1
_FillValue	Default value for unused or not computed elements	4294967295		1
seq_count_l1b_echo_lrm	sequence count : l1b_echo_lrm mode		us	time_l1b_echo_lrm
_FillValue	Default value for unused or not computed elements	65535		1
coordinates	lon_l1b_echo_lrm lat_l1b_echo_lrm			1
isp_time_status_l1b_echo_lrm	ISP time status : l1b_echo_lrm mode		sc	time_l1b_echo_lrm
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	SRAL_OBT_extrapolated SRAL_OBT_updated_with_SMU_OBT		1

coordinates	lon_l1b_echo_lrm lat_l1b_echo_lrm			1
oper_instr_l1b_echo_lrm	operating instrument : l1b_echo_lrm mode		sc	time_l1b_echo_lrm
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	A B		1
coordinates	lon_l1b_echo_lrm lat_l1b_echo_lrm			1
comment	Instrument A stands for SRAL Nominal and instrument B stands for SRAL Redundant			1
mode_id_l1b_echo_lrm	LRM mode identifier : l1b_echo_lrm mode		sc	time_l1b_echo_lrm
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	closed_loop open_loop		1
coordinates	lon_l1b_echo_lrm lat_l1b_echo_lrm			1
cl_gain_l1b_echo_lrm	tracking configuration - closed loop gain : l1b_echo_lrm mode		sc	time_l1b_echo_lrm
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	Nominal_value Nominal_value_with_back-off		1
coordinates	lon_l1b_echo_lrm lat_l1b_echo_lrm			1
acq_stat_l1b_echo_lrm	tracking configuration - acquisition status : l1b_echo_lrm mode		sc	time_l1b_echo_lrm
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	no_acquisition acquisition		1
coordinates	lon_l1b_echo_lrm lat_l1b_echo_lrm			1
dem_eeprom_l1b_echo_lrm	tracking configuration - DEM EEPROM read access : l1b_echo_lrm mode		sc	time_l1b_echo_lrm
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	enabled disabled		1
coordinates	lon_l1b_echo_lrm lat_l1b_echo_lrm			1
weighting_l1b_echo_lrm	altimeter configuration - weighting function : l1b_echo_lrm mode		sc	time_l1b_echo_lrm
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1

flag_meanings	Flag meanings	enabled disabled		1
coordinates	lon_l1b_echo_irm lat_l1b_echo_irm			1
loss_track_l1b_echo_irm	loss of track criterion : l1b_echo_irm mode		sc	time_l1b_echo_irm
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	normal loss_of_track		1
coordinates	lon_l1b_echo_irm lat_l1b_echo_irm			1
h0_nav_dem_l1b_echo_irm	altitude command H0 computed with nav DEM : l1b_echo_irm mode		ul	time_l1b_echo_irm
units	Unit name	3.125/64*10 ⁻⁹ s		1
_FillValue	Default value for unused or not computed elements	4294967295		1
coordinates	lon_l1b_echo_irm lat_l1b_echo_irm			1
h0_applied_l1b_echo_irm	applied altitude command H0 : l1b_echo_irm mode		ul	time_l1b_echo_irm
units	Unit name	3.125/64*10 ⁻⁹ s		1
_FillValue	Default value for unused or not computed elements	4294967295		1
coordinates	lon_l1b_echo_irm lat_l1b_echo_irm			1
cor2_nav_dem_l1b_echo_irm	altitude command COR2 computed with nav DEM : l1b_echo_irm mode		ss	time_l1b_echo_irm
units	Unit name	3.125/1024 10 ⁻⁹ s		1
_FillValue	Default value for unused or not computed elements	32767		1
coordinates	lon_l1b_echo_irm lat_l1b_echo_irm			1
cor2_applied_l1b_echo_irm	applied altitude command COR2 : l1b_echo_irm mode		ss	time_l1b_echo_irm
units	Unit name	3.125/1024*10 ⁻⁹ s		1
_FillValue	Default value for unused or not computed elements	32767		1
coordinates	lon_l1b_echo_irm lat_l1b_echo_irm			1
dh0_l1b_echo_irm	distance error computed on the echo of the cycle (N-2) in open loop mode (current cycle)		sl	time_l1b_echo_irm
units	Unit name	3.125/64*10 ⁻⁹ s		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_echo_irm lat_l1b_echo_irm			1
agccode_ku_l1b_echo_irm	AGCCODE for ku band : l1b_echo_irm mode		sc	time_l1b_echo_irm
units	Unit name	dB		1
_FillValue	Default value for unused or not computed elements	127		1
coordinates	lon_l1b_echo_irm lat_l1b_echo_irm			1

agccode_c_l1b_echo_lrm	AGCCODE for c band : l1b_echo_lrm mode		sc	time_l1b_echo_lrm
units	Unit name	dB		1
_FillValue	Default value for unused or not computed elements	127		1
coordinates	lon_l1b_echo_lrm lat_l1b_echo_lrm			1
surf_type_l1b_echo_lrm	altimeter surface type : l1b_echo_lrm mode		sc	time_l1b_echo_lrm
flag_values	Flag values	0b, 1b, 2b, 3b		1
flag_meanings	Flag meanings	open_ocean_or_semi-enclosed_seas enclosed_seas_or_lakes continental_ice land		1
coordinates	lon_l1b_echo_lrm lat_l1b_echo_lrm			1
range_ku_l1b_echo_lrm	corrected range for ku band : l1b_echo_lrm mode		sl	time_l1b_echo_lrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	700000.		1
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_echo_lrm lat_l1b_echo_lrm			1
range_c_l1b_echo_lrm	corrected range for c band : l1b_echo_lrm mode		sl	time_l1b_echo_lrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	700000.		1
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_echo_lrm lat_l1b_echo_lrm			1
uso_cor_l1b_echo_lrm	USO frequency drift correction : l1b_echo_lrm mode		sl	time_l1b_echo_lrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_echo_lrm lat_l1b_echo_lrm			1
int_path_cor_ku_l1b_echo_lrm	internal path correction for ku band : l1b_echo_lrm mode		sl	time_l1b_echo_lrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	m		1

_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_echo_lrm lat_l1b_echo_lrm			1
int_path_cor_c_l1b_echo_lrm	internal path correction for c band : l1b_echo_lrm mode		sl	time_l1b_echo_lrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_echo_lrm lat_l1b_echo_lrm			1
dop_cor_ku_l1b_echo_lrm	doppler correction for ku band : l1b_echo_lrm mode		sl	time_l1b_echo_lrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_echo_lrm lat_l1b_echo_lrm			1
dop_cor_c_l1b_echo_lrm	doppler correction for c band : l1b_echo_lrm mode		sl	time_l1b_echo_lrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_echo_lrm lat_l1b_echo_lrm			1
range_rate_l1b_echo_lrm	range rate : l1b_echo_lrm mode		sl	time_l1b_echo_lrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-03		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	m/s		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_echo_lrm lat_l1b_echo_lrm			1
agc_ku_l1b_echo_lrm	corrected AGC for ku band: l1b_echo_lrm mode		sl	time_l1b_echo_lrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_echo_lrm lat_l1b_echo_lrm			1

comment	AGC corrected for instrumental errors			1
agc_c_l1b_echo_lrm	corrected AGC for c band: l1b_echo_lrm mode		sl	time_l1b_echo_lrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_echo_lrm lat_l1b_echo_lrm			1
comment	AGC corrected for instrumental errors			1
scale_factor_ku_l1b_echo_lrm	scaling factor for sigma0 evaluation for ku band: l1b_echo_lrm mode		sl	time_l1b_echo_lrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
comment	scaling factor corrected for AGC instrumental errors and internal calibration			1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_echo_lrm lat_l1b_echo_lrm			1
scale_factor_c_l1b_echo_lrm	scaling factor for sigma0 evaluation for c band: l1b_echo_lrm mode		sl	time_l1b_echo_lrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
comment	scaling factor corrected for AGC instrumental errors and internal calibration			1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_echo_lrm lat_l1b_echo_lrm			1
agc_cor_ku_l1b_echo_lrm	correction for instrumental errors on AGC for ku band: l1b_echo_lrm mode		sl	time_l1b_echo_lrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_echo_lrm lat_l1b_echo_lrm			1
agc_cor_c_l1b_echo_lrm	correction for instrumental errors on AGC for c band: l1b_echo_lrm mode		sl	time_l1b_echo_lrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1

_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_echo_lrm lat_l1b_echo_lrm			1
sig0_cal_ku_l1b_echo_lrm	internal calibration correction on Sigma0 for ku band: l1b_echo_lrm mode		sl	time_l1b_echo_lrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_echo_lrm lat_l1b_echo_lrm			1
sig0_cal_c_l1b_echo_lrm	internal calibration correction on Sigma0 for c band: l1b_echo_lrm mode		sl	time_l1b_echo_lrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_echo_lrm lat_l1b_echo_lrm			1
i2q2_meas_ku_l1b_echo_lrm	I2+Q2 measurement for ku band : l1b_echo_lrm mode		ul	time_l1b_echo_lrm echo_sample_ind
scale_factor	The data must be multiplied by this factor after reading	1.00e-03		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
_FillValue	Default value for unused or not computed elements	4294967295		1
comment	the echo is corrected for the GPRW effect			1
i2q2_meas_c_l1b_echo_lrm	I2+Q2 measurement for c band : l1b_echo_lrm mode		ul	time_l1b_echo_lrm echo_sample_ind
scale_factor	The data must be multiplied by this factor after reading	1.00e-03		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
_FillValue	Default value for unused or not computed elements	4294967295		1
comment	the echo is corrected for the GPRW effect			1

Table 5-4: Content of the Level 1B measurement data file (SR_1_SRA___ product) : ECHO_LRM parameters

5.1.1.4.2 ECHO_SAR_Ku

The Echo SAR_Ku content is reported in the table below:

Element name	Description	Range or value	T	D
time_l1b_echo_sar_ku	UTC : l1b_echo_sar_ku mode		D	time_l1b_echo_sar_ku
standard_name	Name of the physical quantity following the NetCDF Climate and Forecast (CF) Metadata Conventions	time		1
calendar		gregorian		1
units	Unit name	seconds since 2000-01-01 00:00:00.0		1
UTC_day_l1b_echo_sar_ku	day UTC : l1b_echo_sar_ku mode		ss	time_l1b_echo_sar_ku
units	Unit name	days since 2000-01-01 00:00:00.0		1
_FillValue	Default value for unused or not computed elements	32767		1
UTC_sec_l1b_echo_sar_ku	seconds in the day UTC : l1b_echo_sar_ku mode		D	time_l1b_echo_sar_ku
units	Unit name	s		1
_FillValue	Default value for unused or not computed elements	18446744073709551616		1
GPS_time_l1b_echo_sar_ku	GPS time : l1b_echo_sar_ku mode		D	time_l1b_echo_sar_ku
calendar		gregorian		1
units	Unit name	seconds since 1980-01-06 00:00:00.0		1
_FillValue	Default value for unused or not computed elements	18446744073709551616		1
isp_coarse_time_l1b_echo_sar_ku	ISP coarse time : l1b_echo_sar_ku mode		ul	time_l1b_echo_sar_ku
units	Unit name	second		1
_FillValue	Default value for unused or not computed elements	4294967295		1
isp_fine_time_l1b_echo_sar_ku	ISP fine time : l1b_echo_sar_ku mode		sl	time_l1b_echo_sar_ku
units	Unit name	2 [^] -24 second		1
_FillValue	Default value for unused or not computed elements	2147483647		1
srsl_fine_time_l1b_echo_sar_ku	ISP SRAL fine datation : l1b_echo_sar_ku mode		ul	time_l1b_echo_sar_ku

units	Unit name	137.5*10 ⁻⁹ second		1
_FillValue	Default value for unused or not computed elements	4294967295		1
lat_l1b_echo_sar_ku	latitude : l1b_echo_sar_ku mode		sl	time_l1b_echo_sar_ku
standard_name	Name of the physical quantity following the NetCDF Climate and Forecast (CF) Metadata Conventions	latitude		1
scale_factor	The data must be multiplied by this factor after reading	1.00e-06		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	degrees_north		1
_FillValue	Default value for unused or not computed elements	2147483647		1
lon_l1b_echo_sar_ku	longitude : l1b_echo_sar_ku mode		sl	time_l1b_echo_sar_ku
standard_name	Name of the physical quantity following the NetCDF Climate and Forecast (CF) Metadata Conventions	longitude		1
scale_factor	The data must be multiplied by this factor after reading	1.00e-06		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	degrees_east		1
_FillValue	Default value for unused or not computed elements	2147483647		1
alt_l1b_echo_sar_ku	altitude of satellite : l1b_echo_sar_ku mode		sl	time_l1b_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	700000.		1
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_echo_sar_ku lat_l1b_echo_sar_ku			1
orb_alt_rate_l1b_echo_sar_ku	orbital altitude rate : l1b_echo_sar_ku mode		ss	time_l1b_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	m/s		1

_FillValue	Default value for unused or not computed elements	32767		1
coordinates	lon_l1b_echo_sar_ku lat_l1b_echo_sar_ku			1
flag_time_status_l1b_echo_sar_ku	time status flag : l1b_echo_sar_ku mode		sc	time_l1b_echo_sar_ku
flag_values	Flag values	0b, 1b		1
comment	flag indicating if the time is synchronized or not with GPS time			1
flag_meanings	Flag meanings	synchronization no_synchronization		1
coordinates	lon_l1b_echo_sar_ku lat_l1b_echo_sar_ku			1
flag_time_corr_val_l1b_echo_sar_ku	time correlation validity flag : l1b_echo_sar_ku mode		sc	time_l1b_echo_sar_ku
flag_values	Flag values	0b, 1b, 2b		1
comment	flag indicating if the time correlation information is valid provided by OBSW, valid provided by Ground Segment or invalid			1
flag_meanings	Flag meanings	valid_obsw valid_ground_segment invalid		1
coordinates	lon_l1b_echo_sar_ku lat_l1b_echo_sar_ku			1
flag_man_pres_l1b_echo_sar_ku	manoeuvre presence flag: l1b_echo_sar_ku mode		sc	time_l1b_echo_sar_ku
flag_values	Flag values	0b, 1b		1
flag_meanings	Flag meanings	no_manoeuvre ongoing_manoeuvre		1
coordinates	lon_l1b_echo_sar_ku lat_l1b_echo_sar_ku			1
flag_man_thrust_l1b_echo_sar_ku	manoeuvre thrust flag: l1b_echo_sar_ku mode		sc	time_l1b_echo_sar_ku
flag_values	Flag values	0b, 1b		1
flag_meanings	Flag meanings	no_thrust ongoing_thrust		1
coordinates	lon_l1b_echo_sar_ku lat_l1b_echo_sar_ku			1
flag_man_plane_l1b_echo_sar_ku	manoeuvre plane flag: l1b_echo_sar_ku mode		sc	time_l1b_echo_sar_ku
flag_values	Flag values	0b, 1b		1
flag_meanings	Flag meanings	in_plane		1

		out_of_plane		
coordinates	lon_l1b_echo_sar_ku lat_l1b_echo_sar_ku			1
flag_gnss_status_l1b_echo_sar_ku	validity flag for the navigation message from the gnss receiver: l1b_echo_sar_ku mode		sc	time_l1b_echo_sar_ku
comment	indicating if the navigation message from the GNSS receiver is valid or not valid/available			1
flag_values	Flag values	0b, 1b		1
flag_meanings	Flag meanings	valid invalid_unavailable		1
coordinates	lon_l1b_echo_sar_ku lat_l1b_echo_sar_ku			1
x_pos_l1b_echo_sar_ku	satellite altitude - x component : l1b_echo_sar_ku mode		D	time_l1b_echo_sar_ku
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	18446744073709551616		1
y_pos_l1b_echo_sar_ku	satellite altitude - y component : l1b_echo_sar_ku mode		D	time_l1b_echo_sar_ku
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	18446744073709551616		1
z_pos_l1b_echo_sar_ku	satellite altitude - z component : l1b_echo_sar_ku mode		D	time_l1b_echo_sar_ku
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	18446744073709551616		1
x_vel_l1b_echo_sar_ku	satellite velocity - x component : l1b_echo_sar_ku mode		D	time_l1b_echo_sar_ku
units	Unit name	m/s		1
_FillValue	Default value for unused or not computed elements	18446744073709551616		1
y_vel_l1b_echo_sar_ku	satellite velocity - y component : l1b_echo_sar_ku mode		D	time_l1b_echo_sar_ku
units	Unit name	m/s		1
_FillValue	Default value for unused or not computed elements	18446744073709551616		1
z_vel_l1b_echo_sar_ku	satellite velocity - z component : l1b_echo_sar_ku mode		D	time_l1b_echo_sar_ku
units	Unit name	m/s		1
_FillValue	Default value for unused or not computed elements	18446744073709551616		1

nav_bul_status_l1b_echo_sar_ku	navigation bulletin status : l1b_echo_sar_ku mode		sc	time_l1b_echo_sar_ku
flag_values	Flag values	0b, 1b		1
comment	value the closest in time to the reference measurement			1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	ok ko		1
coordinates	lon_l1b_echo_sar_ku lat_l1b_echo_sar_ku			1
nav_bul_source_l1b_echo_sar_ku	navigation bulletin source identifier : l1b_echo_sar_ku mode		sc	time_l1b_echo_sar_ku
flag_values	Flag values	0b, 1b		1
comment	value the closest in time to the reference measurement			1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	gps doris		1
coordinates	lon_l1b_echo_sar_ku lat_l1b_echo_sar_ku			1
nav_bul_coarse_time_l1b_echo_sar_ku	navigation bulletin coarse time : l1b_echo_sar_ku mode		ul	time_l1b_echo_sar_ku
units	Unit name	second		1
comment	value the closest in time to the reference measurement			1
_FillValue	Default value for unused or not computed elements	4294967295		1
nav_bul_fine_time_l1b_echo_sar_ku	navigation bulletin fine time : l1b_echo_sar_ku mode		ul	time_l1b_echo_sar_ku
units	Unit name	2 [^] -24 second		1
comment	value the closest in time to the reference measurement			1
_FillValue	Default value for unused or not computed elements	4294967295		1
seq_count_l1b_echo_sar_ku	sequence count : l1b_echo_sar_ku mode		us	time_l1b_echo_sar_ku
comment	value the closest in time to the reference measurement			1
_FillValue	Default value for unused or not computed elements	65535		1
coordinates	lon_l1b_echo_sar_ku lat_l1b_echo_sar_ku			1
isp_time_status_l1b_echo_sar_ku	ISP time status : l1b_echo_sar_ku mode		sc	time_l1b_echo_sar_ku

flag_values	Flag values	0b, 1b		1
comment	value the closest in time to the reference measurement			1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	SRAL_OBT_extrapolated SRAL_OBT_updated_with_SMU_OBT		1
coordinates	lon_l1b_echo_sar_ku lat_l1b_echo_sar_ku			1
oper_instr_l1b_echo_sar_ku	operating instrument : l1b_echo_sar_ku mode		sc	time_l1b_echo_sar_ku
flag_values	Flag values	0b, 1b		1
comment	value the closest in time to the reference measurement			1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	A B		1
coordinates	lon_l1b_echo_sar_ku lat_l1b_echo_sar_ku			1
comment	Instrument A stands for SRAL Nominal and instrument B stands for SRAL Redundant			1
SAR_mode_l1b_echo_sar_ku	SAR mode identifier : l1b_echo_sar_ku mode		sc	time_l1b_echo_sar_ku
flag_values	Flag values	0b, 1b, 2b		1
comment	value the closest in time to the reference measurement			1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	closed_loop open_loop open_loop_fixed_gain		1
coordinates	lon_l1b_echo_sar_ku lat_l1b_echo_sar_ku			1
cl_gain_l1b_echo_sar_ku	tracking configuration - closed loop gain : l1b_echo_sar_ku mode		sc	time_l1b_echo_sar_ku
flag_values	Flag values	0b, 1b		1
comment	value the closest in time to the reference measurement			1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	Nominal_value Nominal_value_with_back-off		1

coordinates	lon_l1b_echo_sar_ku lat_l1b_echo_sar_ku			1
acq_stat_l1b_echo_sar_ku	tracking configuration - acquisition status : l1b_echo_sar_ku mode		sc	time_l1b_echo_sar_ku
flag_values	Flag values	0b, 1b		1
comment	value the closest in time to the reference measurement			1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	no_acquisition acquisition		1
coordinates	lon_l1b_echo_sar_ku lat_l1b_echo_sar_ku			1
dem_eeprom_l1b_echo_sar_ku	tracking configuration - DEM EEPROM read access : l1b_echo_sar_ku mode		sc	time_l1b_echo_sar_ku
flag_values	Flag values	0b, 1b		1
comment	value the closest in time to the reference measurement			1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	enabled disabled		1
coordinates	lon_l1b_echo_sar_ku lat_l1b_echo_sar_ku			1
weighting_l1b_echo_sar_ku	altimeter configuration - weighting function : l1b_echo_sar_ku mode		sc	time_l1b_echo_sar_ku
flag_values	Flag values	0b, 1b		1
comment	value the closest in time to the reference measurement			1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	enabled disabled		1
coordinates	lon_l1b_echo_sar_ku lat_l1b_echo_sar_ku			1
loss_track_l1b_echo_sar_ku	loss of track criterion : l1b_echo_sar_ku mode		sc	time_l1b_echo_sar_ku
comment	value the closest in time to the reference measurement			1
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	normal loss_of_track		1

coordinates	lon_l1b_echo_sar_ku lat_l1b_echo_sar_ku			1
h0_nav_dem_l1b_echo_sar_ku	altitude command H0 computed with nav DEM : l1b_echo_sar_ku mode		ul	time_l1b_echo_sar_ku
units	Unit name	3.125/64*10 ⁻⁹ s		1
comment	value the closest in time to the reference measurement			1
_FillValue	Default value for unused or not computed elements	4294967295		1
coordinates	lon_l1b_echo_sar_ku lat_l1b_echo_sar_ku			1
h0_applied_l1b_echo_sar_ku	applied altitude command H0 : l1b_echo_sar_ku mode		ul	time_l1b_echo_sar_ku
units	Unit name	3.125/64*10 ⁻⁹ s		1
comment	value the closest in time to the reference measurement			1
_FillValue	Default value for unused or not computed elements	4294967295		1
coordinates	lon_l1b_echo_sar_ku lat_l1b_echo_sar_ku			1
cor2_nav_dem_l1b_echo_sar_ku	altitude command COR2 computed with nav DEM : l1b_echo_sar_ku mode		ss	time_l1b_echo_sar_ku
units	Unit name	3.125/1024 10 ⁻⁹ s		1
comment	value the closest in time to the reference measurement			1
_FillValue	Default value for unused or not computed elements	32767		1
coordinates	lon_l1b_echo_sar_ku lat_l1b_echo_sar_ku			1
cor2_applied_l1b_echo_sar_ku	applied altitude command COR2 : l1b_echo_sar_ku mode		ss	time_l1b_echo_sar_ku
units	Unit name	3.125/1024*10 ⁻⁹ s		1
comment	value the closest in time to the reference measurement			1
_FillValue	Default value for unused or not computed elements	32767		1
coordinates	lon_l1b_echo_sar_ku lat_l1b_echo_sar_ku			1
dh0_l1b_echo_sar_ku	distance error computed on the echo of the cycle (N-2) in open loop mode (current cycle)		sl	time_l1b_echo_sar_ku
units	Unit name	3.125/64*10 ⁻⁹ s		1
comment	value the closest in time to the reference measurement			1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_echo_sar_ku lat_l1b_echo_sar_ku			1

agccode_ku_l1b_echo_sar_ku	AGCCODE for ku band : l1b_echo_sar_ku mode		sc	time_l1b_echo_sar_ku
units	Unit name	dB		1
comment	value the closest in time to the reference measurement			1
_FillValue	Default value for unused or not computed elements	127		1
coordinates	lon_l1b_echo_sar_ku lat_l1b_echo_sar_ku			1
surf_type_l1b_echo_sar_ku	altimeter surface type : l1b_echo_sar_ku mode		sc	time_l1b_echo_sar_ku
flag_values	Flag values	0b, 1b, 2b, 3b		1
comment	value the closest in time to the reference measurement			1
flag_meanings	Flag meanings	open_ocean_or_semi-enclosed_seas enclosed_seas_or_lakes continental_ice land		1
coordinates	lon_l1b_echo_sar_ku lat_l1b_echo_sar_ku			1
range_ku_l1b_echo_sar_ku	corrected range for ku band : l1b_echo_sar_ku mode		sl	time_l1b_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	700000.		1
units	Unit name	m		1
comment	reference range corrected for USO frequency drift and internal path correction			1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_echo_sar_ku lat_l1b_echo_sar_ku			1
uso_cor_l1b_echo_sar_ku	USO frequency drift correction : l1b_echo_sar_ku mode		sl	time_l1b_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	m		1
comment	value the closest in time to the reference measurement			1

_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_echo_sar_ku lat_l1b_echo_sar_ku			1
int_path_cor_ku_l1b_echo_sar_ku	internal path correction for ku band : l1b_echo_sar_ku mode		sl	time_l1b_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	m		1
comment	value the closest in time to the reference measurement			1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_echo_sar_ku lat_l1b_echo_sar_ku			1
range_rate_l1b_echo_sar_ku	range rate : l1b_echo_sar_ku mode		sl	time_l1b_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-03		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	m/s		1
comment	value the closest in time to the reference measurement			1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_echo_sar_ku lat_l1b_echo_sar_ku			1
agc_ku_l1b_echo_sar_ku	corrected AGC for ku band: l1b_echo_sar_ku mode		sl	time_l1b_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
comment	AGC corrected for instrumental errors - value the closest in time to the reference measurement			1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_echo_sar_ku lat_l1b_echo_sar_ku			1
scale_factor_ku_l1b_echo_sar_ku	scaling factor for sigma0 evaluation for ku band: l1b_echo_sar_ku mode		sl	time_l1b_echo_sar_ku

scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
comment	scaling factor corrected for AGC instrumental errors and internal calibration			1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_echo_sar_ku lat_l1b_echo_sar_ku			1
agc_cor_ku_l1b_echo_sar_ku	correction for instrumental errors on AGC for ku band: l1b_echo_sar_ku mode		sl	time_l1b_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
comment	value the closest in time to the reference measurement			1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_echo_sar_ku lat_l1b_echo_sar_ku			1
sig0_cal_ku_l1b_echo_sar_ku	internal calibration correction on Sigma0 for ku band: l1b_echo_sar_ku mode		sl	time_l1b_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_echo_sar_ku lat_l1b_echo_sar_ku			1
nb_stack_l1b_echo_sar_ku	number of waveforms summed in stack : l1b_echo_sar_ku mode		us	time_l1b_echo_sar_ku
units	Unit name	count		1
_FillValue	Default value for unused or not computed elements	65535		1
max_stack_l1b_echo_sar_ku	maximum power of stack : l1b_echo_sar_ku mode		ul	time_l1b_echo_sar_ku
units	Unit name	FFT power unit		1

_FillValue	Default value for unused or not computed elements	4294967295		1
coordinates	lon_l1b_echo_sar_ku lat_l1b_echo_sar_ku			1
stdev_stack_l1b_echo_sar_ku	standard deviation of stack : l1b_echo_sar_ku mode		ul	time_l1b_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-06		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	rad		1
_FillValue	Default value for unused or not computed elements	4294967295		1
coordinates	lon_l1b_echo_sar_ku lat_l1b_echo_sar_ku			1
skew_stack_l1b_echo_sar_ku	skewness of stack : l1b_echo_sar_ku mode		sl	time_l1b_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-06		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	count		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_echo_sar_ku lat_l1b_echo_sar_ku			1
kurt_stack_l1b_echo_sar_ku	kurtosis of stack : l1b_echo_sar_ku mode		sl	time_l1b_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-06		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	count		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_echo_sar_ku lat_l1b_echo_sar_ku			1
beam_ang_stack_l1b_echo_sar_ku	look angles in stack: l1b_echo_sar_ku mode		ss	time_l1b_echo_sar_ku max_multi_stack_ind
comment	Look angles in stack: l1b_echo_sar_ku mode. These are looking angles and not beam angles. The useful values of the table are the first n_useful values where n_useful is the number of waveforms summed in stack (nb_stack_l1b_echo_sar_ku)			1
scale_factor	The data must be multiplied by this factor after reading	1.00e-06		1

add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	rad		1
_FillValue	Default value for unused or not computed elements	32767		1
coordinates	lon_l1b_echo_sar_ku lat_l1b_echo_sar_ku			1
beam_form_l1b_echo_sar_ku	flag on beam formation quality in stack : l1b_echo_sar_ku mode		us	time_l1b_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	percent		1
_FillValue	Default value for unused or not computed elements	65535		1
coordinates	lon_l1b_echo_sar_ku lat_l1b_echo_sar_ku			1
i2q2_meas_ku_l1b_echo_sar_ku	multilooked I2+Q2 measurement for ku band : l1b_echo_sar_ku mode		ul	time_l1b_echo_sar_ku echo_sample_ind
comment	the echo is corrected for Doppler range effect, phase/power burst calibration and GPRW effect . the echo is scaled using the corrected AGC (agc ku_l1b_echo_sar_ku)			1
scale_factor	The data must be multiplied by this factor after reading	1.00e-03		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	count		1
_FillValue	Default value for unused or not computed elements	4294967295		1

Table 5-5: Content of the Level 1B measurement data file (SR_1_SRA___ product) : ECHO_SAR_Ku parameters

5.1.1.4.3 ECHO_PLRM

The Echo SAR_PLRM content is reported in the table below:

Element name	Description	Range or value	T	D
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time_l1b_echo_plrm	UTC : l1b_echo_plrm mode		D	time_l1b_echo_plrm
standard_name	Name of the physical quantity following the NetCDF Climate and Forecast (CF) Metadata Conventions	time		1
calendar		gregorian		1
units	Unit name	seconds since 2000-01-01 00:00:00.0		1
UTC_day_l1b_echo_plrm	day UTC : l1b_echo_plrm mode		ss	time_l1b_echo_plrm
units	Unit name	days since 2000-01-01 00:00:00.0		1
_FillValue	Default value for unused or not computed elements	32767		1
UTC_sec_l1b_echo_plrm	seconds in the day UTC : l1b_echo_plrm mode		D	time_l1b_echo_plrm
units	Unit name	s		1
_FillValue	Default value for unused or not computed elements	18446744073709551616		1
GPS_time_l1b_echo_plrm	GPS time : l1b_echo_plrm mode		D	time_l1b_echo_plrm
calendar		gregorian		1
units	Unit name	seconds since 1980-01-06 00:00:00.0		1
_FillValue	Default value for unused or not computed elements	18446744073709551616		1
isp_coarse_time_l1b_echo_plrm	ISP coarse time : l1b_echo_plrm mode		ul	time_l1b_echo_plrm
units	Unit name	second		1
_FillValue	Default value for unused or not computed elements	4294967295		1
isp_fine_time_l1b_echo_plrm	ISP fine time : l1b_echo_plrm mode		sl	time_l1b_echo_plrm
units	Unit name	2 ⁻²⁴ second		1
_FillValue	Default value for unused or not computed elements	2147483647		1
sral_fine_time_l1b_echo_plrm	ISP SRAL fine datation : l1b_echo_plrm mode		ul	time_l1b_echo_plrm
units	Unit name	137.5*10 ⁻⁹ second		1
_FillValue	Default value for unused or not computed elements	4294967295		1
lat_l1b_echo_plrm	latitude : l1b_echo_plrm mode		sl	time_l1b_echo_plrm
standard_name	Name of the physical quantity following the NetCDF Climate and Forecast (CF) Metadata Conventions	latitude		1
scale_factor	The data must be multiplied by this factor after reading	1.00e-06		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	degrees_north		1
_FillValue	Default value for unused or not computed elements	2147483647		1
lon_l1b_echo_plrm	longitude : l1b_echo_plrm mode		sl	time_l1b_echo_plrm
standard_name	Name of the physical quantity following the NetCDF Climate and Forecast (CF) Metadata Conventions	longitude		1

scale_factor	The data must be multiplied by this factor after reading	1.00e-06		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	degrees_east		1
_FillValue	Default value for unused or not computed elements	2147483647		1
alt_l1b_echo_plrm	altitude of satellite : l1b_echo_plrm mode		sl	time_l1b_echo_plrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	700000.		1
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_echo_plrm lat_l1b_echo_plrm			1
orb_alt_rate_l1b_echo_plrm	orbital altitude rate : l1b_echo_plrm mode		ss	time_l1b_echo_plrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	m/s		1
_FillValue	Default value for unused or not computed elements	32767		1
coordinates	lon_l1b_echo_plrm lat_l1b_echo_plrm			1
flag_time_status_l1b_echo_plrm	time status flag : l1b_echo_plrm mode		sc	time_l1b_echo_plrm
flag_values	Flag values	0b, 1b		1
comment	flag indicating if the time is synchronized or not with GPS time			1
flag_meanings	Flag meanings	synchronization no_synchronization		1
coordinates	lon_l1b_echo_plrm lat_l1b_echo_plrm			1
flag_time_corr_val_l1b_echo_plrm	time correlation validity flag : l1b_echo_plrm mode		sc	time_l1b_echo_plrm
flag_values	Flag values	0b, 1b, 2b		1
comment	flag indicating if the time correlation information is valid provided by OBSW, valid provided by Ground Segment or invalid			1
flag_meanings	Flag meanings	valid_obsw valid_ground_segment invalid		1
coordinates	lon_l1b_echo_plrm lat_l1b_echo_plrm			1
flag_man_pres_l1b_echo_plrm	manoeuvre presence flag: l1b_echo_plrm mode		sc	time_l1b_echo_plrm
flag_values	Flag values	0b, 1b		1
flag_meanings	Flag meanings	no_manoeuvre ongoing_manoeuvre		1
coordinates	lon_l1b_echo_plrm lat_l1b_echo_plrm			1

flag_man_thrust_l1b_echo_plrm	manoeuvre thrust flag: l1b_echo_plrm mode		sc	time_l1b_echo_plrm
flag_values	Flag values	0b, 1b		1
flag_meanings	Flag meanings	no_thrust ongoing_thrust		1
coordinates	lon_l1b_echo_plrm lat_l1b_echo_plrm			1
flag_man_plane_l1b_echo_plrm	manoeuvre plane flag: l1b_echo_plrm mode		sc	time_l1b_echo_plrm
flag_values	Flag values	0b, 1b		1
flag_meanings	Flag meanings	in_plane out_of_plane		1
coordinates	lon_l1b_echo_plrm lat_l1b_echo_plrm			1
flag_gnss_status_l1b_echo_plrm	validity flag for the navigation message from the gnss receiver: l1b_echo_plrm mode		sc	time_l1b_echo_plrm
comment	indicating if the navigation message from the GNSS receiver is valid or not valid/available			1
flag_values	Flag values	0b, 1b		1
flag_meanings	Flag meanings	valid invalid_unavailable		1
coordinates	lon_l1b_echo_plrm lat_l1b_echo_plrm			1
x_pos_l1b_echo_plrm	satellite altitude - x component : l1b_echo_plrm mode		D	time_l1b_echo_plrm
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	18446744073709551616		1
y_pos_l1b_echo_plrm	satellite altitude - y component : l1b_echo_plrm mode		D	time_l1b_echo_plrm
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	18446744073709551616		1
z_pos_l1b_echo_plrm	satellite altitude - z component : l1b_echo_plrm mode		D	time_l1b_echo_plrm
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	18446744073709551616		1
x_vel_l1b_echo_plrm	satellite velocity - x component : l1b_echo_plrm mode		D	time_l1b_echo_plrm
units	Unit name	m/s		1
_FillValue	Default value for unused or not computed elements	18446744073709551616		1
y_vel_l1b_echo_plrm	satellite velocity - y component : l1b_echo_plrm mode		D	time_l1b_echo_plrm
units	Unit name	m/s		1
_FillValue	Default value for unused or not computed elements	18446744073709551616		1
z_vel_l1b_echo_plrm	satellite velocity - z component : l1b_echo_plrm mode		D	time_l1b_echo_plrm
units	Unit name	m/s		1

_FillValue	Default value for unused or not computed elements	18446744073709551616		1
nav_bul_status_l1b_echo_plrm	navigation bulletin status : l1b_echo_plrm mode		sc	time_l1b_echo_plrm
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	ok ko		1
coordinates	lon_l1b_echo_plrm lat_l1b_echo_plrm			1
nav_bul_source_l1b_echo_plrm	navigation bulletin source identifier : l1b_echo_plrm mode		sc	time_l1b_echo_plrm
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	gps doris		1
coordinates	lon_l1b_echo_plrm lat_l1b_echo_plrm			1
nav_bul_coarse_time_l1b_echo_plrm	navigation bulletin coarse time : l1b_echo_plrm mode		ul	time_l1b_echo_plrm
units	Unit name	second		1
_FillValue	Default value for unused or not computed elements	4294967295		1
nav_bul_fine_time_l1b_echo_plrm	navigation bulletin fine time : l1b_echo_plrm mode		ul	time_l1b_echo_plrm
units	Unit name	2^-24 second		1
_FillValue	Default value for unused or not computed elements	4294967295		1
seq_count_l1b_echo_plrm	sequence count : l1b_echo_plrm mode		us	time_l1b_echo_plrm
_FillValue	Default value for unused or not computed elements	65535		1
coordinates	lon_l1b_echo_plrm lat_l1b_echo_plrm			1
isp_time_status_l1b_echo_plrm	ISP time status : l1b_echo_plrm mode		sc	time_l1b_echo_plrm
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	SRAL_OBT_extrapolated SRAL_OBT_updated_with_SMU_OBT		1
coordinates	lon_l1b_echo_plrm lat_l1b_echo_plrm			1
oper_instr_l1b_echo_plrm	operating instrument : l1b_echo_plrm mode		sc	time_l1b_echo_plrm
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	A B		1
coordinates	lon_l1b_echo_plrm lat_l1b_echo_plrm			1

comment	Instrument A stands for SRAL Nominal and instrument B stands for SRAL Redundant			1
SAR_mode_l1b_echo_plrm	SAR mode identifier : l1b_echo_plrm mode		sc	time_l1b_echo_plrm
flag_values	Flag values	0b, 1b, 2b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	closed_loop open_loop open_loop_fixed_gain		1
coordinates	lon_l1b_echo_plrm lat_l1b_echo_plrm			1
cl_gain_l1b_echo_plrm	tracking configuration - closed loop gain : l1b_echo_plrm mode		sc	time_l1b_echo_plrm
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	Nominal_value Nominal_value_with_back-off		1
coordinates	lon_l1b_echo_plrm lat_l1b_echo_plrm			1
acq_stat_l1b_echo_plrm	tracking configuration - acquisition status : l1b_echo_plrm mode		sc	time_l1b_echo_plrm
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	no_acquisition acquisition		1
coordinates	lon_l1b_echo_plrm lat_l1b_echo_plrm			1
dem_eeprom_l1b_echo_plrm	tracking configuration - DEM EEPROM read access : l1b_echo_plrm mode		sc	time_l1b_echo_plrm
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	enabled disabled		1
coordinates	lon_l1b_echo_plrm lat_l1b_echo_plrm			1
weighting_l1b_echo_plrm	altimeter configuration - weighting function : l1b_echo_plrm mode		sc	time_l1b_echo_plrm
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	enabled disabled		1
coordinates	lon_l1b_echo_plrm lat_l1b_echo_plrm			1
loss_track_l1b_echo_plrm	loss of track criterion : l1b_echo_plrm mode		sc	time_l1b_echo_plrm
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1

flag_meanings	Flag meanings	normal loss_of_track		1
coordinates	lon_l1b_echo_plrm lat_l1b_echo_plrm			1
h0_nav_dem_l1b_echo_plrm	altitude command H0 computed with nav DEM : l1b_echo_plrm mode		ul	time_l1b_echo_plrm
units	Unit name	3.125/64*10 ⁻⁹ s		1
_FillValue	Default value for unused or not computed elements	4294967295		1
coordinates	lon_l1b_echo_plrm lat_l1b_echo_plrm			1
h0_applied_l1b_echo_plrm	applied altitude command H0 : l1b_echo_plrm mode		ul	time_l1b_echo_plrm
units	Unit name	3.125/64*10 ⁻⁹ s		1
_FillValue	Default value for unused or not computed elements	4294967295		1
coordinates	lon_l1b_echo_plrm lat_l1b_echo_plrm			1
cor2_nav_dem_l1b_echo_plrm	altitude command COR2 computed with nav DEM : l1b_echo_plrm mode		ss	time_l1b_echo_plrm
units	Unit name	3.125/1024 10 ⁻⁹ s		1
_FillValue	Default value for unused or not computed elements	32767		1
coordinates	lon_l1b_echo_plrm lat_l1b_echo_plrm			1
cor2_applied_l1b_echo_plrm	applied altitude command COR2 : l1b_echo_plrm mode		ss	time_l1b_echo_plrm
units	Unit name	3.125/1024*10 ⁻⁹ s		1
_FillValue	Default value for unused or not computed elements	32767		1
coordinates	lon_l1b_echo_plrm lat_l1b_echo_plrm			1
dh0_l1b_echo_plrm	distance error computed on the echo of the cycle (N-2) in open loop mode (current cycle)		sl	time_l1b_echo_plrm
units	Unit name	3.125/64*10 ⁻⁹ s		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_echo_plrm lat_l1b_echo_plrm			1
agccode_ku_l1b_echo_plrm	AGCCODE for ku band : l1b_echo_plrm mode		sc	time_l1b_echo_plrm
units	Unit name	dB		1
_FillValue	Default value for unused or not computed elements	127		1
coordinates	lon_l1b_echo_plrm lat_l1b_echo_plrm			1
agccode_c_l1b_echo_plrm	AGCCODE for c band : l1b_echo_plrm mode		sc	time_l1b_echo_plrm
units	Unit name	dB		1
_FillValue	Default value for unused or not computed elements	127		1
coordinates	lon_l1b_echo_plrm lat_l1b_echo_plrm			1
surf_type_l1b_echo_plrm	altimeter surface type : l1b_echo_plrm mode		sc	time_l1b_echo_plrm

flag_values	Flag values	0b, 1b, 2b, 3b		1
flag_meanings	Flag meanings	open_ocean_or_semi-enclosed_seas enclosed_seas_or_lakes continental_ice land		1
coordinates	lon_l1b_echo_plrm lat_l1b_echo_plrm			1
range_ku_l1b_echo_plrm	corrected range for ku band : l1b_echo_plrm mode		sl	time_l1b_echo_plrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	700000.		1
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	2147483647		1
comment	tracker range corrected for USO frequency drift, internal path and Doppler corrections			1
coordinates	lon_l1b_echo_plrm lat_l1b_echo_plrm			1
range_c_l1b_echo_plrm	corrected range for c band : l1b_echo_plrm mode		sl	time_l1b_echo_plrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	700000.		1
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	2147483647		1
comment	tracker range corrected for USO frequency drift, internal path and Doppler corrections			1
coordinates	lon_l1b_echo_plrm lat_l1b_echo_plrm			1
uso_cor_l1b_echo_plrm	USO frequency drift correction : l1b_echo_plrm mode		sl	time_l1b_echo_plrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_echo_plrm lat_l1b_echo_plrm			1
int_path_cor_ku_l1b_echo_plrm	internal path correction for ku band : l1b_echo_plrm mode		sl	time_l1b_echo_plrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_echo_plrm lat_l1b_echo_plrm			1

int_path_cor_c_l1b_echo_plrm	internal path correction for c band : l1b_echo_plrm mode		sl	time_l1b_echo_plrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_echo_plrm lat_l1b_echo_plrm			1
dop_cor_ku_l1b_echo_plrm	doppler correction for ku band : l1b_echo_plrm mode		sl	time_l1b_echo_plrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_echo_plrm lat_l1b_echo_plrm			1
dop_cor_c_l1b_echo_plrm	doppler correction for c band : l1b_echo_plrm mode		sl	time_l1b_echo_plrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_echo_plrm lat_l1b_echo_plrm			1
range_rate_l1b_echo_plrm	range rate : l1b_echo_plrm mode		sl	time_l1b_echo_plrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-03		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	m/s		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_echo_plrm lat_l1b_echo_plrm			1
agc_ku_l1b_echo_plrm	corrected AGC for ku band: l1b_echo_plrm mode		sl	time_l1b_echo_plrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
comment	AGC corrected for instrumental errors			1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_echo_plrm lat_l1b_echo_plrm			1
agc_c_l1b_echo_plrm	corrected AGC for c band: l1b_echo_plrm mode		sl	time_l1b_echo_plrm

scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
comment	AGC corrected for instrumental errors			1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_echo_plrm lat_l1b_echo_plrm			1
scale_factor_ku_l1b_echo_plrm	scaling factor for sigma0 evaluation for ku band: l1b_echo_plrm mode		sl	time_l1b_echo_plrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
comment	scaling factor corrected for AGC instrumental errors and internal calibration			1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_echo_plrm lat_l1b_echo_plrm			1
scale_factor_c_l1b_echo_plrm	scaling factor for sigma0 evaluation for c band: l1b_echo_plrm mode		sl	time_l1b_echo_plrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
comment	scaling factor corrected for AGC instrumental errors and internal calibration			1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_echo_plrm lat_l1b_echo_plrm			1
agc_cor_ku_l1b_echo_plrm	correction for instrumental errors on AGC for ku band: l1b_echo_plrm mode		sl	time_l1b_echo_plrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_echo_plrm lat_l1b_echo_plrm			1
agc_cor_c_l1b_echo_plrm	correction for instrumental errors on AGC for c band: l1b_echo_plrm mode		sl	time_l1b_echo_plrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
_FillValue	Default value for unused or not computed elements	2147483647		1

coordinates	lon_l1b_echo_plrm lat_l1b_echo_plrm			1
sig0_cal_ku_l1b_echo_plrm	internal calibration correction on Sigma0 for ku band: l1b_echo_plrm mode		sl	time_l1b_echo_plrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_echo_plrm lat_l1b_echo_plrm			1
sig0_cal_c_l1b_echo_plrm	internal calibration correction on Sigma0 for c band: l1b_echo_plrm mode		sl	time_l1b_echo_plrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_echo_plrm lat_l1b_echo_plrm			1
i2q2_meas_ku_l1b_echo_plrm	I2+Q2 measurement for ku band : l1b_echo_plrm mode		ul	time_l1b_echo_plrm echo_sample_ind
scale_factor	The data must be multiplied by this factor after reading	1.00e-03		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
comment	the echo is the so-called ku-band averaged echo, corrected for the GPRW effect			1
_FillValue	Default value for unused or not computed elements	4294967295		1
i2q2_meas_c_l1b_echo_plrm	I2+Q2 measurement for c band : l1b_echo_plrm mode		ul	time_l1b_echo_plrm echo_sample_ind
scale_factor	The data must be multiplied by this factor after reading	1.00e-03		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
comment	the echo is the so-called c-band averaged echo, corrected for the GPRW effect			1
_FillValue	Default value for unused or not computed elements	4294967295		1

Table 5-6: Content of the Level 1B measurement data file (SR_1_SRA___ product) : ECHO_PLRM parameters

5.1.1.5 L1B Measurement Data Files: acquisition.nc

The content of the Level 1B SRAL product is described below:

Element name	Description	Range or value	T	D
time_l1b_acq	Number of L1B acquisition ISP telemetry			
<Specific global attributes>	:Conventions = netCDF convention :mission_name = Name of the mission :altimeter_sensor_name = Name of the altimeter sensor :gnss_sensor_name = Name of the GNSS sensor :doris_sensor_name = Name of the DORIS sensor :acq_station_name = Identification of the acquisition station :first_meas_time = UTC Date of the first measurement of the data set (YYYY-MM-DD HH:MM:SS.mmmmmm) :last_meas_time = UTC Date of the last measurement of the data set (YYYY-MM-DD HH:MM:SS.mmmmmm) :xref_altimeter_level0 = Name of the altimeter level 0 data file :xref_time_correlation = Name of the file containing the time correlation Data :xref_altimeter_orbit = Name of the file containing the Orbit Data :xref_doris_uso = Name of the file containing the DORIS-derived USO frequency :xref_altimeter_ltm_lrm_cal1 = Name of the LTM file containing the LRM mode CAL1 parameters :xref_altimeter_ltm_sar_cal1 = Name of the LTM file containing the SAR mode CAL1 parameters :xref_altimeter_ltm_ku_cal2 = Name of the LTM file containing the Ku-band CAL2 parameters :xref_altimeter_ltm_c_cal2 = Name of the LTM file containing the C-band CAL2 parameters :xref_altimeter_characterisation = Name of the altimeter characterisation data file :semi_major_ellipsoid_axis = Semi-major axis of the reference ellipsoid (meters) :ellipsoid_flattening = Flattening coefficient of the reference ellipsoid		S	
			ul D	

Table 5-7: Content of the Level 1B acquisition data file (SR_1_SRA___ product)

In addition to the 2 variables shown in the previous table, the Level 1B SRAL acquisition product contains the variables described in the following.

Element name	Description	Range or value	T	D
time_l1b_acq	UTC : l1b acquisition mode		D	time_l1b_acq
standard_name	Name of the physical quantity following the NetCDF Climate and Forecast (CF) Metadata Conventions	time		1
calendar		gregorian		1
units	Unit name	seconds since 2000-01-01 00:00:00.0		1
isp_coarse_time_l1b_acq	ISP coarse time : l1b_acq mode		ul	time_l1b_acq
units	Unit name	second		1
_FillValue	Default value for unused or not computed elements	4294967295		1
isp_fine_time_l1b_acq	ISP fine time : l1b_acq mode		sl	time_l1b_acq
units	Unit name	2 [^] 24 second		1
_FillValue	Default value for unused or not computed elements	2147483647		1
sral_fine_time_l1b_acq	ISP SRAL fine datation : l1b_acq mode		ul	time_l1b_acq
units	Unit name	137.5*10 [^] 9 second		1
_FillValue	Default value for unused or not computed elements	4294967295		1
lat_l1b_acq	latitude : l1b_acq mode		sl	time_l1b_acq
standard_name	Name of the physical quantity following the NetCDF Climate and Forecast (CF) Metadata Conventions	latitude		1
scale_factor	The data must be multiplied by this factor after reading	1.00e-06		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	degrees_north		1
_FillValue	Default value for unused or not computed elements	2147483647		1
lon_l1b_acq	longitude : l1b_acq mode		sl	time_l1b_acq
standard_name	Name of the physical quantity following the NetCDF Climate and Forecast (CF) Metadata Conventions	longitude		1
scale_factor	The data must be multiplied by this factor after reading	1.00e-06		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	degrees_east		1
_FillValue	Default value for unused or not computed elements	2147483647		1
alt_l1b_acq	altitude of satellite : l1b_acq mode		sl	time_l1b_acq
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	700000.		1
units	Unit name	m		1

_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_acq lat_l1b_acq			1
orb_alt_rate_l1b_acq	orbital altitude rate : l1b_acq mode		ss	time_l1b_acq
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	m/s		1
_FillValue	Default value for unused or not computed elements	32767		1
coordinates	lon_l1b_acq lat_l1b_acq			1
surf_type_l1b_acq	altimeter surface type : l1b_acq mode		sc	time_l1b_acq
flag_values	Flag values	0b, 1b, 2b, 3b		1
flag_meanings	Flag meanings	open_ocean_or_semi-enclosed_seas enclosed_seas_or_lakes continental_ice land		1
coordinates	lon_l1b_acq lat_l1b_acq			1
flag_positioning_phase_acq	positioning phase indicator : l1b_acq mode		sc	time_l1b_acq
flag_values	Flag values	0b, 1b		1
flag_meanings	Flag meanings	Success Failure		1
coordinates	lon_l1b_acq lat_l1b_acq			1
flag_search_phase_acq	search phase indicator : l1b_acq mode		sc	time_l1b_acq
flag_values	Flag values	0b, 1b		1
flag_meanings	Flag meanings	Success Failure		1
coordinates	lon_l1b_acq lat_l1b_acq			1
positioning_phase_acq_valid_cycles_ind	number of valid cycles of the positioning phase		sc	time_l1b_acq
units	Unit name	count		1
comment	Set to be compliant with the CF-1.6 convention			1
flag_locking_phase_acq	locking phase indicator : l1b_acq mode		sc	time_l1b_acq
flag_values	Flag values	0b, 1b		1
flag_meanings	Flag meanings	Success Failure		1
coordinates	lon_l1b_acq lat_l1b_acq			1
locking_phase_acq_valid_cycles_ind	number of valid cycles of the locking phase		sc	time_l1b_acq

units	Unit name	count		1
comment	Set to be compliant with the CF-1.6 convention			1

Table 5-8: Content of the Level 1B acquisition data file (SR_1_SRA___ product) : variables

5.1.2 SRAL “SR_1_SRA_A_”

A Level 1A SRAL product contains one "measurement data file" containing the L1A measurements parameters:

- ECHO_SAR_Ku: L1A Tracking measurements (sorted and calibrated) in SAR mode – Ku-band (80-Hz)
- ECHO_PLRM: L1A Tracking measurements (sorted and calibrated) in pseudo-LRM mode – Ku and C bands (80-Hz)

5.1.2.1 Product summary

SR_1_SRA_		Description L1A Echos parameters for SAR mode			
Product Level	Diss. Timeliness	Product Category	Application Domain		Spatial Resolution
1	(STC/NTC)	Not Available to the user			
Product Dissemination Unit N/A		Number of Package components	Number of Measurement Data Files	Number of Annotation Data Files	Number of Representation Information Files
		3 ²	1	0	0
Product Package Structure					
Manifest file (see section 5.1.1.2 for more details)					
File name			Composition		
xfdumanifest.xml					
Measurement Data files (see section 5.1.1 for more details)					N.O.
File name			Composition		
Measurement_l1a.nc			L1A Tracking measurements (sorted and calibrated): ECHO_SAR_Ku, ECHO_PLRM		
Annotation Data files					N.O.
File name			Composition		
none					
Representation Information Files					N.O.
File name			Composition		
none					

Table 5-9: SRAL Measurement Level 1A product physical composition

5.1.2.2 Manifest File

The structure of the Manifest element is described in [AD- 2].

5.1.2.3 Product Metadata

According to [AD- 2], Wrapped Metadata are grouped in Primary Metadata, common to all Sentinel 3 products and Secondary Metadata, specific for instrument and processing level.

Primary Metadata are described in [AD- 2].

Secondary Metadata for the SRAL instrument are reported in Table 5-2. Last columns of the table indicate the applicability of Metadata fields to the processing Level.

< Complete secondary metadata is described in details in [AD- 4].

² Number of Package components includes the manifest and the OLQC Report.

The content of this table will be embedded in the document when it will be finalized>

Table 5-10: Secondary Metadata for SR_1_SRA_A_ products

5.1.2.4 L1A Measurement Data Files

The content of the Level 1A SRAL product is described below:

Element name	Description	Range or value	T	D
time_l1a_echo_sar_ku	Number of L1a ECHO_SAR_Ku measurements			
time_l1a_echo_plrm	Number of L1a ECHO_PLRM measurements			
echo_sample_ind	Number of samples in a waveform	128		
sar_ku_pulse_burst_ind	Number of Ku-pulses per burst	64		
sar_c_pulse_cycle_ind	Number of C-pulses per burst	2		
ltm_max_ind	Maximum number of LTM Cal1 or Cal2 tables	3		
<Specific global attributes>	:Conventions = netCDF convention :mission_name = Name of the mission :altimeter_sensor_name = Name of the altimeter sensor :gnss_sensor_name = Name of the GNSS sensor :doris_sensor_name = Name of the DORIS sensor :acq_station_name = Identification of the acquisition station :first_meas_time = UTC Date of the first measurement of the data set (YYYY-MM-DD HH:MM:SS.mmmmmm) :last_meas_time = UTC Date of the last measurement of the data set (YYYY-MM-DD HH:MM:SS.mmmmmm) :xref_altimeter_level0 = Name of the altimeter level 0 data file :xref_time_correlation = Name of the file containing the time correlation :xref_altimeter_orbit = Name of the file containing the Orbit Data :xref_doris_uso = Name of the file containing the DORIS-derived USO frequency :xref_altimeter_ltm_lrm_cal1 = Name of the LTM file containing the LRM mode CAL1 parameters :xref_altimeter_ltm_sar_cal1 = Name of the LTM file containing the SAR mode CAL1 parameters :xref_altimeter_ltm_ku_cal2 = Name of the LTM file containing the Ku-band CAL2 parameters :xref_altimeter_ltm_c_cal2 = Name of the LTM file containing the C-band CAL2 parameters :xref_altimeter_characterisation = Name of the altimeter characterisation data file :semi_major_ellipsoid_axis = Semi-major axis of the reference ellipsoid (meters) :ellipsoid_flattening = Flattening coefficient of the reference ellipsoid		S	
			ul	

			D	
echo_sample_ind	number of samples in I2+Q2, I and Q echoes		sc	echo_sample_ind
units	Unit name	count		1
comment	Set to be compliant with the CF-1.6 convention			1
sar_ku_pulse_burst_ind	number of Ku-band pulses per burst in SAR mode		sc	sar_ku_pulse_burst_ind
units	Unit name	count		1
comment	Set to be compliant with the CF-1.6 convention			1
sar_c_pulse_burst_ind	number of C-band pulses per burst in SAR mode		sc	sar_c_pulse_burst_ind
units	Unit name	count		1
comment	Set to be compliant with the CF-1.6 convention			1
ltm_max_ind	maximum number of LTM Cal1 or Cal2 tables		sc	ltm_max_ind
units	Unit name	count		1
comment	Set to be compliant with the CF-1.6 convention			1

Table 5-11: Content of the Level 1A measurement data file (SR_1_SRA_A_product)

In addition to the 4 variables shown in the previous table, the Level 1A SRAL product contains the variables described in sections 5.1.2.4.1 and 5.1.2.4.2

5.1.2.4.1 ECHO_SAR_Ku

The Echo SAR_Ku content is reported in the table below:

time_l1a_echo_sar_ku	UTC : l1a_echo_sar_ku mode		D	time_l1a_echo_sar_ku
standard_name	Name of the physical quantity following the NetCDF Climate and Forecast (CF) Metadata Conventions	time		1
calendar		gregorian		1
units	Unit name	seconds since 2000-01-01 00:00:00.0		1
UTC_day_l1a_echo_sar_ku	day UTC : l1a_echo_sar_ku mode		ss	time_l1a_echo_sar_ku
units	Unit name	days since 2000-01-01 00:00:00.0		1
_FillValue	Default value for unused or not computed elements	32767s		1
UTC_sec_l1a_echo_sar_ku	seconds in the day UTC : l1a_echo_sar_ku mode		D	time_l1a_echo_sar_ku
units	Unit name	s		1

_FillValue	Default value for unused or not computed elements	1.84467440737096e+19		1
UTC_time_20hz_l1a_echo_sar_ku	UTC of the 20 Hz measurement		D	time_l1a_echo_sar_ku
units	Unit name	seconds since 2000-01-01 00:00:00.0		1
calendar	Reference Time Calendar	gregorian		1
Comment	Value of L1b 20 Hz UTC time the closest in time to the reference measurement			1
isp_coarse_time_l1a_echo_sar_ku	ISP coarse time : l1a_echo_sar_ku mode		ul	time_l1a_echo_sar_ku
units	Unit name	second		1
_FillValue	Default value for unused or not computed elements	4294967295U		1
isp_fine_time_l1a_echo_sar_ku	ISP fine time : l1a_echo_sar_ku mode		sl	time_l1a_echo_sar_ku
units	Unit name	2 [^] -24 second		1
_FillValue	Default value for unused or not computed elements	2147483647		1
flag_time_status_l1a_echo_sar_ku	time status flag : l1a_echo_sar_ku mode		sc	time_l1a_echo_sar_ku
flag_values	Flag values	0b, 1b		1
flag_meanings	Flag meanings	synchronization no_synchronization		1
coordinates	lon_l1a_echo_sar_ku lat_l1a_echo_sar_ku			1
_FillValue	Default value for unused or not computed elements	127b		1
comment	flag indicating if the time is synchronized or not with GPS time			1
srsl_fine_time_l1a_echo_sar_ku	ISP SRAL fine datation : l1a_echo_sar_ku mode		ul	time_l1a_echo_sar_ku
units	Unit name	137.5*10 ^{^-9} second		1
_FillValue	Default value for unused or not computed elements	4294967295U		1
lat_l1a_echo_sar_ku	latitude : l1a_echo_sar_ku mode		sl	time_l1a_echo_sar_ku
standard_name	Name of the physical quantity following the NetCDF Climate and Forecast (CF) Metadata Conventions	latitude		1
scale_factor	The data must be multiplied by this factor after reading	1.e-06		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.		1
units	Unit name	degrees_north		1
_FillValue	Default value for unused or not computed elements	2147483647		1
lon_l1a_echo_sar_ku	longitude : l1a_echo_sar_ku mode		sl	time_l1a_echo_sar_ku
standard_name	Name of the physical quantity following the NetCDF Climate and Forecast (CF) Metadata Conventions	longitude		1
scale_factor	The data must be multiplied by this factor after reading	1.e-06		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.		1

units	Unit name	degrees_east		1
_FillValue	Default value for unused or not computed elements	2147483647		1
surf_type_l1a_echo_sar_ku	altimeter surface type : l1a_echo_sar_ku mode		sc	time_l1a_echo_sar_ku
flag_values	Flag values	0b, 1b, 2b, 3b		1
flag_meanings	Flag meanings	open_ocean_or_semi- enclosed_seas enclosed_seas_or_lakes continental_ice land		1
_FillValue	Default value for unused or not computed elements	127b		1
coordinates	lon_l1a_echo_sar_ku lat_l1a_echo_sar_ku			1
burst_count_prod_l1a_echo_sar_ku	bursts counter within the product : l1a_echo_sar_ku mode		sl	time_l1a_echo_sar_ku
units	Unit name	count		1
comment	range 1 to number of records in the product			1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1a_echo_sar_ku lat_l1a_echo_sar_ku			1
seq_count_l1a_echo_sar_ku	Source sequence count : l1a_echo_sar_ku mode		us	time_l1a_echo_sar_ku
units	Unit name	count		1
_FillValue	Default value for unused or not computed elements	65535		1
coordinates	lon_l1a_echo_sar_ku lat_l1a_echo_sar_ku			1
burst_count_cycle_l1a_echo_sar_ku	bursts counter within the tracking cycle : l1a_echo_sar_ku mode		sc	time_l1a_echo_sar_ku
units	Unit name	count		1
_FillValue	Default value for unused or not computed elements	127b		1
coordinates	lon_l1a_echo_sar_ku lat_l1a_echo_sar_ku			1
nav_bul_status_l1a_echo_sar_ku	navigation bulletin status : l1a_echo_sar_ku mode		sc	time_l1a_echo_sar_ku
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127b		1
flag_meanings	Flag meanings	ok ko		1
coordinates	lon_l1a_echo_sar_ku lat_l1a_echo_sar_ku			1
nav_bul_source_l1a_echo_sar_ku	navigation bulletin source identifier : l1a_echo_sar_ku mode		sc	time_l1a_echo_sar_ku
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127b		1
flag_meanings	Flag meanings	gps doris		1
coordinates	lon_l1a_echo_sar_ku lat_l1a_echo_sar_ku			1

oper_instr_l1a_echo_sar_ku	operating instrument : l1a_echo_sar_ku mode		sc	time_l1a_echo_sar_ku
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127b		1
flag_meanings	Flag meanings	A B		1
coordinates	lon_l1a_echo_sar_ku lat_l1a_echo_sar_ku			1
SAR_mode_l1a_echo_sar_ku	SAR mode identifier : l1a_echo_sar_ku mode		sc	time_l1a_echo_sar_ku
flag_values	Flag values	0b, 1b, 2b		1
_FillValue	Default value for unused or not computed elements	127b		1
flag_meanings	Flag meanings	closed_loop open_loop open_loop_fixed_gain		1
coordinates	lon_l1a_echo_sar_ku lat_l1a_echo_sar_ku			1
cl_gain_l1a_echo_sar_ku	tracking configuration - closed loop gain : l1a_echo_sar_ku mode		sc	time_l1a_echo_sar_ku
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127b		1
flag_meanings	Flag meanings	Nominal_value Nominal_value_with _back-off		1
coordinates	lon_l1a_echo_sar_ku lat_l1a_echo_sar_ku			1
acq_stat_l1a_echo_sar_ku	tracking configuration - acquisition status : l1a_echo_sar_ku mode		sc	time_l1a_echo_sar_ku
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127b		1
flag_meanings	Flag meanings	no_acquisition acquisition		1
coordinates	lon_l0_echo_sar_ku lat_l0_echo_sar_ku			1
dem_eeprom_l0_echo_sar_ku	tracking configuration - DEM EEPROM read access : l0_echo_sar_ku mode		sc	time_l1a_echo_sar_ku
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127b		1
flag_meanings	Flag meanings	enabled disabled		1
coordinates	lon_l0_echo_sar_ku lat_l0_echo_sar_ku			1
weighting_l1a_echo_sar_ku	altimeter configuration - weighting function : l1a_echo_sar_ku mode		sc	time_l1a_echo_sar_ku
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127b		1
flag_meanings	Flag meanings	enabled disabled		1
coordinates	lon_l1a_echo_sar_ku lat_l1a_echo_sar_ku			1
loss_track_l1a_echo_sar_ku	loss of track criterion : l1a_echo_sar_ku mode		sc	time_l1a_echo_sar_ku

flag_values	Flag values	0b, 1b		1
flag_meanings	Flag meanings	normal loss_of_track		1
coordinates	lon_l1a_echo_sar_ku lat_l1a_echo_sar_ku			1
_FillValue	Default value for unused or not computed elements	127b		1
h0_nav_dem_l1a_echo_sar_ku	altitude command H0 computed with nav DEM : l1a_echo_sar_ku mode		ul	time_l1a_echo_sar_ku
units	Unit name	3.125/64*10 ⁻⁹ s		1
_FillValue	Default value for unused or not computed elements	4294967295U		1
coordinates	lon_l1a_echo_sar_ku lat_l1a_echo_sar_ku			1
h0_applied_l1a_echo_sar_ku	applied altitude command H0 : l1a_echo_sar_ku mode		ul	time_l1a_echo_sar_ku
units	Unit name	3.125/64*10 ⁻⁹ s		1
_FillValue	Default value for unused or not computed elements	4294967295U		1
coordinates	lon_l1a_echo_sar_ku lat_l1a_echo_sar_ku			1
cor2_nav_dem_l1a_echo_sar_ku	altitude command COR2 computed with nav DEM : l1a_echo_sar_ku mode		ss	time_l1a_echo_sar_ku
units	Unit name	3.125/1024 10 ⁻⁹ s		1
_FillValue	Default value for unused or not computed elements	32767s		1
coordinates	lon_l1a_echo_sar_ku lat_l1a_echo_sar_ku			1
cor2_applied_l1a_echo_sar_ku	applied altitude command COR2 : l1a_echo_sar_ku mode		ss	time_l1a_echo_sar_ku
units	Unit name	3.125/1024*10 ⁻⁹ s		1
_FillValue	Default value for unused or not computed elements	32767s		1
coordinates	lon_l1a_echo_sar_ku lat_l1a_echo_sar_ku			1
dh0_l1a_echo_sar_ku	distance error computed on the echo of the cycle (N-2) in open loop mode		sl	time_l1a_echo_sar_ku
units	Unit name	3.125/64*10 ⁻⁹ s		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1a_echo_sar_ku lat_l1a_echo_sar_ku			1
agccode_ku_l1a_echo_sar_ku	AGCCODE for ku band : l1a_echo_sar_ku mode		sc	time_l1a_echo_sar_ku
units	Unit name	dB		1
_FillValue	Default value for unused or not computed elements	127b		1
coordinates	lon_l1a_echo_sar_ku lat_l1a_echo_sar_ku			1
agccode_c_l1a_echo_sar_ku	AGCCODE for c band : l1a_echo_sar_ku mode		sc	time_l1a_echo_sar_ku
units	Unit name	dB		1
_FillValue	Default value for unused or not computed elements	127b		1
coordinates	lon_l1a_echo_sar_ku lat_l1a_echo_sar_ku			1

alt_l1a_echo_sar_ku	altitude of satellite : l1a_echo_sar_ku mode		sl	time_l1a_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	700000.		1
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1a_echo_sar_ku lat_l1a_echo_sar_ku			1
comment	Altitude of the center of mass of the satellite			1
orb_alt_rate_l1a_echo_sar_ku	orbital altitude rate : l1a_echo_sar_ku mode		ss	time_l1a_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	m/s		1
_FillValue	Default value for unused or not computed elements	32767		1
coordinates	lon_l1a_echo_sar_ku lat_l1a_echo_sar_ku			1
x_pos_l1a_echo_sar_ku	satellite altitude - x component : l1a_echo_sar_ku mode		D	time_l1a_echo_sar_ku
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	18446744073709551616		1
y_pos_l1a_echo_sar_ku	satellite altitude - y component : l1a_echo_sar_ku mode		D	time_l1a_echo_sar_ku
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	18446744073709551616		1
z_pos_l1a_echo_sar_ku	satellite altitude - z component : l1a_echo_sar_ku mode		D	time_l1a_echo_sar_ku
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	18446744073709551616		1
x_vel_l1a_echo_sar_ku	satellite velocity - x component : l1a_echo_sar_ku mode		D	time_l1a_echo_sar_ku
units	Unit name	m/s		1
_FillValue	Default value for unused or not computed elements	18446744073709551616		1
y_vel_l1a_echo_sar_ku	satellite velocity - y component : l1a_echo_sar_ku mode		D	time_l1a_echo_sar_ku
units	Unit name	m/s		1
_FillValue	Default value for unused or not computed elements	18446744073709551616		1
z_vel_l1a_echo_sar_ku	satellite velocity - z component : l1a_echo_sar_ku mode		D	time_l1a_echo_sar_ku
units	Unit name	m/s		1
_FillValue	Default value for unused or not computed elements	18446744073709551616		1
roll_sat_pointing_l1a_echo_sar_ku	satellite pointing angle - roll : l1a_echo_sar_ku mode		sl	time_l1a_echo_sar_ku

scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	degrees		1
_FillValue	Default value for unused or not computed elements	2147483647		1
comment	value for the closest in time from the burst time tag, given in the nadir pointing reference frame			1
coordinates	lon_l1a_echo_sar_ku lat_l1a_echo_sar_ku			1
pitch_sat_pointing_l1a_echo_sar_ku	satellite pointing angle - pitch : l1a_echo_sar_ku mode		sl	time_l1a_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	degrees		1
_FillValue	Default value for unused or not computed elements	2147483647		1
comment	value for the closest in time from the burst time tag, given in the nadir pointing reference frame			1
coordinates	lon_l1a_echo_sar_ku lat_l1a_echo_sar_ku			1
yaw_sat_pointing_l1a_echo_sar_ku	satellite pointing angle - yaw : l1a_echo_sar_ku mode		sl	time_l1a_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	degrees		1
_FillValue	Default value for unused or not computed elements	2147483647		1
comment	value for the closest in time from the burst time tag, given in the nadir pointing reference frame			1
coordinates	lon_l1a_echo_sar_ku lat_l1a_echo_sar_ku			1
roll_sral_mispointing_l1a_echo_sar_ku	SRAL mispointing angle - roll : l1a_echo_sar_ku mode		sl	time_l1a_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	degrees		1
_FillValue	Default value for unused or not computed elements	2147483647		1
comment	value for the closest in time from the burst time tag, given in the nadir pointing reference frame			1
coordinates	lon_l1a_echo_sar_ku lat_l1a_echo_sar_ku			1
pitch_sral_mispointing_l1a_echo_sar_ku	SRAL mispointing angle - pitch : l1a_echo_sar_ku mode		sl	time_l1a_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	degrees		1
_FillValue	Default value for unused or not computed elements	2147483647		1

comment	value for the closest in time from the burst time tag, given in the nadir pointing reference frame			1
coordinates	lon_l1a_echo_sar_ku lat_l1a_echo_sar_ku			1
yaw_sral_mispointing_l1a_echo_sar_ku	SRAL mispointing angle - yaw : l1a_echo_sar_ku mode		sl	time_l1a_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	degrees		1
_FillValue	Default value for unused or not computed elements	2147483647		1
comment	value for the closest in time from the burst time tag, given in the nadir pointing reference frame			1
coordinates	lon_l1a_echo_sar_ku lat_l1a_echo_sar_ku			1
range_ku_l1a_echo_sar_ku	corrected range for ku band : l1a_echo_sar_ku mode		sl	time_l1a_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	700000.		1
units	Unit name	m		1
comment	Distance between the altimeter reference point and the surface height associated to a range gate used as reference inside the tracking window (reference tracking point), corrected for USO frequency drift and internal path correction			1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1a_echo_sar_ku lat_l1a_echo_sar_ku			1
int_path_cor_ku_l1a_echo_sar_ku	internal path correction for ku band : l1a_echo_sar_ku mode		sl	time_l1a_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	m		1
comment	Value the closest in time from the burst time tag			1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1a_echo_sar_ku lat_l1a_echo_sar_ku			1
uso_cor_l1a_echo_sar_ku	USO frequency drift correction : l1a_echo_sar_ku mode		sl	time_l1a_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	2147483647		1
comment	Value the closest in time from the burst time tag			1
coordinates	lon_l1a_echo_sar_ku lat_l1a_echo_sar_ku			1
cog_cor_l1a_echo_sar_ku	Distance antenna-CoG correction : l1a_echo_sar_ku mode		ss	time_l1a_echo_sar_ku

scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	m		1
comment	Distance in the z-component between the centre of mass of the satellite and the altimeter antenna reference point			1
_FillValue	Default value for unused or not computed elements	32767s		1
coordinates	lon_l1a_echo_sar_ku lat_l1a_echo_sar_ku			1
agc_ku_l1a_echo_sar_ku	corrected AGC for ku band: l1a_echo_sar_ku mode		sl	time_l1a_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
comment	AGC corrected for instrumental errors (calibration)			1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_echo_sar_ku lat_l1b_echo_sar_ku			1
agc_c_l1a_echo_sar_ku	corrected AGC for c band: l1a_echo_sar_ku mode		sl	time_l1a_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
comment	AGC corrected for instrumental errors (calibration)			1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1a_echo_sar_ku lat_l1a_echo_sar_ku			1
scale_factor_ku_l1a_echo_sar_ku	scaling factor for sigma0 evaluation for ku band: l1a_echo_sar_ku mode		sl	time_l1a_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
comment	scaling factor corrected for AGC instrumental errors and internal calibration			1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1a_echo_sar_ku lat_l1a_echo_sar_ku			1
scale_factor_c_l1a_echo_sar_ku	scaling factor for sigma0 evaluation for c band: l1a_echo_sar_ku mode		sl	time_l1a_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
comment	scaling factor corrected for AGC instrumental errors and internal calibration			1

_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1a_echo_sar_ku lat_l1a_echo_sar_ku			1
sig0_cal_ku_l1a_echo_sar_ku	internal calibration correction on Sigma0 for ku band: l1a_echo_sar_ku mode		sl	time_l1a_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1a_echo_sar_ku lat_l1a_echo_sar_ku			1
sig0_cal_c_l1a_echo_sar_ku	internal calibration correction on Sigma0 for c band: l1a_echo_sar_ku mode		sl	time_l1a_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1a_echo_sar_ku lat_l1a_echo_sar_ku			1
i_meas_ku_l1a_echo_sar_ku	ku band echoes, i measurements : l1a_echo_sar_ku mode		sb	time_l1a_echo_sar_ku sar_ku_pulse_burst_ind echo_sample_ind
units	Unit name	count		1
_FillValue	Default value for unused or not computed elements	127s		1
comment	ku band echoes of a burst, i values (64*128 samples) in the time domain. The pulses are not corrected for AGC			1
coordinates	lon_l1a_echo_sar_ku lat_l1a_echo_sar_ku			1
q_meas_ku_l1a_echo_sar_ku	ku band echoes, q measurements: l1a_echo_sar_ku mode		sb	time_l1a_echo_sar_ku sar_ku_pulse_burst_ind echo_sample_ind
units	Unit name	count		1
_FillValue	Default value for unused or not computed elements	127s		1
comment	ku band echoes of a burst, q values (64*128 samples) in the time domain. The pulses are not corrected for AGC			1
coordinates	lon_l1a_echo_sar_ku lat_l1a_echo_sar_ku			1
i_meas_c_l1a_echo_sar_ku	c band echoes, i measurements : l1a_echo_sar_ku mode		sb	time_l1a_echo_sar_ku sar_c_pulse_burst_ind echo_sample_ind
units	Unit name	count		1
_FillValue	Default value for unused or not computed elements	127s		1
comment	c band echoes of a burst, i values (2*128 samples) in the time domain. The pulses are not			1

	corrected for AGC			
coordinates	lon_l1a_echo_sar_ku lat_l1a_echo_sar_ku			1
q_meas_c_l1a_echo_sar_ku	c band echoes, q measurements : l1a_echo_sar_ku mode		sb	time_l1a_echo_sar_ku sar_c_pulse_burst_ind echo_sample_ind
units	Unit name	count		1
_FillValue	Default value for unused or not computed elements	127s		1
comment	c band echoes of a burst, q values (2*128 samples) in the time domain. The pulses are not corrected for AGC			1
coordinates	lon_l1a_echo_sar_ku lat_l1a_echo_sar_ku			1
gprw_meas_ku_l1a_echo_sar_ku	ku band samples of the normalized GPRW (cal2) : l1a_echo_sar_ku mode		ul	time_l1a_echo_sar_ku ltm_max_ind echo_sample_ind
units	Unit name	FFT power unit		1
comment	Normalized GPRW waveform correction to be applied. The zero-frequency gate of the GPRW is at gate 63 (0-based indexing). The [ltm_max_ind] normalized GPRW provided for each measurement can be averaged for noise reduction purpose.			
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
_FillValue	Default value for unused or not computed elements	4294967295		1
coordinates	lon_l1a_echo_sar_ku lat_l1a_echo_sar_ku			1
gprw_meas_c_l1a_echo_sar_ku	c band samples of the normalized GPRW (cal2) : l1a_echo_sar_ku mode		ul	time_l1a_echo_sar_ku ltm_max_ind echo_sample_ind
units	Unit name	FFT power unit		1
comment	Normalized GPRW waveform correction to be applied. The zero-frequency gate of the GPRW is at gate 63 (0-based indexing). The [ltm_max_ind] normalized GPRW provided for each measurement can be averaged for noise reduction purpose.			
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
_FillValue	Default value for unused or not computed elements	4294967295		1
coordinates	lon_l1a_echo_sar_ku lat_l1a_echo_sar_ku			1
cal2_ku_ind_l1a_echo_sar_ku	Index of the cal2 ltm table (normalized GPRW) : l1a_echo_sar_ku mode		sc	time_l1a_echo_sar_ku
units	Unit name	count		1
comment	Set to default in the current issue			
_FillValue	Default value for unused or not computed elements	127b		1
coordinates	lon_l1a_echo_sar_ku lat_l1a_echo_sar_ku			1

burst_power_cor_ku_l1a_echo_sar_ku	ku band burst power corrections (cal1) : l1a_echo_sar_ku mode		ul	time_l1a_echo_sar_ku sar_ku_pulse_burst_ind
units	Unit name	FFT power unit		1
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
_FillValue	Default value for unused or not computed elements	4294967295		1
coordinates	lon_l1a_echo_sar_ku lat_l1a_echo_sar_ku			1
burst_phase_cor_ku_l1a_echo_sar_ku	ku band burst phase corrections (cal1) : l1a_echo_sar_ku mode		sl	time_l1a_echo_sar_ku sar_ku_pulse_burst_ind
units	Unit name	radian		1
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1a_echo_sar_ku lat_l1a_echo_sar_ku			1
cal1_ku_ind_l1a_echo_sar_ku	Index of the cal1 ltm tables (power and phase corrections) : l1a_echo_sar_ku mode		sc	time_l1a_echo_sar_ku
units	Unit name	count		1
comment	Set to default in the current issue			
_FillValue	Default value for unused or not computed elements	127b		1
coordinates	lon_l1a_echo_sar_ku lat_l1a_echo_sar_ku			1

Table 5-12: Content of the Level 1A measurement data file (SR_1_SRA_A_product) : ECHO_SAR_Ku parameter

5.1.2.4.2 ECHO_PLRM

The Echo PLRM content is reported in the table below:

time_l1a_echo_plrm	UTC : l1a_echo_plrm mode		D	time_l1a_echo_plrm
standard_name	Name of the physical quantity following the NetCDF Climate and Forecast (CF) Metadata Conventions	time		1
calendar		gregorian		1
units	Unit name	seconds since 2000-01-01 00:00:00.0		1
i2q2_meas_ku_l1a_echo_plrm	I2+Q2 measurement for ku band : l1a_echo_plrm mode		ul	time_l1a_echo_plrm echo_sample_ind
scale_factor	The data must be multiplied by this factor after reading	0.001		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.		1
units	Unit name	count		1
_FillValue	Default value for unused or not computed elements	4294967295		1
comment	Tracking echoes from on board tracker. For engineering analysis only			1
coordinates	lon_l1a_echo_plrm lat_l1a_echo_plrm			1
i2q2_meas_c_l1a_echo_plrm	I2+Q2 measurement for c band : l1a_echo_plrm mode		ul	time_l1a_echo_plrm echo_sample_ind
scale_factor	The data must be multiplied by this factor after reading	0.001		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.		1
units	Unit name	count		1
_FillValue	Default value for unused or not computed elements	4294967295		1
comment	Tracking echoes from on board tracker. For engineering analysis only			1
coordinates	lon_l1a_echo_plrm lat_l1a_echo_plrm			1

Table 5-13: Content of the Level 1A measurement data file (SR_1_SRA_A_product) : ECHO_PLRM parameter

5.1.3 SRAL “SR_1_SRA_BS”

A Level 1B-S SRAL product contains one "measurement data file" containing the L1b measurements parameters:

- ECHO_SAR_Ku : L1b Tracking measurements in SAR mode - Ku band (20-Hz) as defined in the L1b MEAS product completed with SAR expert information
- ECHO_PLRM : L1b Tracking measurements in pseudo-LRM mode – Ku and C bands (20-Hz) as defined in the L1b MEAS product.

5.1.3.1 Product summary

SR_1_SRA_		Description L1b-S Echos parameters for SAR mode			
Product Level	Diss. Timeliness	Product Category	ApplicationDomain		Spatial Resolution
1	(STC/NTC)	Not Available to the user			
Product Dissemination Unit N/A		Number of Package components	Number of Measurement Data Files	Number of Annotation Data Files	Number of Representation Information Files
		3 ³	1	0	0
Product Package Structure					
Manifest file (see section 5.1.1.2 for more details)					
File name			Composition		
xfdumanifest.xml					
Measurement Data files (see section 5.1.1 for more details)					N.O.
File name			Composition		
Measurement_l1bs.nc			L1b Tracking measurements: ECHO_SAR_Ku, ECHO_PLRM		
Annotation Data files					N.O.
File name			Composition		
none					
Representation Information Files					N.O.
File name			Composition		
none					

Table 5-14: SRAL Measurement Level 1B-S product physical composition

5.1.3.2 Manifest File

The structure of the Manifest element is described in [AD- 2].

5.1.3.3 Product Metadata

According to [AD- 2], Wrapped Metadata are grouped in Primary Metadata, common to all Sentinel 3 products and Secondary Metadata, specific for instrument and processing level.

Primary Metadata are described in [AD- 2].

Secondary Metadata for the SRAL instrument are reported in Table 5-2. Last columns of the table indicate the applicability of Metadata fields to the processing Level.

< Complete secondary metadata is described in details in [AD- 4].

³ Number of Package components includes the manifest and the OLQC Report.

The content of this table will be embedded in the document when it will be finalized>

Table 5-15: Secondary Metadata for SR_1_SRA_BS products

5.1.3.4 L1B-S Measurement Data Files

The content of the Level 1B-S SRAL product is described below:

Element name	Description	Range or value	T	D
time_l1bs_echo_sar_ku	Number of L1Bs ECHO_SAR_Ku measurements			
time_l1bs_echo_plrm	Number of L1Bs ECHO_PLRM measurements			
echo_sample_ind	Number of samples in a waveform	128		
max_multi_stack_ind	Maximum number of multilook beams per stack	256		
<Specific global attributes>	:Conventions = netCDF convention :mission_name = Name of the mission :altimeter_sensor_name = Name of the altimeter sensor :gnss_sensor_name = Name of the GNSS sensor :doris_sensor_name = Name of the DORIS sensor :acq_station_name = Identification of the acquisition station :first_meas_time = UTC Date of the first measurement of the data set (YYYY-MM-DD HH:MM:SS.mmmmmm) :last_meas_time = UTC Date of the last measurement of the data set (YYYY-MM-DD HH:MM:SS.mmmmmm) :xref_altimeter_level0 = Name of the altimeter level 0 data file :xref_time_correlation = Name of the file containing the time correlation :xref_altimeter_orbit = Name of the file containing the Orbit Data :xref_doris_uso = Name of the file containing the DORIS-derived USO frequency :xref_altimeter_ltm_lrm_cal1 = Name of the LTM file containing the LRM mode CAL1 parameters :xref_altimeter_ltm_sar_cal1 = Name of the LTM file containing the SAR mode CAL1 parameters :xref_altimeter_ltm_ku_cal2 = Name of the LTM file containing the Ku-band CAL2 parameters :xref_altimeter_ltm_c_cal2 = Name of the LTM file containing the C-band CAL2 parameters :xref_altimeter_characterisation = Name of the altimeter characterisation data file :semi_major_ellipsoid_axis = Semi-major axis of the reference ellipsoid (meters) :ellipsoid_flattening = Flattening coefficient of the reference ellipsoid			
echo_sample_ind	number of samples in I2+Q2, I and Q echoes		sc	echo_sample_ind

units	Unit name	count		1
comment	Set to be compliant with the CF-1.6 convention			1
max_multi_stack_ind	maximum number of multilook beams per stack		ss	max_multi_stack_ind
units	Unit name	count		1
comment	Set to be compliant with the CF-1.6 convention			1

In addition to the 2 variables shown in the previous table, the Level 1B-S SRAL product contains the variables described in sections 5.1.3.4.1 and 5.1.3.4.2.

5.1.3.4.1 ECHO_SAR_Ku

The Echo Sar Ku content is reported in the table below:

time_l1bs_echo_sar_ku	UTC : l1bs_echo_sar_ku mode		D	time_l1bs_echo_sar_ku
standard_name	Name of the physical quantity following the NetCDF Climate and Forecast (CF) Metadata Conventions	time		1
calendar		gregorian		1
units	Unit name	seconds since 2000-01-01 00:00:00.0		1
UTC_day_l1bs_echo_sar_ku	day UTC : l1bs_echo_sar_ku mode		ss	time_l1bs_echo_sar_ku
units	Unit name	days since 2000-01-01 00:00:00.0		1
_FillValue	Default value for unused or not computed elements	32767s		1
UTC_sec_l1bs_echo_sar_ku	seconds in the day UTC : l1bs_echo_sar_ku mode		D	time_l1bs_echo_sar_ku
units	Unit name	s		1
_FillValue	Default value for unused or not computed elements	1.84467440737096e+19		1
lat_l1bs_echo_sar_ku	latitude : l1bs_echo_sar_ku mode		sl	time_l1bs_echo_sar_ku
standard_name	Name of the physical quantity following the NetCDF Climate and Forecast (CF) Metadata Conventions	latitude		1
scale_factor	The data must be multiplied by this factor after reading	1.e-06		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.		1
units	Unit name	degrees_north		1
_FillValue	Default value for unused or not computed elements	2147483647		1
lon_l1bs_echo_sar_ku	longitude : l1bs_echo_sar_ku mode		sl	time_l1bs_echo_sar_ku
standard_name	Name of the physical quantity following the NetCDF Climate and Forecast (CF) Metadata Conventions	longitude		1
scale_factor	The data must be multiplied by this factor after reading	1.e-06		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.		1
units	Unit name	degrees_east		1
_FillValue	Default value for unused or not computed elements	2147483647		1
surf_type_l1bs_echo_sar_ku	altimeter surface type : l1bs_echo_sar_ku mode		sc	time_l1bs_echo_sar_ku
flag_values	Flag values	0b, 1b, 2b, 3b		1
comment	value the closest in time to the reference measurement			1

flag_meanings	Flag meanings	open_ocean_or_semi- enclosed_seas enclosed_seas_or_lakes continental_ice land		1
_FillValue	Default value for unused or not computed elements	127b		1
coordinates	lon_l1bs_echo_sar_ku lat_l1bs_echo_sar_ku			1
records_count_l1bs_echo_sar_ku	L1b record counters within the product : l1bs_echo_sar_ku mode		sl	time_l1bs_echo_sar_ku
units	Unit name	count		1
comment	range 1 to number of L1b records			1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1bs_echo_sar_ku lat_l1bs_echo_sar_ku			1
alt_l1bs_echo_sar_ku	altitude of satellite : l1bs_echo_sar_ku mode		sl	time_l1bs_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	700000.		1
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1bs_echo_sar_ku lat_l1bs_echo_sar_ku			1
orb_alt_rate_l1bs_echo_sar_ku	orbital altitude rate : l1bs_echo_sar_ku mode		ss	time_l1bs_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	m/s		1
_FillValue	Default value for unused or not computed elements	32767		1
coordinates	lon_l1bs_echo_sar_ku lat_l1bs_echo_sar_ku			1
x_pos_l1bs_echo_sar_ku	satellite altitude - x component : l1bs_echo_sar_ku mode		D	time_l1bs_echo_sar_ku
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	18446744073709551616		1
y_pos_l1bs_echo_sar_ku	satellite altitude - y component : l1bs_echo_sar_ku mode		D	time_l1bs_echo_sar_ku
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	18446744073709551616		1
z_pos_l1bs_echo_sar_ku	satellite altitude - z component : l1bs_echo_sar_ku mode		D	time_l1bs_echo_sar_ku
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	18446744073709551616		1
x_vel_l1bs_echo_sar_ku	satellite velocity - x component : l1bs_echo_sar_ku mode		D	time_l1bs_echo_sar_ku

units	Unit name	m/s		1
_FillValue	Default value for unused or not computed elements	18446744073709551616		1
y_vel_l1bs_echo_sar_ku	satellite velocity - y component : l1bs_echo_sar_ku mode		D	time_l1bs_echo_sar_ku
units	Unit name	m/s		1
_FillValue	Default value for unused or not computed elements	18446744073709551616		1
z_vel_l1bs_echo_sar_ku	satellite velocity - z component : l1bs_echo_sar_ku mode		D	time_l1bs_echo_sar_ku
units	Unit name	m/s		1
_FillValue	Default value for unused or not computed elements	18446744073709551616		1
meas_x_pos_l1bs_echo_sar_ku	measurement location - x component : l1bs_echo_sar_ku mode		D	time_l1bs_echo_sar_ku
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	18446744073709551616		1
meas_y_pos_l1bs_echo_sar_ku	measurement location - y component : l1bs_echo_sar_ku mode		D	time_l1bs_echo_sar_ku
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	18446744073709551616		1
meas_z_pos_l1bs_echo_sar_ku	measurement location - z component : l1bs_echo_sar_ku mode		D	time_l1bs_echo_sar_ku
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	18446744073709551616		1
roll_sat_pointing_l1bs_echo_sar_ku	satellite pointing angle - roll : l1bs_echo_sar_ku mode		sl	time_l1bs_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	degrees		1
_FillValue	Default value for unused or not computed elements	2147483647		1
comment	value for the closest in time from the burst time tag, given in the nadir pointing reference frame			1
coordinates	lon_l1bs_echo_sar_ku lat_l1bs_echo_sar_ku			1
pitch_sat_pointing_l1bs_echo_sar_ku	satellite pointing angle - pitch : l1bs_echo_sar_ku mode		sl	time_l1bs_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	degrees		1
_FillValue	Default value for unused or not computed elements	2147483647		1
comment	value for the closest in time from the burst time tag, given in the nadir pointing reference frame			1
coordinates	lon_l1bs_echo_sar_ku lat_l1bs_echo_sar_ku			1

yaw_sat_pointing_l1bs_echo_sar_ku	satellite pointing angle - yaw : l1bs_echo_sar_ku mode		sl	time_l1bs_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	degrees		1
_FillValue	Default value for unused or not computed elements	2147483647		1
comment	value for the closest in time from the burst time tag, given in the nadir pointing reference frame			1
coordinates	lon_l1bs_echo_sar_ku lat_l1bs_echo_sar_ku			1
roll_sral_mispointing_l1bs_echo_sar_ku	SRAL mispointing angle - roll : l1bs_echo_sar_ku mode		sl	time_l1bs_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	degrees		1
_FillValue	Default value for unused or not computed elements	2147483647		1
comment	value for the closest in time from the burst time tag, given in the nadir pointing reference frame			1
coordinates	lon_l1bs_echo_sar_ku lat_l1bs_echo_sar_ku			1
pitch_sral_mispointing_l1bs_echo_sar_ku	SRAL mispointing angle - pitch : l1bs_echo_sar_ku mode		sl	time_l1bs_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	degrees		1
_FillValue	Default value for unused or not computed elements	2147483647		1
comment	value for the closest in time from the burst time tag, given in the nadir pointing reference frame			1
coordinates	lon_l1bs_echo_sar_ku lat_l1bs_echo_sar_ku			1
yaw_sral_mispointing_l1bs_echo_sar_ku	SRAL mispointing angle - yaw : l1bs_echo_sar_ku mode		sl	time_l1bs_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	degrees		1
_FillValue	Default value for unused or not computed elements	2147483647		1
comment	value for the closest in time from the burst time tag, given in the nadir pointing reference frame			1
coordinates	lon_l1bs_echo_sar_ku lat_l1bs_echo_sar_ku			1
range_ku_l1bs_echo_sar_ku	corrected range for ku band : l1bs_echo_sar_ku mode		sl	time_l1bs_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1

add_offset	This offset must be added to the data after reading (and after scaling if needed)	700000.		1
units	Unit name	m		1
comment	Distance between the altimeter reference point and the surface height associated to a range gate used as reference inside the tracking window (reference tracking point), corrected for USO frequency drift and internal path correction			1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1bs_echo_sar_ku lat_l1bs_echo_sar_ku			1
int_path_cor_ku_l1bs_echo_sar_ku	internal path correction for ku band : l1bs_echo_sar_ku mode		sl	time_l1bs_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	m		1
comment	Value the closest in time from the burst time tag			1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1bs_echo_sar_ku lat_l1bs_echo_sar_ku			1
uso_cor_l1bs_echo_sar_ku	USO frequency drift correction : l1bs_echo_sar_ku mode		sl	time_l1bs_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	2147483647		1
comment	Value the closest in time from the burst time tag			1
coordinates	lon_l1bs_echo_sar_ku lat_l1bs_echo_sar_ku			1
cog_cor_l1bs_echo_sar_ku	Distance antenna-CoG correction : l1bs_echo_sar_ku mode		ss	time_l1bs_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	m		1
comment	Distance in the z-component between the centre of mass of the satellite and the altimeter antenna reference point			1
_FillValue	Default value for unused or not computed elements	32767		1
coordinates	lon_l1bs_echo_sar_ku lat_l1bs_echo_sar_ku			1
agccode_ku_l1bs_echo_sar_ku	AGCCODE for ku band : l1bs_echo_sar_ku mode		sc	time_l1bs_echo_sar_ku
units	Unit name	dB		1
_FillValue	Default value for unused or not computed elements	127b		1
coordinates	lon_l1bs_echo_sar_ku lat_l1bs_echo_sar_ku			1
agc_ku_l1bs_echo_sar_ku	corrected AGC for ku band : l1bs_echo_sar_ku mode		sl	time_l1bs_echo_sar_ku

scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
comment	AGC corrected for instrumental errors - value the closest in time to the reference measurement			1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1bs_echo_sar_ku lat_l1bs_echo_sar_ku			1
scale_factor_ku_l1bs_echo_sar_ku	scaling factor for sigma0 evaluation for ku band: l1bs_echo_sar_ku mode		sl	time_l1bs_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
comment	scaling factor corrected for AGC instrumental errors and internal calibration			1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1bs_echo_sar_ku lat_l1bs_echo_sar_ku			1
sig0_cal_ku_l1bs_echo_sar_ku	internal calibration correction on Sigma0 for ku band: l1bs_echo_sar_ku mode		sl	time_l1bs_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1bs_echo_sar_ku lat_l1bs_echo_sar_ku			1
snr_ku_l1bs_echo_sar_ku	snr estimation for ku band: l1bs_echo_sar_ku mode		sl	time_l1bs_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
comment	Snr computed on the closest PLRM waveform			1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1bs_echo_sar_ku lat_l1bs_echo_sar_ku			1
i2q2_meas_ku_l1bs_echo_sar_ku	multilooked I2+Q2 measurement for ku band : l1bs_echo_sar_ku mode		ul	time_l1bs_echo_sar_ku echo_sample_ind
comment	the echo is corrected for Doppler range effect, phase/power burst calibration and GPRW effect . the echo is scaled using the corrected AGC (agc_ku_l1b_echo_sar_ku)			1
scale_factor	The data must be multiplied by this factor after reading	1.00e-03		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1

units	Unit name	count		1
_FillValue	Default value for unused or not computed elements	4294967295		1
coordinates	lon_l1bs_echo_sar_ku lat_l1bs_echo_sar_ku			1
nb_stack_l1bs_echo_sar_ku	number of waveforms summed in stack : l1bs_echo_sar_ku mode		us	time_l1bs_echo_sar_ku
units	Unit name	count		1
_FillValue	Default value for unused or not computed elements	65535		1
coordinates	lon_l1bs_echo_sar_ku lat_l1bs_echo_sar_ku			1
max_stack_l1bs_echo_sar_ku	maximum power of stack : l1bs_echo_sar_ku mode		ul	time_l1bs_echo_sar_ku
units	Unit name	FFT power unit		1
_FillValue	Default value for unused or not computed elements	4294967295		1
coordinates	lon_l1bs_echo_sar_ku lat_l1bs_echo_sar_ku			1
max_loc_stack_l1bs_echo_sar_ku	Location of the maximum power of stack : l1bs_echo_sar_ku mode		ss	time_l1bs_echo_sar_ku
comment	Doppler beam angle corresponding to the maximum power in the stack			
scale_factor	The data must be multiplied by this factor after reading	1.00e-06		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	1.570000e+00		1
units	Unit name	rad		1
_FillValue	Default value for unused or not computed elements	32767		1
coordinates	lon_l1bs_echo_sar_ku lat_l1bs_echo_sar_ku			1
stdev_stack_l1bs_echo_sar_ku	standard deviation of stack : l1bs_echo_sar_ku mode		ul	time_l1bs_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-06		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	rad		1
_FillValue	Default value for unused or not computed elements	4294967295		1
coordinates	lon_l1bs_echo_sar_ku lat_l1bs_echo_sar_ku			1
skew_stack_l1bs_echo_sar_ku	skewness of stack : l1bs_echo_sar_ku mode		sl	time_l1bs_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-06		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	count		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1bs_echo_sar_ku lat_l1bs_echo_sar_ku			1
kurt_stack_l1bs_echo_sar_ku	kurtosis of stack : l1bs_echo_sar_ku mode		sl	time_l1bs_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-06		1

add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	count		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1bs_echo_sar_ku lat_l1bs_echo_sar_ku			1
beam_ang_stack_l1bs_echo_sar_ku	look angles in stack: l1bs_echo_sar_ku mode		ss	time_l1bs_echo_sar_ku max_multi_stack_ind
comment	Look angles in stack: l1bs_echo_sar_ku mode. These are looking angles and not beam angles. The useful values of the table are the first nb_stack_l1bs_echo_sar_ku values			1
scale_factor	The data must be multiplied by this factor after reading	1.00e-06		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	rad		1
_FillValue	Default value for unused or not computed elements	32767		1
coordinates	lon_l1bs_echo_sar_ku lat_l1bs_echo_sar_ku			1
beam_form_l1bs_echo_sar_ku	flag on beam formation quality in stack : l1bs_echo_sar_ku mode		us	time_l1bs_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	percent		1
_FillValue	Default value for unused or not computed elements	65535		1
coordinates	lon_l1bs_echo_sar_ku lat_l1bs_echo_sar_ku			1
burst_start_ind_l1bs_echo_sar_ku	Burst start index for stack building : l1bs_echo_sar_ku mode		sl	time_l1bs_echo_sar_ku
units	Unit name	count		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1bs_echo_sar_ku lat_l1bs_echo_sar_ku			1
burst_stop_ind_l1bs_echo_sar_ku	Burst stop index for stack building: l1bs_echo_sar_ku mode		sl	time_l1bs_echo_sar_ku
units	Unit name	count		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1bs_echo_sar_ku lat_l1bs_echo_sar_ku			1
iq_scale_factor_l1bs_echo_sar_ku	dynamic scale factor for I/Q waveforms i_echoes_ku_l1bs_echo_sar_ku and q_echoes_ku_l1bs_echo_sar_ku		F	time_l1bs_echo_sar_ku
_FillValue	Default value for unused or not computed elements	18446744073709551616		1
comment	Dynamic scale factor for I/Q waveforms i_echoes_ku_l1bs_echo_sar_ku and q_echoes_ku_l1bs_echo_sar_ku			1
i_echoes_ku_l1bs_echo_sar_ku	fully calibrated ku band echoes, i measurements aligned within the stack : l1bs_echo_sar_ku mode		sc	time_l1bs_echo_sar_ku max_multi_stack_ind

				echo_sample_ind
units	Unit name	count		1
_FillValue	Default value for unused or not computed elements	-128		1
comment	Fully calibrated ku band echoes, I values (256*128 samples) in the frequency domain, and aligned within the stack. the useful echoes of the table are the first nb_stack_l1bs_echo_sar_ku echoes. The echoes must be scaled with iq_scale_factor_l1bs_echo_sar_ku. The echoes are not scaled using the corrected AGC.			1
coordinates	lon_l1bs_echo_sar_ku lat_l1bs_echo_sar_ku			1
q_echoes_ku_l1bs_echo_sar_ku	fully calibrated ku band echoes, q measurements aligned within the stack: l1bs_echo_sar_ku mode		sc	time_l1bs_echo_sar_ku max_multi_stack_ind echo_sample_ind
units	Unit name	count		1
_FillValue	Default value for unused or not computed elements	-128		1
comment	Fully calibrated ku band echoes, Q values (256*128 samples) in the frequency domain, and aligned within the stack. the useful echoes of the table are the first nb_stack_l1bs_echo_sar_ku echoes. The echoes must be scaled with iq_scale_factor_l1bs_echo_sar_ku. The echoes are not scaled using the corrected AGC.			1
coordinates	lon_l1bs_echo_sar_ku lat_l1bs_echo_sar_ku			1
start_look_angle_stack_l1bs_echo_sar_ku	start look angle in stack : l1bs_echo_sar_ku mode		ss	time_l1bs_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-06		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	rad		1
_FillValue	Default value for unused or not computed elements	32767		1
coordinates	lon_l1bs_echo_sar_ku lat_l1bs_echo_sar_ku			1
stop_look_angle_stack_l1bs_echo_sar_ku	stop look angle in stack : l1bs_echo_sar_ku mode		ss	time_l1bs_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-06		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	rad		1
_FillValue	Default value for unused or not computed elements	32767		1
coordinates	lon_l1bs_echo_sar_ku lat_l1bs_echo_sar_ku			1
start_beam_ang_stack_l1bs_echo_sar_ku	start doppler beam angle in stack: l1bs_echo_sar_ku mode		ss	time_l1bs_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-06		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	rad		1

_FillValue	Default value for unused or not computed elements	32767		1
coordinates	lon_l1bs_echo_sar_ku lat_l1bs_echo_sar_ku			1
stop_beam_ang_stack_l1bs_echo_sar_ku	stop doppler beam angle in stack: l1bs_echo_sar_ku mode		ss	time_l1bs_echo_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-06		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	rad		1
_FillValue	Default value for unused or not computed elements	32767		1
coordinates	lon_l1bs_echo_sar_ku lat_l1bs_echo_sar_ku			1
power_var_stack_l1bs_echo_sar_ku	power variations within the stack: l1bs_echo_sar_ku mode		ul	time_l1bs_echo_sar_ku max_multi_stack_ind
comment	the useful values of the table are the first nb_stack_l1bs_echo_sar_ku values, one value of power for each individual echoe			1
units	Unit name	FFT power unit		1
_FillValue	Default value for unused or not computed elements	4294967295		1
coordinates	lon_l1bs_echo_sar_ku lat_l1bs_echo_sar_ku			1

Table 5-16: Content of the Level 1B-S measurement data file (SR_1_SRA_BS product) : ECHO_SAR_Ku parameter

5.1.3.4.2 ECHO_PLRM

The Echo PLRM content is reported in the table below:

time_l1bs_echo_plrm	UTC : l1bs_echo_plrm mode		D	time_l1bs_echo_plrm
standard_name	Name of the physical quantity following the NetCDF Climate and Forecast (CF) Metadata Conventions	time		1
calendar		gregorian		1
units	Unit name	seconds since 2000-01-01 00:00:00.0		1
UTC_day_l1bs_echo_plrm	day UTC : l1bs_echo_plrm mode		ss	time_l1bs_echo_plrm
units	Unit name	days since 2000-01-01 00:00:00.0		1
_FillValue	Default value for unused or not computed elements	32767s		1
UTC_sec_l1bs_echo_plrm	seconds in the day UTC : l1bs_echo_plrm mode		D	time_l1bs_echo_plrm
units	Unit name	s		1
_FillValue	Default value for unused or not computed elements	1.84467440737096e+19		1
lat_l1bs_echo_plrm	latitude : l1bs_echo_plrm mode		sl	time_l1bs_echo_plrm
standard_name	Name of the physical quantity following the NetCDF Climate and Forecast (CF) Metadata Conventions	latitude		1
scale_factor	The data must be multiplied by this factor after reading	1.e-06		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.		1
units	Unit name	degrees_north		1
_FillValue	Default value for unused or not computed elements	2147483647		1
lon_l1bs_echo_plrm	longitude : l1bs_echo_plrm mode		sl	time_l1bs_echo_plrm
standard_name	Name of the physical quantity following the NetCDF Climate and Forecast (CF) Metadata Conventions	longitude		1
scale_factor	The data must be multiplied by this factor after reading	1.e-06		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.		1
units	Unit name	degrees_east		1
_FillValue	Default value for unused or not computed elements	2147483647		1
surf_type_l1bs_echo_plrm	altimeter surface type : l1bs_echo_plrm mode		sc	time_l1bs_echo_plrm
flag_values	Flag values	0b, 1b, 2b, 3b		1
comment	value the closest in time to the reference measurement			1

flag_meanings	Flag meanings	open_ocean_or_semi- enclosed_seas enclosed_seas_or_lakes continental_ice land		1
_FillValue	Default value for unused or not computed elements	127b		1
coordinates	lon_l1bs_echo_plrm lat_l1bs_echo_plrm			1
records_count_l1bs_echo_plrm	L1b record counters within the product : l1bs_echo_plrm mode		sl	time_l1bs_echo_plrm
units	Unit name	count		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1bs_echo_plrm lat_l1bs_echo_plrm			1
alt_l1bs_echo_plrm	altitude of satellite : l1bs_echo_plrm mode		sl	time_l1bs_echo_plrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	700000.		1
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1bs_echo_plrm lat_l1bs_echo_plrm			1
orb_alt_rate_l1bs_echo_plrm	orbital altitude rate : l1bs_echo_plrm mode		ss	time_l1bs_echo_plrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	m/s		1
_FillValue	Default value for unused or not computed elements	32767		1
coordinates	lon_l1bs_echo_plrm lat_l1bs_echo_plrm			1
roll_sat_pointing_l1bs_echo_plrm	satellite pointing angle - roll : l1bs_echo_plrm mode		sl	time_l1bs_echo_plrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	degrees		1
_FillValue	Default value for unused or not computed elements	2147483647		1
comment	value for the closest in time from the burst time tag, given in the nadir pointing reference frame			1
coordinates	lon_l1bs_echo_plrm lat_l1bs_echo_plrm			1
pitch_sat_pointing_l1bs_echo_plrm	satellite pointing angle - pitch : l1bs_echo_plrm mode		sl	time_l1bs_echo_plrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1

units	Unit name	degrees		1
_FillValue	Default value for unused or not computed elements	2147483647		1
comment	value for the closest in time from the burst time tag, given in the nadir pointing reference frame			1
coordinates	lon_l1bs_echo_plrm lat_l1bs_echo_plrm			1
yaw_sat_pointing_l1bs_echo_plrm	satellite pointing angle - yaw : l1bs_echo_plrm mode		sl	time_l1bs_echo_plrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	degrees		1
_FillValue	Default value for unused or not computed elements	2147483647		1
comment	value for the closest in time from the burst time tag, given in the nadir pointing reference frame			1
coordinates	lon_l1bs_echo_plrm lat_l1bs_echo_plrm			1
roll_sral_mispointing_l1bs_echo_plrm	SRAL mispointing angle - roll : l1bs_echo_plrm mode		sl	time_l1bs_echo_plrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	degrees		1
_FillValue	Default value for unused or not computed elements	2147483647		1
comment	value for the closest in time from the burst time tag, given in the nadir pointing reference frame			1
coordinates	lon_l1bs_echo_plrm lat_l1bs_echo_plrm			1
pitch_sral_mispointing_l1bs_echo_plrm	SRAL mispointing angle - pitch : l1bs_echo_plrm mode		sl	time_l1bs_echo_plrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	degrees		1
_FillValue	Default value for unused or not computed elements	2147483647		1
comment	value for the closest in time from the burst time tag, given in the nadir pointing reference frame			1
coordinates	lon_l1bs_echo_plrm lat_l1bs_echo_plrm			1
yaw_sral_mispointing_l1bs_echo_plrm	SRAL mispointing angle - yaw : l1bs_echo_plrm mode		sl	time_l1bs_echo_plrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	degrees		1
_FillValue	Default value for unused or not computed elements	2147483647		1

comment	value for the closest in time from the burst time tag, given in the nadir pointing reference frame			1
coordinates	lon_l1bs_echo_plrm lat_l1bs_echo_plrm			1
range_ku_l1bs_echo_plrm	corrected range for ku band : l1bs_echo_plrm mode		sl	time_l1bs_echo_plrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	700000.		1
units	Unit name	m		1
comment	Distance between the altimeter reference point and the surface height associated to a range gate used as reference inside the tracking window (reference tracking point), corrected for USO frequency drift and internal path correction			1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1bs_echo_plrm lat_l1bs_echo_plrm			1
int_path_cor_ku_l1bs_echo_plrm	internal path correction for ku band : l1bs_echo_plrm mode		sl	time_l1bs_echo_plrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	m		1
comment	Value the closest in time from the burst time tag			1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1bs_echo_plrm lat_l1bs_echo_plrm			1
uso_cor_l1bs_echo_plrm	USO frequency drift correction : l1bs_echo_plrm mode		sl	time_l1bs_echo_plrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	2147483647		1
comment	Value the closest in time from the burst time tag			1
coordinates	lon_l1bs_echo_plrm lat_l1bs_echo_plrm			1
cog_cor_l1bs_echo_plrm	Distance antenna-CoG correction : l1bs_echo_plrm mode		ss	time_l1bs_echo_plrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	m		1
comment	Distance in the z-component between the centre of mass of the satellite and the altimeter antenna reference point			1
_FillValue	Default value for unused or not computed elements	32767s		1
coordinates	lon_l1bs_echo_plrm lat_l1bs_echo_plrm			1

agc_ku_l1bs_echo_plrm	corrected AGC for ku band: l1bs_echo_plrm mode		sl	time_l1bs_echo_plrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
comment	AGC corrected for instrumental errors			1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1bs_echo_plrm lat_l1bs_echo_plrm			1
scale_factor_ku_l1bs_echo_plrm	scaling factor for sigma0 evaluation for ku band: l1bs_echo_plrm mode		sl	time_l1bs_echo_plrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
comment	scaling factor corrected for AGC instrumental errors and internal calibration			1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1bs_echo_plrm lat_l1bs_echo_plrm			1
sig0_cal_ku_l1bs_echo_plrm	internal calibration correction on Sigma0 for ku band: l1bs_echo_plrm mode		sl	time_l1bs_echo_plrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1bs_echo_plrm lat_l1bs_echo_plrm			1
snr_ku_l1bs_echo_plrm	snr estimation for ku band: l1bs_echo_plrm mode		sl	time_l1bs_echo_plrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1bs_echo_plrm lat_l1bs_echo_plrm			1
agc_c_l1bs_echo_plrm	corrected AGC for c band: l1bs_echo_plrm mode		sl	time_l1bs_echo_plrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
comment	AGC corrected for instrumental errors			1
_FillValue	Default value for unused or not computed elements	2147483647		1

coordinates	lon_l1bs_echo_plrm lat_l1bs_echo_plrm			1
scale_factor_c_l1bs_echo_plrm	scaling factor for sigma0 evaluation for c band: l1bs_echo_plrm mode		sl	time_l1bs_echo_plrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
comment	scaling factor corrected for AGC instrumental errors and internal calibration			1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1bs_echo_plrm lat_l1bs_echo_plrm			1
sig0_cal_c_l1bs_echo_plrm	internal calibration correction on Sigma0 for ku band: l1bs_echo_plrm mode		sl	time_l1bs_echo_plrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1bs_echo_plrm lat_l1bs_echo_plrm			1
snr_c_l1bs_echo_plrm	snr estimation for c band: l1bs_echo_plrm mode		sl	time_l1bs_echo_plrm
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1bs_echo_plrm lat_l1bs_echo_plrm			1
i2q2_meas_ku_l1bs_echo_plrm	I2+Q2 measurement for ku band : l1bs_echo_plrm mode		ul	time_l1bs_echo_plrm echo_sample_ind
comment	the echo is the so-called ku-band averaged echo, corrected for the GPRW effect			1
scale_factor	The data must be multiplied by this factor after reading	1.00e-03		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	count		1
_FillValue	Default value for unused or not computed elements	4294967295		1
coordinates	lon_l1bs_echo_plrm lat_l1bs_echo_plrm			1
i2q2_meas_c_l1bs_echo_plrm	I2+Q2 measurement for c band : l1bs_echo_plrm mode		ul	time_l1bs_echo_plrm echo_sample_ind
comment	the echo is the so-called c-band averaged echo, corrected for the GPRW effect			1
scale_factor	The data must be multiplied by this factor after reading	1.00e-03		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1

units	Unit name	count		1
_FillValue	Default value for unused or not computed elements	4294967295		1
coordinates	lon_l1bs_echo_plrm lat_l1bs_echo_plrm			1

Table 5-17: Content of the Level 1B-S measurement data file (SR_1_SRA_BS product) : ECHO_PLRM parameter

5.1.4 SRAL “SR_1_CAL_”

A Level 1 Calibration SRAL product contains one "calibration data file" containing the L1b calibration parameters for the calibration nominal scenario:

- CAL1_LRM_IQ: L1b PTR calibration measurements in LRM mode for I,Q configuration
- CAL1_SAR_Norm: L1b PTR calibration measurements in SAR mode
- CAL1_SAR_Auto: L1b PTR calibration measurements in SAR mode / AGC calibration
- CAL2_SAR_Ku: L1b GPRW calibration measurements - Ku band (SAR mode)
- CAL2_SAR_C: L1b GPRW calibration measurements - C band (SAR mode)

5.1.4.1 Product Summary

Product Package Type SR_1_CAL_		Description L1b calibration parameters for LRM and SAR mode			
Product Level	Diss. Timeliness	Product Category	Application Domain		Spatial Resolution
1	(NRT)	Not Available to the user			
Product Dissemination Unit N/A		Number of Package Components	Number of Measurement Data Files	Number of Annotation Data Files	Number of Representation Information Files
		3 ⁴	1	0	0
Product Package Structure					
Manifest file (see section 5.1.4.2 for more details)					
File name			Composition		
xfdumanifest.xml					
Measurement Data files (see section 5.1.4.3 for more details)					N.O
File name			Composition		
calibration.nc			calibration data file containing the L1b calibration parameters: CAL1_LRM_IQ, CAL1_SAR_Norm, CAL1_SAR_Auto, CAL2_SAR_Ku, CAL2_SAR_C		
Annotation Data files					N.O
File name			Composition		
none					
Representation Information Files					N.O
File name			Composition		
none					

Table 5-18: SRAL Calibration Level 1 product physical composition

5.1.4.2 Manifest File

The structure of the Manifest element is described in [AD- 2].

⁴ Number of Package components includes the manifest and the OLQC Report.

5.1.4.3 Product Metadata

According to [AD- 2], Wrapped Metadata are grouped in Primary Metadata, common to all Sentinel 3 products and Secondary Metadata, specific for instrument and processing level.

Primary Metadata are described in [AD- 2].

Secondary Metadata for the SRAL instrument are reported in Table 5-2.

5.1.4.4 L1 Calibration Data Files

The content of the Level 1 Calibration SRAL product is described in the table below:

Element name	Description	Range or value	T	D
time_l1b_cal1_lrm_iq	Number of L1B CAL1_LRM_IQ measurements			
time_l1b_cal1_sar_norm	Number of L1B CAL1_SAR_Norm measurements			
time_l1b_cal1_sar_auto	Number of L1B CAL1_SAR_Auto measurements			
time_l1b_cal2_sar_ku	Number of L1B CAL2_SAR_Ku measurements			
time_l1b_cal2_sar_c	Number of L1B CAL2_SAR_C measurements			
ptr_sec_lobe_ind	Maximum number of secondary lobes of the PTR	60		
sar_ku_pulse_burst_ind	Number of Ku-band pulses per burst in SAR mode	64		
echo_sample_ind	Number of samples in a waveform	128		
agc_ind	Number of on-board AGC possible values	63		
<Specific global attributes>	:Conventions = netCDF convention :mission_name = Name of the mission :altimeter_sensor_name = Name of the altimeter sensor :gnss_sensor_name = Name of the GNSS sensor :doris_sensor_name = Name of the DORIS sensor :acq_station_name = Identification of the acquisition station :first_meas_time = UTC Date of the first measurement of the data set (YYYY-MM-DD HH:MM:SS.mmmmmm) :last_meas_time = UTC Date of the last measurement of the data set (YYYY-MM-DD HH:MM:SS.mmmmmm) :xref_altimeter_level0 = Name of the altimeter level 0 data file:xref_altimeter_orbit = Name of the file containing the Orbit Data :xref_altimeter_ltm_lrm_cal1 = Name of the LTM file containing the LRM mode CAL1 parameters :xref_altimeter_ltm_sar_cal1 = Name of the LTM file containing the SAR mode CAL1 parameters :xref_altimeter_ltm_ku_cal2 = Name of the LTM file containing the Ku-band CAL2 parameters :xref_altimeter_ltm_c_cal2 = Name of the LTM file containing the C-band CAL2 parameters		S	

	:xref_altimeter_characterisation = Name of the altimeter characterisation data file :semi_major_ellipsoid_axis = Semi-major axis of the reference ellipsoid (meters) :ellipsoid_flattening = Flattening coefficient of the reference ellipsoid		ul D	
ptr_sec_lobe_ind	maximum number of secondary lobes of the PTR		sc	ptr_sec_lobe_ind
units	Unit name	count		1
comment	Set to be compliant with the CF-1.6 convention			1
sar_ku_pulse_burst_ind	number of Ku-band pulses per burst in SAR mode		sc	sar_ku_pulse_burst_ind
units	Unit name	count		1
comment	Set to be compliant with the CF-1.6 convention			1
echo_sample_ind	number of samples in I2+Q2, I and Q echoes		sc	echo_sample_ind
units	Unit name	count		1
comment	Set to be compliant with the CF-1.6 convention			1
agc_ind	number of on-board AGC possible values		sc	agc_ind
units	Unit name	count		1
comment	Set to be compliant with the CF-1.6 convention			1

Table 5-19: Content of the Level 1 measurement data file (SR_1_CAL product)

In addition to these 4 variables, the Level 1 Calibration SRAL product contains the variables described in sections 5.1.4.4.1, 5.1.4.4.2, 5.1.4.4.3, 5.1.4.4.4 and 5.1.4.4.5.

5.1.4.4.1 CAL1_LRM_IQ

The content of the CAL1_LRM_IQ is described in the table below:

Element name	Description	Range or value	T	D
time_l1b_cal1_lrm_iq	UTC : l1b_cal1_lrm_iq mode		D	time_l1b_cal1_lrm_iq
standard_name	Name of the physical quantity following the NetCDF Climate and Forecast (CF) Metadata Conventions	time		1
calendar		gregorian		1
units	Unit name	seconds since 2000-01-01 00:00:00.0		1
comment	value for the first calibration cycle			1
UTC_day_l1b_cal1_lrm_iq	day UTC : l1b_cal1_lrm_iq mode		ss	time_l1b_cal1_lrm_iq

units	Unit name	days since 2000-01-01 00:00:00.0		1
_FillValue	Default value for unused or not computed elements	32767		1
comment	value for the first calibration cycle			1
UTC_sec_l1b_cal1_lrm_iq	seconds in the day UTC : l1b_cal1_lrm_iq mode		D	time_l1b_cal1_lrm_iq
units	Unit name	s		1
_FillValue	Default value for unused or not computed elements	18446744073709551616		1
comment	value for the first calibration cycle			1
GPS_time_l1b_cal1_lrm_iq	GPS time : l1b_cal1_lrm_iq mode		D	time_l1b_cal1_lrm_iq
calendar		gregorian		1
units	Unit name	seconds since 1980-01-06 00:00:00.0		1
_FillValue	Default value for unused or not computed elements	18446744073709551616		1
comment	value for the first calibration cycle			1
isp_coarse_time_l1b_cal1_lrm_iq	ISP coarse time : l1b_cal1_lrm_iq mode		ul	time_l1b_cal1_lrm_iq
units	Unit name	second		1
_FillValue	Default value for unused or not computed elements	4294967295		1
comment	value for the first calibration cycle			1
isp_fine_time_l1b_cal1_lrm_iq	ISP fine time : l1b_cal1_lrm_iq mode		sl	time_l1b_cal1_lrm_iq
units	Unit name	2 ⁻²⁴ second		1
_FillValue	Default value for unused or not computed elements	2147483647		1
comment	value for the first calibration cycle			1
sral_fine_time_l1b_cal1_lrm_iq	ISP SRAL fine datation : l1b_cal1_lrm_iq mode		ul	time_l1b_cal1_lrm_iq
units	Unit name	137.5*10 ⁻⁹ second		1
_FillValue	Default value for unused or not computed elements	4294967295		1
comment	value for the first calibration cycle			1
lat_l1b_cal1_lrm_iq	latitude : l1b_cal1_lrm_iq mode		sl	time_l1b_cal1_lrm_iq
standard_name	Name of the physical quantity following the NetCDF Climate and Forecast (CF) Metadata Conventions	latitude		1
scale_factor	The data must be multiplied by this factor after reading	1.00e-06		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	degrees_north		1
_FillValue	Default value for unused or not computed elements	2147483647		1
comment	value for the first calibration cycle			1
lon_l1b_cal1_lrm_iq	longitude : l1b_cal1_lrm_iq mode		sl	time_l1b_cal1_lrm_iq

standard_name	Name of the physical quantity following the NetCDF Climate and Forecast (CF) Metadata Conventions	longitude		1
scale_factor	The data must be multiplied by this factor after reading	1.00e-06		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	degrees_east		1
_FillValue	Default value for unused or not computed elements	2147483647		1
comment	value for the first calibration cycle			1
alt_l1b_cal1_lrm_iq	altitude of satellite : l1b_cal1_lrm_iq mode		sl	time_l1b_cal1_lrm_iq
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	700000.		1
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_cal1_lrm_iq lat_l1b_cal1_lrm_iq			1
comment	value for the first calibration cycle			1
orb_alt_rate_l1b_cal1_lrm_iq	orbital altitude rate : l1b_cal1_lrm_iq mode		ss	time_l1b_cal1_lrm_iq
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	m/s		1
_FillValue	Default value for unused or not computed elements	32767		1
coordinates	lon_l1b_cal1_lrm_iq lat_l1b_cal1_lrm_iq			1
comment	value for the first calibration cycle			1
flag_time_status_l1b_cal1_lrm_iq	time status flag : l1b_cal1_lrm_iq mode		sc	time_l1b_cal1_lrm_iq
flag_values	Flag values	0b, 1b		1
comment	flag indicating if the time is synchronized or not with GPS time			1
flag_meanings	Flag meanings	synchronization no_synchronization		1
coordinates	lon_l1b_cal1_lrm_iq lat_l1b_cal1_lrm_iq			1
flag_time_corr_val_l1b_cal1_lrm_iq	time correlation validity flag : l1b_cal1_lrm_iq mode		sc	time_l1b_cal1_lrm_iq
flag_values	Flag values	0b, 1b, 2b		1
comment	flag indicating if the time correlation information is valid provided by OBSW, valid provided by Ground Segment or invalid			1
flag_meanings	Flag meanings	valid_obsw valid_ground_segment invalid		1
coordinates	lon_l1b_cal1_lrm_iq lat_l1b_cal1_lrm_iq			1

flag_man_pres_l1b_cal1_lrm_iq	manoeuvre presence flag: l1b_cal1_lrm_iq mode		sc	time_l1b_cal1_lrm_iq
flag_values	Flag values	0b, 1b		1
flag_meanings	Flag meanings	no_manoeuvre ongoing_manoeuvre		1
coordinates	lon_l1b_cal1_lrm_iq lat_l1b_cal1_lrm_iq			1
flag_man_thrust_l1b_cal1_lrm_iq	manoeuvre thrust flag: l1b_cal1_lrm_iq mode		sc	time_l1b_cal1_lrm_iq
flag_values	Flag values	0b, 1b		1
flag_meanings	Flag meanings	no_thrust ongoing_thrust		1
coordinates	lon_l1b_cal1_lrm_iq lat_l1b_cal1_lrm_iq			1
flag_man_plane_l1b_cal1_lrm_iq	manoeuvre plane flag: l1b_cal1_lrm_iq mode		sc	time_l1b_cal1_lrm_iq
flag_values	Flag values	0b, 1b		1
flag_meanings	Flag meanings	in_plane out_of_plane		1
coordinates	lon_l1b_cal1_lrm_iq lat_l1b_cal1_lrm_iq			1
flag_gnss_status_l1b_cal1_lrm_iq	validity flag for the navigation message from the gnss receiver: l1b_cal1_lrm_iq mode		sc	time_l1b_cal1_lrm_iq
flag_values	Flag values	0b, 1b		1
flag_meanings	Flag meanings	valid invalid_unavailable		1
coordinates	lon_l1b_cal1_lrm_iq lat_l1b_cal1_lrm_iq			1
comment	indicating if the navigation message from the GNSS receiver is valid or not valid/available			1
seq_count_l1b_cal1_lrm_iq	sequence count : l1b_cal1_lrm_iq mode		us	time_l1b_cal1_lrm_iq
_FillValue	Default value for unused or not computed elements	65535		1
coordinates	lon_l1b_cal1_lrm_iq lat_l1b_cal1_lrm_iq			1
comment	value for the first calibration cycle			1
isp_time_status_l1b_cal1_lrm_iq	ISP time status : l1b_cal1_lrm_iq mode		sc	time_l1b_cal1_lrm_iq
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	SRAL_OBT_extrapolated SRAL_OBT_updated_with_SMU_OBT		1
coordinates	lon_l1b_cal1_lrm_iq lat_l1b_cal1_lrm_iq			1
comment	value for the first calibration cycle			1
oper_instr_l1b_cal1_lrm_iq	operating instrument : l1b_cal1_lrm_iq mode		sc	time_l1b_cal1_lrm_iq
flag_values	Flag values	0b, 1b		1

_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	A B		1
coordinates	lon_l1b_cal1_lrm_iq lat_l1b_cal1_lrm_iq			1
comment	value for the first calibration cycle - Instrument A stands for SRAL Nominal and instrument B stands for SRAL Redundant			1
ptr_pow_ku_l1b_cal1_lrm_iq	total power of the PTR for ku band : l1b_cal1_lrm_iq mode		ul	time_l1b_cal1_lrm_iq
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	FFT power unit		1
_FillValue	Default value for unused or not computed elements	4294967295		1
coordinates	lon_l1b_cal1_lrm_iq lat_l1b_cal1_lrm_iq			1
ptr_pow_c_l1b_cal1_lrm_iq	total power of the PTR for c band : l1b_cal1_lrm_iq mode		ul	time_l1b_cal1_lrm_iq
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	FFT power unit		1
_FillValue	Default value for unused or not computed elements	4294967295		1
coordinates	lon_l1b_cal1_lrm_iq lat_l1b_cal1_lrm_iq			1
ptr_max_ku_l1b_cal1_lrm_iq	maximum value of the PTR for ku band : l1b_cal1_lrm_iq mode		ul	time_l1b_cal1_lrm_iq
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	FFT power unit		1
_FillValue	Default value for unused or not computed elements	4294967295		1
coordinates	lon_l1b_cal1_lrm_iq lat_l1b_cal1_lrm_iq			1
ptr_max_c_l1b_cal1_lrm_iq	maximum value of the PTR for c band : l1b_cal1_lrm_iq mode		ul	time_l1b_cal1_lrm_iq
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	FFT power unit		1
_FillValue	Default value for unused or not computed elements	4294967295		1
coordinates	lon_l1b_cal1_lrm_iq lat_l1b_cal1_lrm_iq			1
freq_ptr_max_ku_l1b_cal1_lrm_iq	frequency associated to the maximum of the PTR for ku band: l1b_cal1_lrm_iq mode		sl	time_l1b_cal1_lrm_iq
units	Unit name	Hz		1
_FillValue	Default value for unused or not computed elements	2147483647		1

coordinates	lon_l1b_cal1_lrm_iq lat_l1b_cal1_lrm_iq			1
freq_ptr_max_c_l1b_cal1_lrm_iq	frequency associated to the maximum of the PTR for c band: l1b_cal1_lrm_iq mode		sl	time_l1b_cal1_lrm_iq
units	Unit name	Hz		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_cal1_lrm_iq lat_l1b_cal1_lrm_iq			1
dist_ptr_max_ku_l1b_cal1_lrm_iq	distance associated with the maximum value of the PTR for ku band : l1b_cal1_lrm_iq mode		ul	time_l1b_cal1_lrm_iq
scale_factor	The data must be multiplied by this factor after reading	1.00e-06		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	4294967295		1
coordinates	lon_l1b_cal1_lrm_iq lat_l1b_cal1_lrm_iq			1
dist_ptr_max_c_l1b_cal1_lrm_iq	distance associated with the maximum value of the PTR for c band : l1b_cal1_lrm_iq mode		ul	time_l1b_cal1_lrm_iq
scale_factor	The data must be multiplied by this factor after reading	1.00e-06		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	4294967295		1
coordinates	lon_l1b_cal1_lrm_iq lat_l1b_cal1_lrm_iq			1
freq_ptr_median_ku_l1b_cal1_lrm_iq	frequency of the median point of the PTR for ku band:l1b_cal1_lrm_iq mode		sl	time_l1b_cal1_lrm_iq
units	Unit name	Hz		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_cal1_lrm_iq lat_l1b_cal1_lrm_iq			1
freq_ptr_median_c_l1b_cal1_lrm_iq	frequency of the median point of the PTR for c band:l1b_cal1_lrm_iq mode		sl	time_l1b_cal1_lrm_iq
units	Unit name	Hz		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_cal1_lrm_iq lat_l1b_cal1_lrm_iq			1
diff_tx_rx_ku_l1b_cal1_lrm_iq	difference of travel between the Tx and Rx lines for ku band:l1b_cal1_lrm_iq mode		ul	time_l1b_cal1_lrm_iq
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	4294967295		1

coordinates	lon_l1b_cal1_lrm_iq lat_l1b_cal1_lrm_iq			1
diff_tx_rx_c_l1b_cal1_lrm_iq	difference of travel between the Tx and Rx lines for c band:l1b_cal1_lrm_iq mode		ul	time_l1b_cal1_lrm_iq
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	4294967295		1
coordinates	lon_l1b_cal1_lrm_iq lat_l1b_cal1_lrm_iq			1
flag_ptr_pow_ku_l1b_cal1_lrm_iq	flag associated to the total power of the PTR for ku band : l1b_cal1_lrm_iq mode		sc	time_l1b_cal1_lrm_iq
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	valid invalid		1
coordinates	lon_l1b_cal1_lrm_iq lat_l1b_cal1_lrm_iq			1
flag_ptr_pow_c_l1b_cal1_lrm_iq	flag associated to the total power of the PTR for c band : l1b_cal1_lrm_iq mode		sc	time_l1b_cal1_lrm_iq
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	valid invalid		1
coordinates	lon_l1b_cal1_lrm_iq lat_l1b_cal1_lrm_iq			1
flag_diff_tx_rx_ku_l1b_cal1_lrm_iq	flag associated to the difference of travel between the Tx and Rx lines for ku band : l1b_cal1_lrm_iq mode		sc	time_l1b_cal1_lrm_iq
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	valid invalid		1
coordinates	lon_l1b_cal1_lrm_iq lat_l1b_cal1_lrm_iq			1
flag_diff_tx_rx_c_l1b_cal1_lrm_iq	flag associated to the difference of travel between the Tx and Rx lines for c band : l1b_cal1_lrm_iq mode		sc	time_l1b_cal1_lrm_iq
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	valid invalid		1
coordinates	lon_l1b_cal1_lrm_iq lat_l1b_cal1_lrm_iq			1
flag_freq_ptr_median_ku_l1b_cal1_lrm_iq	flag associated to the frequency of the median point of the PTR in energy for ku band : l1b_cal1_lrm_iq mode		sc	time_l1b_cal1_lrm_iq

flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	valid invalid		1
coordinates	lon_l1b_cal1_lrm_iq lat_l1b_cal1_lrm_iq			1
flag_freq_ptr_median_c_l1b_cal1_lrm_iq	flag associated to the frequency of the median point of the PTR in energy for c band : l1b_cal1_lrm_iq mode		sc	time_l1b_cal1_lrm_iq
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	valid invalid		1
coordinates	lon_l1b_cal1_lrm_iq lat_l1b_cal1_lrm_iq			1
ptr_main_width_ku_l1b_cal1_lrm_iq	width of the main lobe of the PTR at ufffd3 dB for ku band:l1b_cal1_lrm_iq mode		sl	time_l1b_cal1_lrm_iq
units	Unit name	Hz		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_cal1_lrm_iq lat_l1b_cal1_lrm_iq			1
ptr_main_width_c_l1b_cal1_lrm_iq	width of the main lobe of the PTR at ufffd3 dB for c band:l1b_cal1_lrm_iq mode		sl	time_l1b_cal1_lrm_iq
units	Unit name	Hz		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_cal1_lrm_iq lat_l1b_cal1_lrm_iq			1
flag_ptr_main_width_ku_l1b_cal1_lrm_iq	flag associated to the main lobe of the PTR at ufffd3 dB for ku band : l1b_cal1_lrm_iq mode		sc	time_l1b_cal1_lrm_iq
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	valid invalid		1
coordinates	lon_l1b_cal1_lrm_iq lat_l1b_cal1_lrm_iq			1
flag_ptr_main_width_c_l1b_cal1_lrm_iq	flag associated to the main lobe of the PTR at ufffd3 dB for c band : l1b_cal1_lrm_iq mode		sc	time_l1b_cal1_lrm_iq
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	valid invalid		1
coordinates	lon_l1b_cal1_lrm_iq lat_l1b_cal1_lrm_iq			1
ptr_sec_lobe_max_ku_l1b_cal1_lrm_iq	powers associated with the maxima of the secondary lobes of the PTR for ku band : l1b_cal1_lrm_iq mode		ul	time_l1b_cal1_lrm_iq ptr_sec_lobe_ind

scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	FFT power unit		1
_FillValue	Default value for unused or not computed elements	4294967295		1
ptr_sec_lobe_max_c_l1b_cal1_lrm_iq	powers associated with the maxima of the secondary lobes of the PTR for c band : l1b_cal1_lrm_iq mode		ul	time_l1b_cal1_lrm_iq ptr_sec_lobe_ind
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	FFT power unit		1
_FillValue	Default value for unused or not computed elements	4294967295		1
ptr_sec_lobe_pos_ku_l1b_cal1_lrm_iq	positions in freq. of the maxima of the secondary lobes of the PTR for ku band : l1b_cal1_lrm_iq mode		sl	time_l1b_cal1_lrm_iq ptr_sec_lobe_ind
units	Unit name	Hz		1
_FillValue	Default value for unused or not computed elements	2147483647		1
ptr_sec_lobe_pos_c_l1b_cal1_lrm_iq	positions in freq. of the maxima of the secondary lobes of the PTR for c band : l1b_cal1_lrm_iq mode		sl	time_l1b_cal1_lrm_iq ptr_sec_lobe_ind
units	Unit name	Hz		1
_FillValue	Default value for unused or not computed elements	2147483647		1
flag_ptr_sec_lobe_ku_l1b_cal1_lrm_iq	flags for the secondary lobes of the PTR for ku band : l1b_cal1_lrm_iq mode		sc	time_l1b_cal1_lrm_iq ptr_sec_lobe_ind
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	valid invalid		1
flag_ptr_sec_lobe_c_l1b_cal1_lrm_iq	flags for the secondary lobes of the PTR for c band : l1b_cal1_lrm_iq mode		sc	time_l1b_cal1_lrm_iq ptr_sec_lobe_ind
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	valid invalid		1
flag_ptr_likelihood_ku_l1b_cal1_lrm_iq	likelihood flag for all the secondary lobes of the PTR for ku band : l1b_cal1_lrm_iq mode		sc	time_l1b_cal1_lrm_iq
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	valid invalid		1

coordinates	lon_l1b_cal1_lrm_iq lat_l1b_cal1_lrm_iq			1
flag_ptr_likelihood_c_l1b_cal1_lrm_iq	likelihood flag for all the secondary lobes of the PTR for c band : l1b_cal1_lrm_iq mode		sc	time_l1b_cal1_lrm_iq
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	valid invalid		1
coordinates	lon_l1b_cal1_lrm_iq lat_l1b_cal1_lrm_iq			1

Table 5-20: Content of the Level 1 measurement data file (SR_1_CAL product) : CAL1_LRM parameters

5.1.4.4.2 CAL1_SAR_Norm

The content of the CAL1_SAR_Norm is described in the table below:

Element name	Description	Range or value	T	D
time_l1b_cal1_sar_norm	UTC : l1b_cal1_sar_norm mode		D	time_l1b_cal1_sar_norm
standard_name	Name of the physical quantity following the NetCDF Climate and Forecast (CF) Metadata Conventions	time		1
calendar		gregorian		1
units	Unit name	seconds since 2000-01-01 00:00:00.0		1
comment	value for the first burst of the first calibration cycle			1
UTC_day_l1b_cal1_sar_norm	day UTC : l1b_cal1_sar_norm mode		ss	time_l1b_cal1_sar_norm
units	Unit name	days since 2000-01-01 00:00:00.0		1
_FillValue	Default value for unused or not computed elements	32767		1
comment	value for the first burst of the first calibration cycle			1
UTC_sec_l1b_cal1_sar_norm	seconds in the day UTC : l1b_cal1_sar_norm mode		D	time_l1b_cal1_sar_norm
units	Unit name	s		1
_FillValue	Default value for unused or not computed elements	18446744073709551616		1
comment	value for the first burst of the first calibration cycle			1
GPS_time_l1b_cal1_sar_norm	GPS time : l1b_cal1_sar_norm mode		D	time_l1b_cal1_sar_norm
calendar		gregorian		1
units	Unit name	seconds since 1980-01-06 00:00:00.0		1
_FillValue	Default value for unused or not computed elements	18446744073709551616		1
comment	value for the first burst of the first calibration cycle			1
isp_coarse_time_l1b_cal1_sar_norm	ISP coarse time : l1b_cal1_sar_norm mode		ul	time_l1b_cal1_sar_norm
units	Unit name	second		1
_FillValue	Default value for unused or not computed elements	4294967295		1
comment	value for the first burst of the first calibration cycle			1
isp_fine_time_l1b_cal1_sar_norm	ISP fine time : l1b_cal1_sar_norm mode		sl	time_l1b_cal1_sar_norm
units	Unit name	2 ⁻²⁴ second		1
_FillValue	Default value for unused or not computed elements	2147483647		1
comment	value for the first burst of the first calibration cycle			1
sral_fine_time_l1b_cal1_sar_norm	ISP SRAL fine datation : l1b_cal1_sar_norm mode		ul	time_l1b_cal1_sar_norm

units	Unit name	137.5*10 ⁻⁹ second		1
_FillValue	Default value for unused or not computed elements	4294967295		1
comment	value for the first burst of the first calibration cycle			1
lat_l1b_cal1_sar_norm	latitude : l1b_cal1_sar_norm mode		sl	time_l1b_cal1_sar_norm
standard_name	Name of the physical quantity following the NetCDF Climate and Forecast (CF) Metadata Conventions	latitude		1
scale_factor	The data must be multiplied by this factor after reading	1.00e-06		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	degrees_north		1
_FillValue	Default value for unused or not computed elements	2147483647		1
comment	value for the first burst of the first calibration cycle			1
lon_l1b_cal1_sar_norm	longitude : l1b_cal1_sar_norm mode		sl	time_l1b_cal1_sar_norm
standard_name	Name of the physical quantity following the NetCDF Climate and Forecast (CF) Metadata Conventions	longitude		1
scale_factor	The data must be multiplied by this factor after reading	1.00e-06		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	degrees_east		1
_FillValue	Default value for unused or not computed elements	2147483647		1
comment	value for the first burst of the first calibration cycle			1
alt_l1b_cal1_sar_norm	altitude of satellite : l1b_cal1_sar_norm mode		sl	time_l1b_cal1_sar_norm
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	700000.		1
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_cal1_sar_norm lat_l1b_cal1_sar_norm			1
comment	value for the first burst of the first calibration cycle			1
orb_alt_rate_l1b_cal1_sar_norm	orbital altitude rate : l1b_cal1_sar_norm mode		ss	time_l1b_cal1_sar_norm
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	m/s		1
_FillValue	Default value for unused or not computed elements	32767		1
coordinates	lon_l1b_cal1_sar_norm lat_l1b_cal1_sar_norm			1

comment	value for the first burst of the first calibration cycle			1
flag_time_status_l1b_cal1_sar_norm	time status flag : l1b_cal1_sar_norm mode		sc	time_l1b_cal1_sar_norm
flag_values	Flag values	0b, 1b		1
comment	flag indicating if the time is synchronized or not with GPS time			1
flag_meanings	Flag meanings	synchronization no_synchronization		1
coordinates	lon_l1b_cal1_sar_norm lat_l1b_cal1_sar_norm			1
flag_time_corr_val_l1b_cal1_sar_norm	time correlation validity flag : l1b_cal1_sar_norm mode		sc	time_l1b_cal1_sar_norm
flag_values	Flag values	0b, 1b, 2b		1
comment	flag indicating if the time correlation information is valid provided by OBSW, valid provided by Ground Segment or invalid			1
flag_meanings	Flag meanings	valid_obs valid_ground_segment invalid		1
coordinates	lon_l1b_cal1_sar_norm lat_l1b_cal1_sar_norm			1
flag_man_pres_l1b_cal1_sar_norm	manoeuvre presence flag: l1b_cal1_sar_norm mode		sc	time_l1b_cal1_sar_norm
flag_values	Flag values	0b, 1b		1
flag_meanings	Flag meanings	no_manoeuvre ongoing_manoeuvre		1
coordinates	lon_l1b_cal1_sar_norm lat_l1b_cal1_sar_norm			1
flag_man_thrust_l1b_cal1_sar_norm	manoeuvre thrust flag: l1b_cal1_sar_norm mode		sc	time_l1b_cal1_sar_norm
flag_values	Flag values	0b, 1b		1
flag_meanings	Flag meanings	no_thrust ongoing_thrust		1
coordinates	lon_l1b_cal1_sar_norm lat_l1b_cal1_sar_norm			1
flag_man_plane_l1b_cal1_sar_norm	manoeuvre plane flag: l1b_cal1_sar_norm mode		sc	time_l1b_cal1_sar_norm
flag_values	Flag values	0b, 1b		1
flag_meanings	Flag meanings	in_plane out_of_plane		1
coordinates	lon_l1b_cal1_sar_norm lat_l1b_cal1_sar_norm			1
flag_gnss_status_l1b_cal1_sar_norm	validity flag for the navigation message from the gnss receiver: l1b_cal1_sar_norm mode		sc	time_l1b_cal1_sar_norm
comment	indicating if the navigation message from the GNSS receiver is valid or not valid/unavailable			1
flag_values	Flag values	0b, 1b		1
flag_meanings	Flag meanings	valid invalid_unavailable		1
coordinates	lon_l1b_cal1_sar_norm lat_l1b_cal1_sar_norm			1

seq_count_l1b_cal1_sar_norm	sequence count : l1b_cal1_sar_norm mode		us	time_l1b_cal1_sar_norm
_FillValue	Default value for unused or not computed elements	65535		1
coordinates	lon_l1b_cal1_sar_norm lat_l1b_cal1_sar_norm			1
isp_time_status_l1b_cal1_sar_norm	ISP time status : l1b_cal1_sar_norm mode		sc	time_l1b_cal1_sar_norm
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	SRAL_OBT_extrapolated SRAL_OBT_updated_with_SMU_OBT		1
coordinates	lon_l1b_cal1_sar_norm lat_l1b_cal1_sar_norm			1
oper_instr_l1b_cal1_sar_norm	operating instrument : l1b_cal1_sar_norm mode		sc	time_l1b_cal1_sar_norm
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	A B		1
coordinates	lon_l1b_cal1_sar_norm lat_l1b_cal1_sar_norm			1
comment	Instrument A stands for SRAL Nominal and instrument B stands for SRAL Redundant			1
ptr_pow_ku_l1b_cal1_sar_norm	total power of the PTR for ku band : l1b_cal1_sar_norm mode		ul	time_l1b_cal1_sar_norm
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	FFT power unit		1
_FillValue	Default value for unused or not computed elements	4294967295		1
coordinates	lon_l1b_cal1_sar_norm lat_l1b_cal1_sar_norm			1
ptr_pow_c_l1b_cal1_sar_norm	total power of the PTR for c band : l1b_cal1_sar_norm mode		ul	time_l1b_cal1_sar_norm
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	FFT power unit		1
_FillValue	Default value for unused or not computed elements	4294967295		1
coordinates	lon_l1b_cal1_sar_norm lat_l1b_cal1_sar_norm			1
ptr_max_ku_l1b_cal1_sar_norm	maximum value of the PTR for ku band : l1b_cal1_sar_norm mode		ul	time_l1b_cal1_sar_norm
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	FFT power unit		1

_FillValue	Default value for unused or not computed elements	4294967295		1
coordinates	lon_l1b_cal1_sar_norm lat_l1b_cal1_sar_norm			1
ptr_max_c_l1b_cal1_sar_norm	maximum value of the PTR for c band : l1b_cal1_sar_norm mode		ul	time_l1b_cal1_sar_norm
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	FFT power unit		1
_FillValue	Default value for unused or not computed elements	4294967295		1
coordinates	lon_l1b_cal1_sar_norm lat_l1b_cal1_sar_norm			1
freq_ptr_max_ku_l1b_cal1_sar_norm	frequency associated to the maximum of the PTR for ku band: l1b_cal1_sar_norm mode		sl	time_l1b_cal1_sar_norm
units	Unit name	Hz		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_cal1_sar_norm lat_l1b_cal1_sar_norm			1
freq_ptr_max_c_l1b_cal1_sar_norm	frequency associated to the maximum of the PTR for c band: l1b_cal1_sar_norm mode		sl	time_l1b_cal1_sar_norm
units	Unit name	Hz		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_cal1_sar_norm lat_l1b_cal1_sar_norm			1
dist_ptr_max_ku_l1b_cal1_sar_norm	distance associated with the maximum value of the PTR for ku band : l1b_cal1_sar_norm mode		ul	time_l1b_cal1_sar_norm
scale_factor	The data must be multiplied by this factor after reading	1.00e-06		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	4294967295		1
coordinates	lon_l1b_cal1_sar_norm lat_l1b_cal1_sar_norm			1
dist_ptr_max_c_l1b_cal1_sar_norm	distance associated with the maximum value of the PTR for c band : l1b_cal1_sar_norm mode		ul	time_l1b_cal1_sar_norm
scale_factor	The data must be multiplied by this factor after reading	1.00e-06		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	4294967295		1
coordinates	lon_l1b_cal1_sar_norm lat_l1b_cal1_sar_norm			1
freq_ptr_median_ku_l1b_cal1_sar_norm	frequency of the median point of the PTR for ku band:l1b_cal1_sar_norm mode		sl	time_l1b_cal1_sar_norm

units	Unit name	Hz		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_cal1_sar_norm lat_l1b_cal1_sar_norm			1
freq_ptr_median_c_l1b_cal1_sar_norm	frequency of the median point of the PTR for c band:l1b_cal1_sar_norm mode		sl	time_l1b_cal1_sar_norm
units	Unit name	Hz		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_cal1_sar_norm lat_l1b_cal1_sar_norm			1
diff_tx_rx_ku_l1b_cal1_sar_norm	difference of travel between the Tx and Rx lines for ku band:l1b_cal1_sar_norm mode		ul	time_l1b_cal1_sar_norm
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	4294967295		1
coordinates	lon_l1b_cal1_sar_norm lat_l1b_cal1_sar_norm			1
diff_tx_rx_c_l1b_cal1_sar_norm	difference of travel between the Tx and Rx lines for c band:l1b_cal1_sar_norm mode		ul	time_l1b_cal1_sar_norm
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	4294967295		1
coordinates	lon_l1b_cal1_sar_norm lat_l1b_cal1_sar_norm			1
flag_ptr_pow_ku_l1b_cal1_sar_norm	flag associated to the total power of the PTR for ku band : l1b_cal1_sar_norm mode		sc	time_l1b_cal1_sar_norm
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	valid invalid		1
coordinates	lon_l1b_cal1_sar_norm lat_l1b_cal1_sar_norm			1
flag_ptr_pow_c_l1b_cal1_sar_norm	flag associated to the total power of the PTR for c band : l1b_cal1_sar_norm mode		sc	time_l1b_cal1_sar_norm
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	valid invalid		1

coordinates	lon_l1b_cal1_sar_norm lat_l1b_cal1_sar_norm			1
flag_diff_tx_rx_ku_l1b_cal1_sar_norm	flag associated to the difference of travel between the Tx and Rx lines for ku band : l1b_cal1_sar_norm mode		sc	time_l1b_cal1_sar_norm
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	valid invalid		1
coordinates	lon_l1b_cal1_sar_norm lat_l1b_cal1_sar_norm			1
flag_diff_tx_rx_c_l1b_cal1_sar_norm	flag associated to the difference of travel between the Tx and Rx lines for c band : l1b_cal1_sar_norm mode		sc	time_l1b_cal1_sar_norm
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	valid invalid		1
coordinates	lon_l1b_cal1_sar_norm lat_l1b_cal1_sar_norm			1
flag_freq_ptr_median_ku_l1b_cal1_sar_norm	flag associated to the frequency of the median point of the PTR in energy for ku band : l1b_cal1_sar_norm mode		sc	time_l1b_cal1_sar_norm
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	valid invalid		1
coordinates	lon_l1b_cal1_sar_norm lat_l1b_cal1_sar_norm			1
flag_freq_ptr_median_c_l1b_cal1_sar_norm	flag associated to the frequency of the median point of the PTR in energy for c band : l1b_cal1_sar_norm mode		sc	time_l1b_cal1_sar_norm
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	valid invalid		1
coordinates	lon_l1b_cal1_sar_norm lat_l1b_cal1_sar_norm			1
ptr_main_width_ku_l1b_cal1_sar_norm	width of the main lobe of the PTR at uffd3 dB for ku band:l1b_cal1_sar_norm mode		sl	time_l1b_cal1_sar_norm
units	Unit name	Hz		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_cal1_sar_norm lat_l1b_cal1_sar_norm			1
ptr_main_width_c_l1b_cal1_sar_norm	width of the main lobe of the PTR at uffd3 dB for c band:l1b_cal1_sar_norm mode		sl	time_l1b_cal1_sar_norm
units	Unit name	Hz		1
_FillValue	Default value for unused or not computed elements	2147483647		1

coordinates	lon_l1b_cal1_sar_norm lat_l1b_cal1_sar_norm			1
flag_ptr_main_width_ku_l1b_cal1_sar_norm	flag associated to the main lobe of the PTR at ufffd3 dB for ku band : l1b_cal1_sar_norm mode		sc	time_l1b_cal1_sar_norm
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	valid invalid		1
coordinates	lon_l1b_cal1_sar_norm lat_l1b_cal1_sar_norm			1
flag_ptr_main_width_c_l1b_cal1_sar_norm	flag associated to the main lobe of the PTR at ufffd3 dB for c band : l1b_cal1_sar_norm mode		sc	time_l1b_cal1_sar_norm
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	valid invalid		1
coordinates	lon_l1b_cal1_sar_norm lat_l1b_cal1_sar_norm			1
ptr_sec_lobe_max_ku_l1b_cal1_sar_norm	powers associated with the maxima of the secondary lobes of the PTR for ku band : l1b_cal1_sar_norm mode		ul	time_l1b_cal1_sar_norm ptr_sec_lobe_ind
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	FFT power unit		1
_FillValue	Default value for unused or not computed elements	4294967295		1
ptr_sec_lobe_max_c_l1b_cal1_sar_norm	powers associated with the maxima of the secondary lobes of the PTR for c band : l1b_cal1_sar_norm mode		ul	time_l1b_cal1_sar_norm ptr_sec_lobe_ind
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	FFT power unit		1
_FillValue	Default value for unused or not computed elements	4294967295		1
ptr_sec_lobe_pos_ku_l1b_cal1_sar_norm	positions in freq. of the maxima of the secondary lobes of the PTR for ku band : l1b_cal1_sar_norm mode		sl	time_l1b_cal1_sar_norm ptr_sec_lobe_ind
units	Unit name	Hz		1
_FillValue	Default value for unused or not computed elements	2147483647		1
ptr_sec_lobe_pos_c_l1b_cal1_sar_norm	positions in freq. of the maxima of the secondary lobes of the PTR for c band : l1b_cal1_sar_norm mode		sl	time_l1b_cal1_sar_norm ptr_sec_lobe_ind
units	Unit name	Hz		1
_FillValue	Default value for unused or not computed elements	2147483647		1

flag_ptr_sec_lobe_ku_l1b_cal1_sar_norm	flags for the secondary lobes of the PTR for ku band : l1b_cal1_sar_norm mode		sc	time_l1b_cal1_sar_norm_ptr_sec_lobe_ind
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	valid invalid		1
flag_ptr_sec_lobe_c_l1b_cal1_sar_norm	flags for the secondary lobes of the PTR for c band : l1b_cal1_sar_norm mode		sc	time_l1b_cal1_sar_norm_ptr_sec_lobe_ind
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	valid invalid		1
flag_ptr_likelihood_ku_l1b_cal1_sar_norm	likelihood flag for all the secondary lobes of the PTR for ku band : l1b_cal1_sar_norm mode		sc	time_l1b_cal1_sar_norm
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	valid invalid		1
coordinates	lon_l1b_cal1_sar_norm lat_l1b_cal1_sar_norm			1
flag_ptr_likelihood_c_l1b_cal1_sar_norm	likelihood flag for all the secondary lobes of the PTR for c band : l1b_cal1_sar_norm mode		sc	time_l1b_cal1_sar_norm
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	valid invalid		1
coordinates	lon_l1b_cal1_sar_norm lat_l1b_cal1_sar_norm			1
burst_power_cor_l1b_cal1_sar_norm	burst power corrections : l1b_cal1_sar_norm mode		ul	time_l1b_cal1_sar_norm_sar_ku_pulse_burst_ind
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	FFT power unit		1
_FillValue	Default value for unused or not computed elements	4294967295		1
burst_phase_cor_l1b_cal1_sar_norm	burst phase corrections : l1b_cal1_sar_norm mode		sl	time_l1b_cal1_sar_norm_sar_ku_pulse_burst_ind
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1

units	Unit name	radian		1
_FillValue	Default value for unused or not computed elements	2147483647		1

Table 5-21: Content of the Level 1 measurement data file (SR_1_CAL product) : CAL1_SAR_Norm parameters

5.1.4.4.3 CAL1_SAR_Auto

The content of the CAL1_SAR_Auto is described in the table below:

Element name	Description	Range or value	T	D
time_l1b_cal1_sar_auto	UTC : l1b_cal1_sar_auto mode		D	time_l1b_cal1_sar_auto
standard_name	Name of the physical quantity following the NetCDF Climate and Forecast (CF) Metadata Conventions	time		1
calendar		gregorian		1
units	Unit name	seconds since 2000-01-01 00:00:00.0		1
comment	value for the first burst of the first calibration cycle			1
UTC_day_l1b_cal1_sar_auto	day UTC : l1b_cal1_sar_auto mode		ss	time_l1b_cal1_sar_auto
units	Unit name	days since 2000-01-01 00:00:00.0		1
_FillValue	Default value for unused or not computed elements	32767		1
comment	value for the first burst of the first calibration cycle			1
UTC_sec_l1b_cal1_sar_auto	seconds in the day UTC : l1b_cal1_sar_auto mode		D	time_l1b_cal1_sar_auto
units	Unit name	s		1
_FillValue	Default value for unused or not computed elements	18446744073709551616		1
comment	value for the first burst of the first calibration cycle			1
GPS_time_l1b_cal1_sar_auto	GPS time : l1b_cal1_sar_auto mode		D	time_l1b_cal1_sar_auto
calendar		gregorian		1
units	Unit name	seconds since 1980-01-06 00:00:00.0		1
_FillValue	Default value for unused or not computed elements	18446744073709551616		1
comment	value for the first burst of the first calibration cycle			1
isp_coarse_time_l1b_cal1_sar_auto	ISP coarse time : l1b_cal1_sar_auto mode		ul	time_l1b_cal1_sar_auto
units	Unit name	second		1
_FillValue	Default value for unused or not computed elements	4294967295		1

comment	value for the first burst of the first calibration cycle			1
isp_fine_time_l1b_cal1_sar_auto	ISP fine time : l1b_cal1_sar_auto mode		sl	time_l1b_cal1_sar_auto
units	Unit name	2^-24 second		1
_FillValue	Default value for unused or not computed elements	2147483647		1
comment	value for the first burst of the first calibration cycle			1
sral_fine_time_l1b_cal1_sar_auto	ISP SRAL fine datation : l1b_cal1_sar_auto mode		ul	time_l1b_cal1_sar_auto
units	Unit name	137.5*10^-9 second		1
_FillValue	Default value for unused or not computed elements	4294967295		1
comment	value for the first burst of the first calibration cycle			1
lat_l1b_cal1_sar_auto	latitude : l1b_cal1_sar_auto mode		sl	time_l1b_cal1_sar_auto
standard_name	Name of the physical quantity following the NetCDF Climate and Forecast (CF) Metadata Conventions	latitude		1
scale_factor	The data must be multiplied by this factor after reading	1.00e-06		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	degrees_north		1
_FillValue	Default value for unused or not computed elements	2147483647		1
lon_l1b_cal1_sar_auto	longitude : l1b_cal1_sar_auto mode		sl	time_l1b_cal1_sar_auto
standard_name	Name of the physical quantity following the NetCDF Climate and Forecast (CF) Metadata Conventions	longitude		1
scale_factor	The data must be multiplied by this factor after reading	1.00e-06		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	degrees_east		1
_FillValue	Default value for unused or not computed elements	2147483647		1
alt_l1b_cal1_sar_auto	altitude of satellite : l1b_cal1_sar_auto mode		sl	time_l1b_cal1_sar_auto
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	700000.		1
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_cal1_sar_auto lat_l1b_cal1_sar_auto			1
orb_alt_rate_l1b_cal1_sar_auto	orbital altitude rate : l1b_cal1_sar_auto mode		ss	time_l1b_cal1_sar_auto
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1

units	Unit name	m/s		1
_FillValue	Default value for unused or not computed elements	32767		1
coordinates	lon_l1b_cal1_sar_auto lat_l1b_cal1_sar_auto			1
flag_time_status_l1b_cal1_sar_auto	time status flag : l1b_cal1_sar_auto mode		sc	time_l1b_cal1_sar_auto
flag_values	Flag values	0b, 1b		1
comment	flag indicating if the time is synchronized or not with GPS time			1
flag_meanings	Flag meanings	synchronization no_synchronization		1
coordinates	lon_l1b_cal1_sar_auto lat_l1b_cal1_sar_auto			1
flag_time_corr_val_l1b_cal1_sar_auto	time correlation validity flag : l1b_cal1_sar_auto mode		sc	time_l1b_cal1_sar_auto
flag_values	Flag values	0b, 1b, 2b		1
comment	flag indicating if the time correlation information is valid provided by OBSW, valid provided by Ground Segment or invalid			1
flag_meanings	Flag meanings	valid_obsw valid_ground_segment invalid		1
coordinates	lon_l1b_cal1_sar_auto lat_l1b_cal1_sar_auto			1
flag_man_pres_l1b_cal1_sar_auto	manoeuvre presence flag: l1b_cal1_sar_auto mode		sc	time_l1b_cal1_sar_auto
flag_values	Flag values	0b, 1b		1
flag_meanings	Flag meanings	no_manoeuvre ongoing_manoeuvre		1
coordinates	lon_l1b_cal1_sar_auto lat_l1b_cal1_sar_auto			1
flag_man_thrust_l1b_cal1_sar_auto	manoeuvre thrust flag: l1b_cal1_sar_auto mode		sc	time_l1b_cal1_sar_auto
flag_values	Flag values	0b, 1b		1
flag_meanings	Flag meanings	no_thrust ongoing_thrust		1
coordinates	lon_l1b_cal1_sar_auto lat_l1b_cal1_sar_auto			1
flag_man_plane_l1b_cal1_sar_auto	manoeuvre plane flag: l1b_cal1_sar_auto mode		sc	time_l1b_cal1_sar_auto
flag_values	Flag values	0b, 1b		1
flag_meanings	Flag meanings	in_plane out_of_plane		1
coordinates	lon_l1b_cal1_sar_auto lat_l1b_cal1_sar_auto			1
flag_gnss_status_l1b_cal1_sar_auto	validity flag for the navigation message from the gnss receiver: l1b_cal1_sar_auto mode		sc	time_l1b_cal1_sar_auto
comment	indicating if the navigation message from the GNSS receiver is valid or not valid/available			1
flag_values	Flag values	0b, 1b		1

flag_meanings	Flag meanings	valid invalid_unavailable		1
coordinates	lon_l1b_cal1_sar_auto lat_l1b_cal1_sar_auto			1
seq_count_l1b_cal1_sar_auto	sequence count : l1b_cal1_sar_auto mode		us	time_l1b_cal1_sar_auto
_FillValue	Default value for unused or not computed elements	65535		1
coordinates	lon_l1b_cal1_sar_auto lat_l1b_cal1_sar_auto			1
comment	value for the first burst of the first calibration cycle			1
isp_time_status_l1b_cal1_sar_auto	ISP time status : l1b_cal1_sar_auto mode		sc	time_l1b_cal1_sar_auto
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	SRAL_OBT_extrapolated SRAL_OBT_updated_with_SMU_OBT		1
coordinates	lon_l1b_cal1_sar_auto lat_l1b_cal1_sar_auto			1
comment	value for the first burst of the first calibration cycle			1
oper_instr_l1b_cal1_sar_auto	operating instrument : l1b_cal1_sar_auto mode		sc	time_l1b_cal1_sar_auto
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	A B		1
coordinates	lon_l1b_cal1_sar_auto lat_l1b_cal1_sar_auto			1
comment	value for the first burst of the first calibration cycle - Instrument A stands for SRAL Nominal and instrument B stands for SRAL Redundant			1
agc_ref_ku_l1b_cal1_sar_auto	AGC reference values ufffd Ku band : l1b_cal1_sar_auto mode		ss	time_l1b_cal1_sar_auto agc_ind
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
_FillValue	Default value for unused or not computed elements	32767		1
coordinates	lon_l1b_cal1_sar_auto lat_l1b_cal1_sar_auto			1
agc_cor_ku_l1b_cal1_sar_auto	AGC corrected values ufffd Ku band : l1b_cal1_sar_auto mode		ss	time_l1b_cal1_sar_auto agc_ind
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1

_FillValue	Default value for unused or not computed elements	32767		1
coordinates	lon_l1b_cal1_sar_auto lat_l1b_cal1_sar_auto			1
agc_ref_c_l1b_cal1_sar_auto	AGC reference values uffd C band : l1b_cal1_sar_auto mode		ss	time_l1b_cal1_sar_auto agc_ind
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
_FillValue	Default value for unused or not computed elements	32767		1
coordinates	lon_l1b_cal1_sar_auto lat_l1b_cal1_sar_auto			1
agc_cor_c_l1b_cal1_sar_auto	AGC corrected values uffd C band : l1b_cal1_sar_auto mode		ss	time_l1b_cal1_sar_auto agc_ind
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
_FillValue	Default value for unused or not computed elements	32767		1
coordinates	lon_l1b_cal1_sar_auto lat_l1b_cal1_sar_auto			1
switch_att_ku_l1b_cal1_sar_auto	ku band ku/c switch attenuation : l1b_cal1_sar_auto mode		ss	time_l1b_cal1_sar_auto
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
_FillValue	Default value for unused or not computed elements	32767		1
coordinates	lon_l1b_cal1_sar_auto lat_l1b_cal1_sar_auto			1
switch_att_c_l1b_cal1_sar_auto	c band ku/c switch attenuation : l1b_cal1_sar_auto mode		ss	time_l1b_cal1_sar_auto
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
_FillValue	Default value for unused or not computed elements	32767		1
coordinates	lon_l1b_cal1_sar_auto lat_l1b_cal1_sar_auto			1

Table 5-22: Content of the Level 1 measurement data file (SR_1_CAL product) : CAL1_SAR_Auto parameters

5.1.4.4.4 CAL2_SAR_Ku

The content of the CAL2_SAR_Ku is described in the table below:

Element name	Description	Range or value	T	D
time_l1b_cal2_sar_ku	UTC : l1b_cal2_sar_ku mode		D	time_l1b_cal2_sar_ku
standard_name	Name of the physical quantity following the NetCDF Climate and Forecast (CF) Metadata Conventions	time		1
calendar		gregorian		1
units	Unit name	seconds since 2000-01-01 00:00:00.0		1
comment	value for the first burst of the first calibration cycle			1
UTC_day_l1b_cal2_sar_ku	day UTC : l1b_cal2_sar_ku mode		ss	time_l1b_cal2_sar_ku
units	Unit name	days since 2000-01-01 00:00:00.0		1
_FillValue	Default value for unused or not computed elements	32767		1
comment	value for the first burst of the first calibration cycle			1
UTC_sec_l1b_cal2_sar_ku	seconds in the day UTC : l1b_cal2_sar_ku mode		D	time_l1b_cal2_sar_ku
units	Unit name	s		1
_FillValue	Default value for unused or not computed elements	18446744073709551616		1
comment	value for the first burst of the first calibration cycle			1
GPS_time_l1b_cal2_sar_ku	GPS time : l1b_cal2_sar_ku mode		D	time_l1b_cal2_sar_ku
calendar		gregorian		1
units	Unit name	seconds since 1980-01-06 00:00:00.0		1
_FillValue	Default value for unused or not computed elements	18446744073709551616		1
comment	value for the first burst of the first calibration cycle			1
isp_coarse_time_l1b_cal2_sar_ku	ISP coarse time : l1b_cal2_sar_ku mode		ul	time_l1b_cal2_sar_ku
units	Unit name	second		1
_FillValue	Default value for unused or not computed elements	4294967295		1
comment	value for the first burst of the first calibration cycle			1
isp_fine_time_l1b_cal2_sar_ku	ISP fine time : l1b_cal2_sar_ku mode		sl	time_l1b_cal2_sar_ku
units	Unit name	2 ⁻²⁴ second		1
_FillValue	Default value for unused or not computed elements	2147483647		1

comment	value for the first burst of the first calibration cycle			1
sral_fine_time_l1b_cal2_sar_ku	ISP SRAL fine datation : l1b_cal2_sar_ku mode		ul	time_l1b_cal2_sar_ku
units	Unit name	137.5*10 ⁻⁹ second		1
_FillValue	Default value for unused or not computed elements	4294967295		1
comment	value for the first burst of the first calibration cycle			1
lat_l1b_cal2_sar_ku	latitude : l1b_cal2_sar_ku mode		sl	time_l1b_cal2_sar_ku
standard_name	Name of the physical quantity following the NetCDF Climate and Forecast (CF) Metadata Conventions	latitude		1
scale_factor	The data must be multiplied by this factor after reading	1.00e-06		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	degrees_north		1
_FillValue	Default value for unused or not computed elements	2147483647		1
comment	value for the first burst of the first calibration cycle			1
lon_l1b_cal2_sar_ku	longitude : l1b_cal2_sar_ku mode		sl	time_l1b_cal2_sar_ku
standard_name	Name of the physical quantity following the NetCDF Climate and Forecast (CF) Metadata Conventions	longitude		1
scale_factor	The data must be multiplied by this factor after reading	1.00e-06		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	degrees_east		1
_FillValue	Default value for unused or not computed elements	2147483647		1
comment	value for the first burst of the first calibration cycle			1
alt_l1b_cal2_sar_ku	altitude of satellite : l1b_cal2_sar_ku mode		sl	time_l1b_cal2_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	700000.		1
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_cal2_sar_ku lat_l1b_cal2_sar_ku			1
comment	value for the first burst of the first calibration cycle			1
orb_alt_rate_l1b_cal2_sar_ku	orbital altitude rate : l1b_cal2_sar_ku mode		ss	time_l1b_cal2_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	m/s		1

_FillValue	Default value for unused or not computed elements	32767		1
coordinates	lon_l1b_cal2_sar_ku lat_l1b_cal2_sar_ku			1
comment	value for the first burst of the first calibration cycle			1
flag_time_status_l1b_cal2_sar_ku	time status flag : l1b_cal2_sar_ku mode		sc	time_l1b_cal2_sar_ku
flag_values	Flag values	0b, 1b		1
comment	flag indicating if the time is synchronized or not with GPS time			1
flag_meanings	Flag meanings	synchronization no_synchronization		1
coordinates	lon_l1b_cal2_sar_ku lat_l1b_cal2_sar_ku			1
flag_time_corr_val_l1b_cal2_sar_ku	time correlation validity flag : l1b_cal2_sar_ku mode		sc	time_l1b_cal2_sar_ku
flag_values	Flag values	0b, 1b, 2b		1
comment	flag indicating if the time correlation information is valid provided by OBSW, valid provided by Ground Segment or invalid			1
flag_meanings	Flag meanings	valid_obsw valid_ground_segment invalid		1
coordinates	lon_l1b_cal2_sar_ku lat_l1b_cal2_sar_ku			1
flag_man_pres_l1b_cal2_sar_ku	manoeuvre presence flag: l1b_cal2_sar_ku mode		sc	time_l1b_cal2_sar_ku
flag_values	Flag values	0b, 1b		1
flag_meanings	Flag meanings	no_manoeuvre ongoing_manoeuvre		1
coordinates	lon_l1b_cal2_sar_ku lat_l1b_cal2_sar_ku			1
flag_man_thrust_l1b_cal2_sar_ku	manoeuvre thrust flag: l1b_cal2_sar_ku mode		sc	time_l1b_cal2_sar_ku
flag_values	Flag values	0b, 1b		1
flag_meanings	Flag meanings	no_thrust ongoing_thrust		1
coordinates	lon_l1b_cal2_sar_ku lat_l1b_cal2_sar_ku			1
flag_man_plane_l1b_cal2_sar_ku	manoeuvre plane flag: l1b_cal2_sar_ku mode		sc	time_l1b_cal2_sar_ku
flag_values	Flag values	0b, 1b		1
flag_meanings	Flag meanings	in_plane out_of_plane		1
coordinates	lon_l1b_cal2_sar_ku lat_l1b_cal2_sar_ku			1
flag_gnss_status_l1b_cal2_sar_ku	validity flag for the navigation message from the gnss receiver: l1b_cal2_sar_ku mode		sc	time_l1b_cal2_sar_ku
comment	indicating if the navigation message from the GNSS receiver is valid or not valid/available			1
flag_values	Flag values	0b, 1b		1

flag_meanings	Flag meanings	valid invalid_unavailable		1
coordinates	lon_l1b_cal2_sar_ku lat_l1b_cal2_sar_ku			1
seq_count_l1b_cal2_sar_ku	sequence count : l1b_cal2_sar_ku mode		us	time_l1b_cal2_sar_ku
_FillValue	Default value for unused or not computed elements	65535		1
coordinates	lon_l1b_cal2_sar_ku lat_l1b_cal2_sar_ku			1
comment	value for the first burst of the first calibration cycle			1
isp_time_status_l1b_cal2_sar_ku	ISP time status : l1b_cal2_sar_ku mode		sc	time_l1b_cal2_sar_ku
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	SRAL_OBT_extrapolated SRAL_OBT_updated_with_SMU_OBT		1
coordinates	lon_l1b_cal2_sar_ku lat_l1b_cal2_sar_ku			1
comment	value for the first burst of the first calibration cycle			1
oper_instr_l1b_cal2_sar_ku	operating instrument : l1b_cal2_sar_ku mode		sc	time_l1b_cal2_sar_ku
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	A B		1
coordinates	lon_l1b_cal2_sar_ku lat_l1b_cal2_sar_ku			1
comment	value for the first burst of the first calibration cycle - Instrument A stands for SRAL Nominal and instrument B stands for SRAL Redundant			1
gprw_mean_left_l1b_cal2_sar_ku	mean value of the left side of the GPRW: l1b_cal2_sar_ku mode		ss	time_l1b_cal2_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
_FillValue	Default value for unused or not computed elements	32767		1
flag_gprw_mean_left_l1b_cal2_sar_ku	flag associated to the mean value of the left side of the GPRW: l1b_cal2_sar_ku mode		sc	time_l1b_cal2_sar_ku
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	valid invalid		1
gprw_mean_right_l1b_cal2_sar_ku	mean value of the right side of the GPRW: l1b_cal2_sar_ku mode		ss	time_l1b_cal2_sar_ku

scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
_FillValue	Default value for unused or not computed elements	32767		1
flag_gprw_mean_right_l1b_cal2_sar_ku	flag associated to the mean value of the right side of the GPRW: l1b_cal2_sar_ku mode		sc	time_l1b_cal2_sar_ku
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	valid invalid		1
gprw_stdev_left_l1b_cal2_sar_ku	standard deviation of the left side of the GPRW: l1b_cal2_sar_ku mode		us	time_l1b_cal2_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
_FillValue	Default value for unused or not computed elements	65535		1
flag_gprw_stdev_left_l1b_cal2_sar_ku	flag associated to the standard deviation of the left side of the GPRW: l1b_cal2_sar_ku mode		sc	time_l1b_cal2_sar_ku
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	valid invalid		1
gprw_stdev_right_l1b_cal2_sar_ku	standard deviation of the right side of the GPRW: l1b_cal2_sar_ku mode		us	time_l1b_cal2_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
_FillValue	Default value for unused or not computed elements	65535		1
flag_gprw_stdev_right_l1b_cal2_sar_ku	flag associated to the standard deviation of the right side of the GPRW: l1b_cal2_sar_ku mode		sc	time_l1b_cal2_sar_ku
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	valid invalid		1
gprw_diff_left_l1b_cal2_sar_ku	difference between the min and max values of the left side of the GPRW: l1b_cal2_sar_ku mode		ss	time_l1b_cal2_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1

add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
_FillValue	Default value for unused or not computed elements	32767		1
flag_gprw_diff_left_l1b_cal2_sar_ku	flag associated to the difference between the min and max values of the left side of the GPRW: l1b_cal2_sar_ku mode		sc	time_l1b_cal2_sar_ku
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	valid invalid		1
gprw_diff_right_l1b_cal2_sar_ku	difference between the min and max values of the right side of the GPRW: l1b_cal2_sar_ku mode		ss	time_l1b_cal2_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
_FillValue	Default value for unused or not computed elements	32767		1
flag_gprw_diff_right_l1b_cal2_sar_ku	flag associated to the difference between the min and max values of the right side of the GPRW: l1b_cal2_sar_ku mode		sc	time_l1b_cal2_sar_ku
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	valid invalid		1
gprw_slope_left_l1b_cal2_sar_ku	slope of the linear regression of the left side of the GPRW: l1b_cal2_sar_ku mode		sl	time_l1b_cal2_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-08		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB /Hz		1
_FillValue	Default value for unused or not computed elements	2147483647		1
flag_gprw_slope_left_l1b_cal2_sar_ku	flag associated to the slope of the linear regression of the left side of the GPRW: l1b_cal2_sar_ku mode		sc	time_l1b_cal2_sar_ku
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	valid invalid		1
gprw_slope_right_l1b_cal2_sar_ku	slope of the linear regression of the right side of the GPRW: l1b_cal2_sar_ku mode		sl	time_l1b_cal2_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-08		1

add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB /Hz		1
_FillValue	Default value for unused or not computed elements	2147483647		1
flag_gprw_slope_right_l1b_cal2_sar_ku	flag associated to the slope of the linear regression of the right side of the GPRW: l1b_cal2_sar_ku mode		sc	time_l1b_cal2_sar_ku
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	valid invalid		1
gprw_stdev_slope_left_l1b_cal2_sar_ku	standard deviation value about the slope of the linear regression of the left side of the GPRW: l1b_cal2_sar_ku mode		us	time_l1b_cal2_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
_FillValue	Default value for unused or not computed elements	65535		1
flag_gprw_stdev_slope_left_l1b_cal2_sar_ku	flag associated to the standard deviation value about the slope of the linear regression of the left side of the GPRW: l1b_cal2_sar_ku mode		sc	time_l1b_cal2_sar_ku
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	valid invalid		1
gprw_stdev_slope_right_l1b_cal2_sar_ku	standard deviation value about the slope of the linear regression of the right side of the GPRW: l1b_cal2_sar_ku mode		us	time_l1b_cal2_sar_ku
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
_FillValue	Default value for unused or not computed elements	65535		1
flag_gprw_stdev_slope_right_l1b_cal2_sar_ku	flag associated to the standard deviation value about the slope of the linear regression of the right side of the GPRW: l1b_cal2_sar_ku mode		sc	time_l1b_cal2_sar_ku
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	valid invalid		1
gprw_max_loc_l1b_cal2_sar_ku	localization of the max. of the GPRW: l1b_cal2_sar_ku mode		sl	time_l1b_cal2_sar_ku
units	Unit name	Hz		1

_FillValue	Default value for unused or not computed elements	2147483647		1
gprw_meas_l1b_cal2_sar_ku	samples of the normalized GPRW: l1b_cal2_sar_ku mode		ul	time_l1b_cal2_sar_ku echo_sample_ind
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	FFT power unit		1
comment	Normalized GPRW for waveforms correction. For the correction of the I/Q waveforms by the GPRW in frequency domain, the zero-frequency gate of the waveform to be applied is 63 (0-based indexing).			1
_FillValue	Default value for unused or not computed elements	4294967295		1

Table 5-23: Content of the Level 1 measurement data file (SR_1_CAL product) : CAL2_SAR_Ku parameters

5.1.4.4.5 CAL2_SAR_C

The content of the CAL2_SAR_C is described in the table below:

Element name	Description	Range or value	T	D
time_l1b_cal2_sar_c	UTC : l1b_cal2_sar_c mode		D	time_l1b_cal2_sar_c
standard_name	Name of the physical quantity following the NetCDF Climate and Forecast (CF) Metadata Conventions	time		1
calendar		gregorian		1
units	Unit name	seconds since 2000-01-01 00:00:00.0		1
UTC_day_l1b_cal2_sar_c	day UTC : l1b_cal2_sar_c mode		ss	time_l1b_cal2_sar_c
units	Unit name	days since 2000-01-01 00:00:00.0		1
_FillValue	Default value for unused or not computed elements	32767		1
UTC_sec_l1b_cal2_sar_c	seconds in the day UTC : l1b_cal2_sar_c mode		D	time_l1b_cal2_sar_c
units	Unit name	s		1
_FillValue	Default value for unused or not computed elements	18446744073709551616		1
GPS_time_l1b_cal2_sar_c	GPS time : l1b_cal2_sar_c mode		D	time_l1b_cal2_sar_c
calendar		gregorian		1
units	Unit name	seconds since 1980-01-06 00:00:00.0		1

_FillValue	Default value for unused or not computed elements	18446744073709551616		1
isp_coarse_time_l1b_cal2_sar_c	ISP coarse time : l1b_cal2_sar_c mode		ul	time_l1b_cal2_sar_c
units	Unit name	second		1
_FillValue	Default value for unused or not computed elements	4294967295		1
isp_fine_time_l1b_cal2_sar_c	ISP fine time : l1b_cal2_sar_c mode		sl	time_l1b_cal2_sar_c
units	Unit name	2 ²⁴ second		1
_FillValue	Default value for unused or not computed elements	2147483647		1
sral_fine_time_l1b_cal2_sar_c	ISP SRAL fine datation : l1b_cal2_sar_c mode		ul	time_l1b_cal2_sar_c
units	Unit name	137.5*10 ⁻⁹ second		1
_FillValue	Default value for unused or not computed elements	4294967295		1
lat_l1b_cal2_sar_c	latitude : l1b_cal2_sar_c mode		sl	time_l1b_cal2_sar_c
standard_name	Name of the physical quantity following the NetCDF Climate and Forecast (CF) Metadata Conventions	latitude		1
scale_factor	The data must be multiplied by this factor after reading	1.00e-06		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	degrees_north		1
_FillValue	Default value for unused or not computed elements	2147483647		1
lon_l1b_cal2_sar_c	longitude : l1b_cal2_sar_c mode		sl	time_l1b_cal2_sar_c
standard_name	Name of the physical quantity following the NetCDF Climate and Forecast (CF) Metadata Conventions	longitude		1
scale_factor	The data must be multiplied by this factor after reading	1.00e-06		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	degrees_east		1
_FillValue	Default value for unused or not computed elements	2147483647		1
alt_l1b_cal2_sar_c	altitude of satellite : l1b_cal2_sar_c mode		sl	time_l1b_cal2_sar_c
scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	700000.		1
units	Unit name	m		1
_FillValue	Default value for unused or not computed elements	2147483647		1
coordinates	lon_l1b_cal2_sar_c lat_l1b_cal2_sar_c			1
orb_alt_rate_l1b_cal2_sar_c	orbital altitude rate : l1b_cal2_sar_c mode		ss	time_l1b_cal2_sar_c
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1

add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	m/s		1
_FillValue	Default value for unused or not computed elements	32767		1
coordinates	lon_l1b_cal2_sar_c lat_l1b_cal2_sar_c			1
flag_time_status_l1b_cal2_sar_c	time status flag : l1b_cal2_sar_c mode		sc	time_l1b_cal2_sar_c
flag_values	Flag values	0b, 1b		1
comment	flag indicating if the time is synchronized or not with GPS time			1
flag_meanings	Flag meanings	synchronization no_synchronization		1
coordinates	lon_l1b_cal2_sar_c lat_l1b_cal2_sar_c			1
flag_time_corr_val_l1b_cal2_sar_c	time correlation validity flag : l1b_cal2_sar_c mode		sc	time_l1b_cal2_sar_c
flag_values	Flag values	0b, 1b, 2b		1
comment	flag indicating if the time correlation information is valid provided by OBSW, valid provided by Ground Segment or invalid			1
flag_meanings	Flag meanings	valid_obsw valid_ground_segment invalid		1
coordinates	lon_l1b_cal2_sar_c lat_l1b_cal2_sar_c			1
flag_man_pres_l1b_cal2_sar_c	manoeuvre presence flag: l1b_cal2_sar_c mode		sc	time_l1b_cal2_sar_c
flag_values	Flag values	0b, 1b		1
flag_meanings	Flag meanings	no_manoeuvre ongoing_manoeuvre		1
coordinates	lon_l1b_cal2_sar_c lat_l1b_cal2_sar_c			1
flag_man_thrust_l1b_cal2_sar_c	manoeuvre thrust flag: l1b_cal2_sar_c mode		sc	time_l1b_cal2_sar_c
flag_values	Flag values	0b, 1b		1
flag_meanings	Flag meanings	no_thrust ongoing_thrust		1
coordinates	lon_l1b_cal2_sar_c lat_l1b_cal2_sar_c			1
flag_man_plane_l1b_cal2_sar_c	manoeuvre plane flag: l1b_cal2_sar_c mode		sc	time_l1b_cal2_sar_c
flag_values	Flag values	0b, 1b		1
flag_meanings	Flag meanings	in_plane out_of_plane		1
coordinates	lon_l1b_cal2_sar_c lat_l1b_cal2_sar_c			1
flag_gnss_status_l1b_cal2_sar_c	validity flag for the navigation message from the gnss receiver: l1b_cal2_sar_c mode		sc	time_l1b_cal2_sar_c
comment	indicating if the navigation message from the GNSS receiver is valid or not valid/available			1

flag_values	Flag values	0b, 1b		1
flag_meanings	Flag meanings	valid invalid_unavailable		1
coordinates	lon_l1b_cal2_sar_c lat_l1b_cal2_sar_c			1
seq_count_l1b_cal2_sar_c	sequence count : l1b_cal2_sar_c mode		us	time_l1b_cal2_sar_c
_FillValue	Default value for unused or not computed elements	65535		1
coordinates	lon_l1b_cal2_sar_c lat_l1b_cal2_sar_c			1
isp_time_status_l1b_cal2_sar_c	ISP time status : l1b_cal2_sar_c mode		sc	time_l1b_cal2_sar_c
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	SRAL_OBT_extrapolated SRAL_OBT_updated_with_SMU_OBT		1
coordinates	lon_l1b_cal2_sar_c lat_l1b_cal2_sar_c			1
oper_instr_l1b_cal2_sar_c	operating instrument : l1b_cal2_sar_c mode		sc	time_l1b_cal2_sar_c
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	A B		1
coordinates	lon_l1b_cal2_sar_c lat_l1b_cal2_sar_c			1
comment	Instrument A stands for SRAL Nominal and instrument B stands for SRAL Redundant			1
gprw_mean_left_l1b_cal2_sar_c	mean value of the left side of the GPRW: l1b_cal2_sar_c mode		ss	time_l1b_cal2_sar_c
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
_FillValue	Default value for unused or not computed elements	32767		1
flag_gprw_mean_left_l1b_cal2_sar_c	flag associated to the mean value of the left side of the GPRW: l1b_cal2_sar_c mode		sc	time_l1b_cal2_sar_c
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	valid invalid		1
gprw_mean_right_l1b_cal2_sar_c	mean value of the right side of the GPRW: l1b_cal2_sar_c mode		ss	time_l1b_cal2_sar_c
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1

units	Unit name	dB		1
_FillValue	Default value for unused or not computed elements	32767		1
flag_gprw_mean_right_l1b_cal2_sar_c	flag associated to the mean value of the right side of the GPRW: l1b_cal2_sar_c mode		sc	time_l1b_cal2_sar_c
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	valid invalid		1
gprw_stdev_left_l1b_cal2_sar_c	standard deviation of the left side of the GPRW: l1b_cal2_sar_c mode		us	time_l1b_cal2_sar_c
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
_FillValue	Default value for unused or not computed elements	65535		1
flag_gprw_stdev_left_l1b_cal2_sar_c	flag associated to the standard deviation of the left side of the GPRW: l1b_cal2_sar_c mode		sc	time_l1b_cal2_sar_c
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	valid invalid		1
gprw_stdev_right_l1b_cal2_sar_c	standard deviation of the right side of the GPRW: l1b_cal2_sar_c mode		us	time_l1b_cal2_sar_c
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
_FillValue	Default value for unused or not computed elements	65535		1
flag_gprw_stdev_right_l1b_cal2_sar_c	flag associated to the standard deviation of the right side of the GPRW: l1b_cal2_sar_c mode		sc	time_l1b_cal2_sar_c
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	valid invalid		1
gprw_diff_left_l1b_cal2_sar_c	difference between the min and max values of the left side of the GPRW: l1b_cal2_sar_c mode		ss	time_l1b_cal2_sar_c
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1

_FillValue	Default value for unused or not computed elements	32767		1
flag_gprw_diff_left_l1b_cal2_sar_c	flag associated to the difference between the min and max values of the left side of the GPRW: l1b_cal2_sar_c mode		sc	time_l1b_cal2_sar_c
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	valid invalid		1
gprw_diff_right_l1b_cal2_sar_c	difference between the min and max values of the right side of the GPRW: l1b_cal2_sar_c mode		ss	time_l1b_cal2_sar_c
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
_FillValue	Default value for unused or not computed elements	32767		1
flag_gprw_diff_right_l1b_cal2_sar_c	flag associated to the difference between the min and max values of the right side of the GPRW: l1b_cal2_sar_c mode		sc	time_l1b_cal2_sar_c
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	valid invalid		1
gprw_slope_left_l1b_cal2_sar_c	slope of the linear regression of the left side of the GPRW: l1b_cal2_sar_c mode		sl	time_l1b_cal2_sar_c
scale_factor	The data must be multiplied by this factor after reading	1.00e-08		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB /Hz		1
_FillValue	Default value for unused or not computed elements	2147483647		1
flag_gprw_slope_left_l1b_cal2_sar_c	flag associated to the slope of the linear regression of the left side of the GPRW: l1b_cal2_sar_c mode		sc	time_l1b_cal2_sar_c
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	valid invalid		1
gprw_slope_right_l1b_cal2_sar_c	slope of the linear regression of the right side of the GPRW: l1b_cal2_sar_c mode		sl	time_l1b_cal2_sar_c
scale_factor	The data must be multiplied by this factor after reading	1.00e-08		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB /Hz		1

_FillValue	Default value for unused or not computed elements	2147483647		1
flag_gprw_slope_right_l1b_cal2_sar_c	flag associated to the slope of the linear regression of the right side of the GPRW: l1b_cal2_sar_c mode		sc	time_l1b_cal2_sar_c
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	valid invalid		1
gprw_stdev_slope_left_l1b_cal2_sar_c	standard deviation value about the slope of the linear regression of the left side of the GPRW: l1b_cal2_sar_c mode		us	time_l1b_cal2_sar_c
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
_FillValue	Default value for unused or not computed elements	65535		1
flag_gprw_stdev_slope_left_l1b_cal2_sar_c	flag associated to the standard deviation value about the slope of the linear regression of the left side of the GPRW: l1b_cal2_sar_c mode		sc	time_l1b_cal2_sar_c
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	valid invalid		1
gprw_stdev_slope_right_l1b_cal2_sar_c	standard deviation value about the slope of the linear regression of the right side of the GPRW: l1b_cal2_sar_c mode		us	time_l1b_cal2_sar_c
scale_factor	The data must be multiplied by this factor after reading	1.00e-02		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	dB		1
_FillValue	Default value for unused or not computed elements	65535		1
flag_gprw_stdev_slope_right_l1b_cal2_sar_c	flag associated to the standard deviation value about the slope of the linear regression of the right side of the GPRW: l1b_cal2_sar_c mode		sc	time_l1b_cal2_sar_c
flag_values	Flag values	0b, 1b		1
_FillValue	Default value for unused or not computed elements	127		1
flag_meanings	Flag meanings	valid invalid		1
gprw_max_loc_l1b_cal2_sar_c	localization of the max. of the GPRW: l1b_cal2_sar_c mode		sl	time_l1b_cal2_sar_c
units	Unit name	Hz		1
_FillValue	Default value for unused or not computed elements	2147483647		1
gprw_meas_l1b_cal2_sar_c	samples of the normalized GPRW: l1b_cal2_sar_c mode		ul	time_l1b_cal2_sar_c echo_sample_ind

scale_factor	The data must be multiplied by this factor after reading	1.00e-04		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
units	Unit name	FFT power unit		1
comment	Normalized GPRW for waveforms correction. For the correction of the I/Q waveforms by the GPRW in frequency domain, the zero-frequency gate of the waveform to be applied is 63 (0-based indexing).			1
_FillValue	Default value for unused or not computed elements	4294967295		1

Table 5-24: Content of the Level 1 measurement data file (SR_1_CAL product) : CAL2_SAR_C parameters

5.1.5 MWR “MW_1_MWR___”

A Level 1 MWR product contains one "measurement data file" containing the measurements data.

5.1.5.1 Product summary

Product Package Type MW_1_MWR___		<i>Description</i> MWR Level 1 observation data			
Product Level	Diss. Timeliness	Product Category	Application Domain		Spatial Resolution
1	NRT/STC/NTC	Not Available to the user	LAN WAT		
Product Dissemination Unit N/A		Number of Package Components	Number of Measurement Data Files	Number of Annotation Data files	Number of Representation Information Files
		3 ⁵	1	0	0
Product Package Structure					
Manifest file (see section 5.1.5.1 for more details)					
File name			Composition		
xfdumanifest.xml					
Measurement Data files (see section 5.1.5 for more details)					N.O.
File name			Composition		
MeasurementData.nc			Brightness_temp and Antenna_temp for each channel		
Annotation Data files					N.O.
File name			Composition		
none					
Representation Information Files					N.O.
File name			Composition		
none					

Table 5-26: MWR Level 1 product physical composition

5.1.5.2 Manifest File

The structure of the Manifest element is described in [AD- 2].

5.1.5.3 Product Metadata

According to [AD- 2], Wrapped Metadata are grouped in Primary Metadata, common to all Sentinel 3 products and Secondary Metadata, specific for instrument and processing level.

Primary Metadata are described in [AD- 2].

< Complete secondary metadata is described in details in [AD- 4].
The content of this table will be embedded in the document when it will be finalized>

Table 5-27: Secondary Metadata for MW_1_MWR___ products

⁵ Number of Package components includes the manifest and the OLQC Report.

5.1.5.4 L1 Measurement Data Files

The content of the Level 1 MWR product is described in the table below:

Element name	Description	Range or value	T	D
time_mwr_l1b	Number of MWR L1B observation measurements			
mwr_chan	Number of channels	2		
<Specific global attributes>	:Conventions = netCDF convention :mission_name = Name of the mission :radiometer_sensor_name = Name of the radiometer sensor :acq_station_name = Identification of the acquisition station :first_meas_time = UTC Date of the first measurement of the data set (YYYY-MM-DD HH:MM:SS.mmmmmm) :last_meas_time = UTC Date of the last measurement of the data set (YYYY-MM-DD HH:MM:SS.mmmmmm) :xref_radiometer_level0 = Name of the radiometer level 0 data file :xref_radiometer_orbit = Name of the file containing the Orbit Data :xref_radiometer_ltm_nir_cal = Name of the LTM file containing the NIR mode calibration parameters :xref_radiometer_ltm_dnb_cal = Name of the LTM file containing the DNB mode calibration parameters: :xref_radiometer_sat_temp = Name of the file containing the satellite temperature along the orbit :xref_radiometer_characterisation = Name of the radiometer characterisation data file	S		
mwr_chan	number of MWR channels		sc	mwr_chan
units	Unit name	count		1
comment	Set to be compliant with the CF-1.6 convention			1
time_mwr_l1b	UTC : mwr_l1b mode		D	time_mwr_l1b
standard_name	Name of the physical quantity following the NetCDF Climate and Forecast (CF) Metadata Conventions	time		1
units	Unit name	seconds since 2000-01-01 00:00:00.0		1
calendar		gregorian		1
UTC_day_mwr_l1b	day UTC : mwr_l1b mode		ss	time_mwr_l1b
units	Unit name	days since 2000-01-01 00:00:00.0		1
_FillValue	Default value for unused or not computed elements	32762s		1

UTC_sec_mwr_l1b	seconds in the day UTC : mwr_l1b mode		D	time_mwr_l1b
units	Unit name	s		1
_FillValue	Default value for unused or not computed elements	1.84467440737096e+19		1
GPS_time_mwr_l1b	GPS time : mwr_l1b mode		D	time_mwr_l1b
units	Unit name	seconds since 1980-01-06 00:00:00.0		1
calendar		gregorian		1
_FillValue	Default value for unused or not computed elements	1.84467440737096e+19		1
isp_coarse_time_mwr_l1b	ISP coarse time: mwr_l1b mode		sl	time_mwr_l1b
units	Unit name	second		1
isp_fine_time_mwr_l1b	ISP fine time: mwr_l1b mode		sl	time_mwr_l1b
units	Unit name	2 [^] -24 second		1
_FillValue	Default value for unused or not computed elements	2147483647		1
lat_mwr_l1b	latitude : mwr_l1b mode		sl	time_mwr_l1b mwr_chan
standard_name	Name of the physical quantity following the NetCDF Climate and Forecast (CF) Metadata Conventions	latitude		1
units	Unit name	degrees_north		1
scale_factor	The data must be multiplied by this factor after reading	1.e-06		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
_FillValue	Default value for unused or not computed elements	2147483647		1
lon_mwr_l1b	longitude : mwr_l1b mode		sl	time_mwr_l1b mwr_chan
standard_name	Name of the physical quantity following the NetCDF Climate and Forecast (CF) Metadata Conventions	longitude		1
units	Unit name	degrees_east		1
scale_factor	The data must be multiplied by this factor after reading	1.e-06		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
_FillValue	Default value for unused or not computed elements	2147483647		1
yaw_mwr_l1b	yaw angle		D	time_mwr_l1b
units	Unit name	degrees		1
_FillValue	Default value for unused or not computed elements	2147483647.		1
pitch_mwr_l1b	pitch angle		D	time_mwr_l1b
units	Unit name	degrees		1
_FillValue	Default value for unused or not computed elements	2147483647.		1

roll_mwr_l1b	roll angle		D	time_mwr_l1b
units	Unit name	degrees		1
_FillValue	Default value for unused or not computed elements	2147483647.		1
noise_pulse_mwr_l1b	Noise pulse length for both channels		sl	time_mwr_l1b mwr_chan
_FillValue	Default value for unused or not computed elements	2147483647		1
units	Unit name	/		1
scale_factor	The data must be multiplied by this factor after reading	0.0001		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
error_voltage_mwr_l1b_mode_obs	Error voltage in mode in mode obs for mwr_l1b		sl	time_mwr_l1b mwr_chan
_FillValue	Default value for unused or not computed elements	2147483647		1
units	Unit name	V		1
scale_factor	The data must be multiplied by this factor after reading	0.0001		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
comment	Value from calibration used to retrieve the antenna temperature			1
phys_temp_refl_mwr_l1b	Physical temperature of the reflector		sl	time_mwr_l1b
_FillValue	Default value for unused or not computed elements	2147483647		1
units	Unit name	K		1
scale_factor	The data must be multiplied by this factor after reading	0.0001		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
phys_temp_skyhorn_mwr_l1b	Physical temperature of the sky horn		sl	time_mwr_l1b
_FillValue	Default value for unused or not computed elements	2147483647		1
units	Unit name	K		1
scale_factor	The data must be multiplied by this factor after reading	0.0001		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
phys_temp_feeder_mwr_l1b	Physical temperature of the feeders		sl	time_mwr_l1b mwr_chan
_FillValue	Default value for unused or not computed elements	2147483647		1
units	Unit name	K		1
scale_factor	The data must be multiplied by this factor after reading	0.0001		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1

phys_temp_calwg_mwr_l1b	Physical temperature of the calibration wave guides		sl	time_mwr_l1b mwr_chan
_FillValue	Default value for unused or not computed elements	2147483647		1
units	Unit name	K		1
scale_factor	The data must be multiplied by this factor after reading	0.0001		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
phys_temp_ns_mwr_l1b	Physical temperature of the noise sources		sl	time_mwr_l1b mwr_chan
_FillValue	Default value for unused or not computed elements	2147483647		1
units	Unit name	K		1
scale_factor	The data must be multiplied by this factor after reading	0.0001		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
phys_temp_dl_mwr_l1b	Physical temperature of the Dicke Loads		sl	time_mwr_l1b mwr_chan
_FillValue	Default value for unused or not computed elements	2147483647		1
units	Unit name	K		1
scale_factor	The data must be multiplied by this factor after reading	0.0001		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
phys_temp_switch_mwr_l1b	Physical temperature of the switch assemblies		sl	time_mwr_l1b mwr_chan
_FillValue	Default value for unused or not computed elements	2147483647		1
units	Unit name	K		1
scale_factor	The data must be multiplied by this factor after reading	0.0001		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
adc_gain_mwr_l1b	ADC gain		sl	time_mwr_l1b
_FillValue	Default value for unused or not computed elements	2147483647		1
adc_offset_mwr_l1b	ADC offset		sl	time_mwr_l1b
_FillValue	Default value for unused or not computed elements	2147483647		1
nir_noise_inj_temp_mwr_l1b	Averaged noise injection temperature		sl	time_mwr_l1b mwr_chan
_FillValue	Default value for unused or not computed elements	2147483647		1
units	Unit name	K		1
scale_factor	The data must be multiplied by this factor after reading	0.0001		1

add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
nir_ns_phys_temp_mwr_l1b	Averaged noise source physical temperature		sl	time_mwr_l1b mwr_chan
_FillValue	Default value for unused or not computed elements	2147483647		1
units	Unit name	K		1
scale_factor	The data must be multiplied by this factor after reading	0.0001		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
receiver_gain_mwr_l1b	Receiver gain		sl	time_mwr_l1b mwr_chan
_FillValue	Default value for unused or not computed elements	2147483647		1
units	Unit name	mV/K		1
scale_factor	The data must be multiplied by this factor after reading	0.0001		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
antenna_temp_mwr_l1b	Antenna Temperature		sl	time_mwr_l1b mwr_chan
_FillValue	Default value for unused or not computed elements	2147483647		1
units	Unit name	K		1
scale_factor	The data must be multiplied by this factor after reading	0.0001		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
brightness_temp_mwr_l1b	Brightness Temperature		sl	time_mwr_l1b mwr_chan
_FillValue	Default value for unused or not computed elements	2147483647		1
units	Unit name	K		1
scale_factor	The data must be multiplied by this factor after reading	0.0001		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
time_delay_NIR_mwr_l1b	time delay between observation and NIR cal		D	time_mwr_l1b
units	Unit name	second		1
calendar		gregorian		1
time_delay_DNB_mwr_l1b	time delay between observation and DNB cal		D	time_mwr_l1b
units	Unit name	second		1
calendar		gregorian		1
tb_thr_quality_flag	Quality flag of brightness temperature based on thresholds		sc	time_mwr_l1b mwr_chan
_FillValue	Default value for unused or not computed elements	127b		1

flag_values	Flag values	0b, 1b		1
flag_meanings	Flag meanings	good bad		1
tb_cal_quality_flag	Quality flag of brightness temperature based on calibration		sc	time_mwr_l1b mwr_chan
_FillValue	Default value for unused or not computed elements	127b		1
flag_values	Flag values	0b, 1b, 2b		1
flag_meanings	Flag meanings	nominal limits out of limits		1

Table 5-28: Content of the Level 1 measurement data file (MW_1_MWR product)

5.1.6 MWR “MW_1_CAL___”

A Level 1 Calibration MWR product contains one "calibration data file" containing the L1b calibration parameters for the calibration.

5.1.6.1 Product summary

Product Package Type MW_1_CAL___		Description MWR Level 1 calibration and monitoring data			
Product Level	Diss. Timeliness	Product Category	Application Domain		Spatial Resolution
1	NRT/STC/NTC	Not Available to the user	LAN WAT		
Product Dissemination Unit N/A		Number of Package Components	Number of Measurement Data Files	Number of Annotation Data files	Number of Representation Information Files
		3 ⁶	1	0	0
Product Package Structure					
Manifest file (see section 0 for more details)					
File name			Composition		
xfdumainfest.xml					
Measurement Data files (see section 5.1.5 for more details)					N.O.
File name			Composition		
MonCalData.nc			Calibration information		
Annotation Data files					N.O.
File name			Composition		
none					
Representation Information Files					N.O.
File name			Composition		
none					

Table 5-30: MWR Calibration Level 1 product physical composition

5.1.6.2 Manifest File

The structure of the Manifest element is described in [AD- 2].

5.1.6.3 Product Metadata

According to [AD- 2], Wrapped Metadata are grouped in Primary Metadata, common to all Sentinel 3 products and Secondary Metadata, specific for instrument and processing level.

Primary Metadata are described in [AD- 2].

< Complete secondary metadata is described in details in [AD- 4].
The content of this table will be embedded in the document when it will be finalized>

Table 5-31: Secondary Metadata for MW_1_CAL___ products

⁶ Number of Package components includes the manifest and the OLQC Report.

5.1.6.4 L1 Measurement Data Files

The content of the Level 1 Calibration MWR product is described in the table below:

Element name	Description	Range or value	T	D
time_cal_nir_mwr_l1b	Number of MWR L1B NIR calibration measurements			
time_cal_dnb_mwr_l1b	Number of MWR L1B DNB calibration measurements			
time_mon_mwr_l1b	Number of MWR L1B monitoring measurements			
mwr_chan	Number of channels	2		
<Specific global attributes>	:Conventions = netCDF convention :mission_name = Name of the mission :radiometer_sensor_name = Name of the radiometer sensor :acq_station_name = Identification of the acquisition station :first_meas_time = UTC Date of the first measurement of the data set (YYYY-MM-DD HH:MM:SS.mmmmmm) :last_meas_time = UTC Date of the last measurement of the data set (YYYY-MM-DD HH:MM:SS.mmmmmm) :xref_radiometer_level0 = Name of the radiometer level 0 data file :xref_radiometer_orbit = Name of the file containing the Orbit Data :xref_radiometer_ltm_nir_cal = Name of the LTM file containing the NIR mode calibration parameters :xref_radiometer_ltm_dnb_cal = Name of the LTM file containing the DNB mode calibration parameters :xref_radiometer_sat_temp = Name of the file containing the satellite temperature along the orbit :xref_radiometer_characterisation = Name of the radiometer characterisation data file			
mwr_chan	number of MWR channels		sc	mwr_chan
units	Unit name	count		1
comment	Set to be compliant with the CF-1.6 convention			1
time_cal_nir_mwr_l1b	UTC : cal_nir_mwr_l1b mode		D	time_cal_nir_mwr_l1b
standard_name	Name of the physical quantity following the NetCDF Climate and Forecast (CF) Metadata Conventions	time		1
units	Unit name	seconds since 2000-01-01 00:00:00.0		1
calendar		gregorian		1

time_cal_dnb_mwr_l1b	UTC : cal_dnb_mwr_l1b mode		D	time_cal_dnb_mwr_l1b
standard_name	Name of the physical quantity following the NetCDF Climate and Forecast (CF) Metadata Conventions	time		1
units	Unit name	seconds since 2000-01-01 00:00:00.0		1
calendar		gregorian		1
time_mon_mwr_l1b	UTC : mon_mwr_l1b mode		D	time_mon_mwr_l1b
standard_name	Name of the physical quantity following the NetCDF Climate and Forecast (CF) Metadata Conventions	time		1
units	Unit name	seconds since 2000-01-01 00:00:00.0		1
calendar		gregorian		1
UTC_day_cal_nir_mwr_l1b	day UTC : cal_nir_mwr_l1b mode		ss	time_cal_nir_mwr_l1b
units	Unit name	days since 2000-01-01 00:00:00.0		1
_FillValue	Default value for unused or not computed elements	32762s		1
UTC_day_cal_dnb_mwr_l1b	day UTC : cal_dnb_mwr_l1b mode		ss	time_cal_dnb_mwr_l1b
units	Unit name	days since 2000-01-01 00:00:00.0		1
_FillValue	Default value for unused or not computed elements	32762s		1
UTC_day_mon_mwr_l1b	day UTC : cal_mon_l1b mode		ss	time_cal_nir_mwr_l1b
units	Unit name	days since 2000-01-01 00:00:00.0		1
_FillValue	Default value for unused or not computed elements	32762s		1
UTC_sec_cal_nir_mwr_l1b	seconds in the day UTC : cal_nir_mwr_l1b mode		D	time_cal_nir_mwr_l1b
units	Unit name	s		1
_FillValue	Default value for unused or not computed elements	1.84467440737096e+19		1
UTC_sec_cal_dnb_mwr_l1b	seconds in the day UTC : cal_dnb_mwr_l1b mode		D	time_cal_dnb_mwr_l1b
units	Unit name	s		1
_FillValue	Default value for unused or not computed elements	1.84467440737096e+19		1
UTC_sec_mon_mwr_l1b	seconds in the day UTC : cal_mon_l1b mode		D	time_mon_mwr_l1b
units	Unit name	s		1
_FillValue	Default value for unused or not computed elements	1.84467440737096e+19		1
GPS_time_cal_nir_mwr_l1b	GPS time : cal_nir_mwr_l1b mode		D	time_cal_nir_mwr_l1b
units	Unit name	seconds since 1980-01-06 00:00:00.0		1
calendar		gregorian		1
_FillValue	Default value for unused or not computed elements	1.84467440737096e+19		1
GPS_time_cal_dnb_mwr_l1b	GPS time : cal_dnb_mwr_l1b mode		D	time_cal_dnb_mwr_l1b

units	Unit name	seconds since 1980-01-06 00:00:00.0		1
calendar		gregorian		1
_FillValue	Default value for unused or not computed elements	1.84467440737096e+19		1
GPS_time_mon_mwr_l1b	GPS time : mon_mwr_l1b mode		D	time_mon_mwr_l1b
units	Unit name	seconds since 1980-01-06 00:00:00.0		1
calendar		gregorian		1
_FillValue	Default value for unused or not computed elements	1.84467440737096e+19		1
lat_cal_nir_mwr_l1b	latitude : cal_nir_mwr_l1b mode		sl	time_cal_nir_mwr_l1b mwr_chan
standard_name	Name of the physical quantity following the NetCDF Climate and Forecast (CF) Metadata Conventions	latitude		1
units	Unit name	degrees_north		1
scale_factor	The data must be multiplied by this factor after reading	1.e-06		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
_FillValue	Default value for unused or not computed elements	2147483647		1
lat_cal_dnb_mwr_l1b	latitude : cal_dnb_mwr_l1b mode		sl	time_cal_dnb_mwr_l1b mwr_chan
standard_name	Name of the physical quantity following the NetCDF Climate and Forecast (CF) Metadata Conventions	latitude		1
units	Unit name	degrees_north		1
scale_factor	The data must be multiplied by this factor after reading	1.e-06		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
_FillValue	Default value for unused or not computed elements	2147483647		1
lat_mon_mwr_l1b	latitude : mon_mwr_l1b mode		sl	time_mon_mwr_l1b mwr_chan
standard_name	Name of the physical quantity following the NetCDF Climate and Forecast (CF) Metadata Conventions	latitude		1
units	Unit name	degrees_north		1
scale_factor	The data must be multiplied by this factor after reading	1.e-06		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
_FillValue	Default value for unused or not computed elements	2147483647		1
lon_cal_nir_mwr_l1b	longitude : cal_nir_mwr_l1b mode		sl	time_cal_nir_mwr_l1b mwr_chan
standard_name	Name of the physical quantity following the NetCDF Climate and Forecast (CF) Metadata Conventions	longitude		1

units	Unit name	degrees_east		1
scale_factor	The data must be multiplied by this factor after reading	1.e-06		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
_FillValue	Default value for unused or not computed elements	2147483647		1
lon_cal_dnb_mwr_l1b	longitude : cal_dnb_mwr_l1b mode		sl	time_cal_dnb_mwr_l1b mwr_chan
standard_name	Name of the physical quantity following the NetCDF Climate and Forecast (CF) Metadata Conventions	longitude		1
units	Unit name	degrees_east		1
scale_factor	The data must be multiplied by this factor after reading	1.e-06		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
_FillValue	Default value for unused or not computed elements	2147483647		1
lon_mon_mwr_l1b	longitude : mon_mwr_l1b mode		sl	time_mon_mwr_l1b mwr_chan
standard_name	Name of the physical quantity following the NetCDF Climate and Forecast (CF) Metadata Conventions	longitude		1
units	Unit name	degrees_east		1
scale_factor	The data must be multiplied by this factor after reading	1.e-06		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
_FillValue	Default value for unused or not computed elements	2147483647		1
nir_noise_inj_temp_mwr_l1b	Averaged noise injection temperature		sl	time_cal_nir_mwr_l1b mwr_chan
_FillValue	Default value for unused or not computed elements	2147483647		1
units	Unit name	K		1
scale_factor	The data must be multiplied by this factor after reading	0.0001		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
nir_ns_phys_temp_mwr_l1b	Averaged noise source physical temperature (NIR Calibration)		sl	time_cal_nir_mwr_l1b mwr_chan
_FillValue	Default value for unused or not computed elements	2147483647		1
units	Unit name	K		1
scale_factor	The data must be multiplied by this factor after reading	0.0001		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
error_voltage_DNB_hot_mwr_l1b	Averaged error voltage in DNB calibration mode (hot point)		sl	time_cal_dnb_mwr_l1b mwr_chan
_FillValue	Default value for unused or not computed elements	2147483647		1

units	Unit name	V		1
scale_factor	The data must be multiplied by this factor after reading	0.0001		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
error_voltage_DNB_cold_mwr_l1b	Averaged error voltage in DNB calibration mode (cold point)		sl	time_cal_dnb_mwr_l1b mwr_chan
_FillValue	Default value for unused or not computed elements	2147483647		1
units	Unit name	V		1
scale_factor	The data must be multiplied by this factor after reading	0.0001		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
receiver_gain_mwr_l1b	Receiver gain		sl	time_cal_dnb_mwr_l1b mwr_chan
_FillValue	Default value for unused or not computed elements	2147483647		1
units	Unit name	mV/K		1
scale_factor	The data must be multiplied by this factor after reading	0.0001		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1
mon_noise_inj_temp_mwr_l1b	noise injection temperature (Monitoring)		sl	time_mon_mwr_l1b mwr_chan
_FillValue	Default value for unused or not computed elements	2147483647		1
units	Unit name	K		1
scale_factor	The data must be multiplied by this factor after reading	0.0001		1
add_offset	This offset must be added to the data after reading (and after scaling if needed)	0.000000e+00		1

Table 5-32: Content of the L1 Measurement Data file (MW_1_CAL product)

5.2 Annotation Data Files

Not applicable to the L1b SRAL-MWR products (see [AD-2]).

6. MANIFEST FILE DESCRIPTION

This section describes the content and the structure of the Manifest file for the Sentinel-3 SRAL/MWR product.

Most of the description are common to all products and are therefore described in [AD-2]. Only the IPF specific parts are detailed in this section.

6.1 InformationPackageMap

6.1.1 SRAL “SR_1_SRA___”, “SR_1_SRA_A_” and “SR_1_SRA_BS”

The Information Package Map associated to the package of the Level 1 products (SR_1_SRA___, SR_1_SRA_A_ and SR_1_SRA_A_) is reported in Table 6-1.

Name				Description	Data Type	Value	O cc
contentUnit				The information package map contains one content unit that includes the product data component included in the product.	Content Unit Type		1
	ID			Identifier of the package	S	“packageUnit”	0..1
	unitType			Describes the type of data referenced by this content unit	S	“Information Package”	0..1
	textInfo			Textual description of the content unit	S	“SENTINEL-3 SRAL Level 1”	0..1
	pdiID			Identifier of the Preservation Description Information applicable to this content unit	S	“processing”	1
	dmdID			Identifier of the MetaData applicable to this content unit	S	In any order : “acquisitionPeriod” “platform” “generalProductInformation” “orbitReference” “processing” “qualityInformation” “frameSet” “sralProductInformation”	1
	contentUnit						1
		ID		Content unit ID	S	MesurementUnit	
		unitType			S	“Measurement Data Unit”	1
		textInfo			S	“Measurement Data Set”	0..1
		dmdID		Attribute: Description MetaData Identifier	S		0..1
		dataObject Pointer					1
			ID	Data Object pointer ID	S		0..1
			dataObje ctID	Data Object element ID	S	“MeasurementData”	1

Table 6-1: InformationPackageMap for SRAL Level 1 products

6.1.2 SRAL "SR_1_CAL"

The Information Package Map associated to the package of the SR_1_CAL product is reported in Table 6-2.

Name				Description	Data Type	Value	Occ
contentUnit				The information package map contains one content unit that includes the product data component included in the product.	Content Unit Type		1
	ID			Identifier of the package	S	"packageUnit"	0..1
	unitType			Describes the type of data referenced by this content unit	S	"Information Package"	0..1
	textInfo			Textual description of the content unit	S	"SENTINEL-3 SRAL Calibration Level 1"	0..1
	pdiID			Identifier of the Preservation Description Information applicable to this content unit	S	"processing"	1
	dmdID			Identifier of the MetaData applicable to this content unit	S	In any order : "acquisitionPeriod" "platform" "generalProductInformation" "orbitReference" "processing" "qualityInformation" "frameSet" "sralProductInformation"	1
	contentUnit						1
		ID		Content unit ID	S	CalibrationUnit	
		unitType			S	"Calibration Data Unit"	1
		textInfo			S	"Calibration Data Set"	0..1
		dmdID		Attribute: Description MetaData Identifier	S		0..1
		dataObject Pointer					1
			ID	Data Object pointer ID	S		0..1
			dataObjectID	Data Object element ID	S	"CalibrationData"	1

Table 6-2: InformationPackageMap for SRAL Calibration Level 1 products

6.1.3 MWR “MW_1_MWR”

The Information Package Map associated to the package of the MW_1_MWR product is reported in Table 6-3.

Name				Description	Data Type	Value	Occ
contentUnit				The information package map contains one content unit that includes the product data component included in the product.	Content Unit Type		1
	ID			Identifier of the package	S	“packageUnit”	0..1
	unitType			Describes the type of data referenced by this content unit	S	“Information Package”	0..1
	textInfo			Textual description of the content unit	S	“SENTINEL-3 MWR Level 1 Measurement Product”	0..1
	pdiID			Identifier of the Preservation Description Information applicable to this content unit	S	“processing”	1
	dmdID			Identifier of the MetaData applicable to this content unit	S	In any order : “acquisitionPeriod” “platform” “generalProductInformation” “orbitReference” “processing” “qualityInformation” “frameSet” “mwrProductInformation”	1
	contentUnit						1
		ID		Content unit ID	S	MeasurementUnit	1
		unitType			S	“Measurement Data Unit”	1
		textInfo			S	“Measurement Data Set”	0..1
		dmdID		Attribute: Description MetaData Identifier	S		0..1
		dataObject Pointer					1
			ID	Data Object pointer ID	S		0..1
			dataObjectID	Data Object element ID	S	“MeasurementData”	1

Table 6-3: InformationPackageMap for MWR Level 1 products

6.1.4 MWR "MW_1_CAL"

The Information Package Map associated to the package of the MW_1_CAL product is reported in Table 6-4.

Name				Description	Data Type	Value	Occ
contentUnit				The information package map contains one content unit that includes the product data component included in the product.	Content Unit Type		1
	ID			Content unit Identifier	S	packageUnit	0..1
	unitType			Describes the type of data referenced by this content unit	S	"Information Package"	0..1
	textInfo			Textual description of the content unit	S	"SENTINEL-3 MWR Level 1 Calibration Product"	0..1
	pdiID			Identifier of the Preservation Description Information applicable to this content unit	S	"processing"	1
	dmdID			Identifier of the MetaData applicable to this content unit	S	In any order : "acquisitionPeriod" "platform" "generalProductInformation" "orbitReference" "processing" "qualityInformation" "frameSet" "mwrProductInformation"	1
	contentUnit						1
		ID		Content unit ID	S	CalibrationUnit	0..1
		unitType			S	"Calibration Data Unit"	1
		textInfo			S	"Calibration Data Set"	0..1
		dmdID		Attribute: Description MetaData Identifier	S		0..1
		dataObject Pointer					1
		ID		Data Object pointer ID	S		0..1
		dataObjectID		Data Object element ID	S	"CalibrationData"	1

Table 6-4: InformationPackageMap for MWR Calibration Level 1 products

6.2 Metadata Section

See [AD- 2] for the metadata general description.

6.3 Data Object Section

6.3.1 SRAL “SR_1_SRA___”, “SR_1_SRA_A_” and “SR_1_SRA_BS”

The dataObjectSection for SRAL Level 1 products is filled as follows:

- “SR_1_SRA___”

Name				Description	Data type	Occ.	Value
Data Object				This element references the Data Component included in the L1 product.	U	1..*	
	ID			Data Component ID	S	1	“MeasurementData”, “AcquisitionData”
	byte Stream			Pointer to the Data Component	U	1..*	
		ID		Byte stream ID	S	0..1	
		mimeType		MIME type for the referenced Data Component	E	1	"application/x-netcdf"
		size		Size of the Data Object File	L	1	
		fileLocation		Description of the location of the data component file	U	1	
			locator Type	Type of the file location	URL	0..1	URL
			href	Relative path of the file (in the file system) containing the referenced Data Component	S		SR_1_SRA___: “measurement.nc” “acquisition.nc”
			textInfo	Textual description of the Data Component	S	0..1	“Measurement Data Object File” “Acquisition Data Object File”
		checksum		Checksum for the Data Component	U	1	
			checksumName		E	1	MD5

Table 6-5: SRAL Level 1 Specialization dataObject Entity

- “SR_1_SRA_A_”, “SR_1_SRA_BS”

Name				Description	Data type	Occ.	Value
Data Object				This element references the Data Component included in the L1 product.	U	1..*	

Name				Description	Data type	Occ.	Value
	ID			Data Component ID	S	1	"MeasurementData"
	byte Stream			Pointer to the Data Component	U	1..*	
		ID		Byte stream ID	S	0..1	
		mimeType		MIME type for the referenced Data Component	E	1	"application/x-netcdf"
		size		Size of the Data Object File	L	1	
		fileLocation		Description of the location of the data component file	U	1	
			locator Type	Type of the file location	URL	0..1	URL
			href	Relative path of the file (in the file system) containing the referenced Data Component	S		SR_1_SRA_A_: "measurement_11a.nc" SR_1_SRA_BS_: "measurement_11bs.nc"
			textInfo	Textual description of the Data Component	S	0..1	"Measurement Data Object File"
		checksum		Checksum for the Data Component	U	1	
			checksumName		E	1	MD5

Table 6-6: SRAL Level 1 Specialization dataObject Entity

6.3.2 SRAL "SR_1_CAL"

The dataObjectSection for SRAL Calibration Level 1 products is filled as follows:

Name				Description	Data type	Occ.	Value
Data Object				This element references the Data Component included in the L1 product.	U	1..*	
	ID			Data Component ID	S	1	"CalibrationData"
	byte Stream			Pointer to the Data Component	U	1..*	
		ID		Byte stream ID	S	0..1	
		mimeType		MIME type for the referenced Data Component	E	1	"application/x-netcdf"
		size		Size of the Data Object File	L	1	
		fileLocation		Description of the location of the data component file	U	1	
			locator Type	Type of the file location	URL	0..1	URL
			href	Relative path of the file (in the file system) containing the referenced Data Component	S		"calibration.nc"
			textInfo	Textual description of the Data Component	S	0..1	"Calibration Data Object File"
		checksum		Checksum for the Data Component	U	1	
			checksumName		E	1	MD5

Table 6-7: SRAL Calibration Level 1 Specialization dataObject Entity

6.3.3 MWR “MW_1_MWR”

The dataObjectSection for MWR Level 1 Measurement products is filled as follows:

Name				Description	Data type	Occ.	Value
Data Object				This element references the Data Component included in the L1 product.	U	1..*	
	ID			Data Component ID	S	1	“MeasurementData”
	byte Stream			Pointer to the Data Component	U	1..*	
		ID		Byte stream ID	S	0..1	
		contentType		MIME type for the referenced Data Component	E	1	"application/x-netcdf"
		size		Size of the Data Object File	L	1	
		fileLocation		Description of the location of the data component file	U	1	
			locator Type	Type of the file location	URL	0..1	URL
			href	Relative path of the file (in the file system) containing the referenced Data Component	S		“MeasurementData.nc”
			textInfo	Textual description of the Data Component	S	0..1	“Measurement Data Object File”
		checksum		Checksum for the Data Component	U	1	
			checksumName		E	1	MD5

Table 6-8: MWR Level 1 Measurement Specialization dataObject Entity

6.3.4 MWR “MW_1_CAL”

The dataObjectSection for MWR Level 1 Calibration products is filled as follows:

Name				Description	Data type	Occ.	Value
Data Object				This element references the Data Component included in the L1 product.	U	1..*	
	ID			Data Component ID	S	1	“CalibrationData”
	byte Stream			Pointer to the Data Component	U	1..*	
		ID		Byte stream ID	S	0..1	
		mimeType		MIME type for the referenced Data Component	E	1	“application/x-netcdf”
		size		Size of the Data Object File	L	1	
		fileLocation		Description of the location of the data component file	U	1	
			locator Type	Type of the file location	URL	0..1	URL
			href	Relative path of the file (in the file system) containing the referenced Data Component	S		“MonCalData.nc”
			textInfo	Textual description of the Data Component	S	0..1	“Calibration Data Object File”
		checksum		Checksum for the Data Component	U	1	
			checksumName		E	1	MD5

Table 6-9: MWR Level 1 Calibration Specialization dataObject Entity

7. XML SCHEMA

The xml schemas used to generate the product manifest are provided as separate files (see AD- 5).

8. PRODUCT SIZE

In the following table the approximate size of each L1b SRAL and MWR product is given under the following hypothesis:

- Each Level 1b Measurement Data File contains one-orbit data. An orbit represents a time span of two consecutive crossings of the Ascending Node (ANX). For S3 it means ≈ 6060 seconds.
- Duty cycles are for scenario MOS 1 described on [AD- 7]. This scenario assumes that the complete sensing data of the satellite is received and processed.
 - For the SRAL instrument, it was previously assumed in this scenario that the altimeter measurements will be performed in LRM mode for 25% of time and SAR mode for 75% of time. However, based on the recent hypothesis of a 100% SAR activation, in the following table the mode repartition with a 100% SAR mode is provided. The activation of the PLRM processing is considered enabled when the instrument is in SAR mode. We also provide the figures for a 100% LRM scenario.
 - For the MWR instrument, it is assumed that we dispose of 100% measurements.
- No NetCDF compression is applied.
- The figures provided in the next table are based on a theoretical size computation, considering for each product type the list of parameters and their type (hence storage size). It does not take into account any size variation related to the NetCDF storage method

Product type	Size of an individual measurement	Size (MB/Orbit)	Duty cycle
SR_1_SRA_	<u>One second of data</u> (i.e. 1 second of 20-Hz elementary measurements): 24 KB (LRM) 49 KB (SAR)	70 MB 290 MB	<u>Mode repartition:</u> LRM 100% => 70 MB SAR 100 % => 290 MB
SR_1_SRA_A_	:	17.5 GB	SAR 100 % => 9.5 GB
SR_1_SRA_BS	:	18.1 GB	SAR 100 % => 18.1 GB
SR_1_CAL	<u>For one calibration (all CAL elements):</u> 700 KB	N/A	N/A
MW_1_MWR	<u>One 6.66-Hz measurement:</u> 204 bytes	7.6 MB	100% => 7.6 MB

Product type	Size of an individual measurement	Size (MB/Orbit)	Duty cycle
MW_1_CAL	<u>For one calibration sequence:</u> NIR 58 bytes DNB 66 bytes <u>For one monitoring sequence</u> 50 bytes	<1 MB	100% => <1 MB

Table 8-1: Size of the SRAL/MWR products

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