SALP

SALP Products Specification – Volume 30 : Jason-3 User Products

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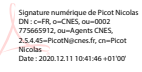
Approved by :	N. PICOT	CNES	
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For	DS2	DS4	DS5	DH2	TP	ENVISAT	JASON1	DCY	LTA-SIRAL
Application to									
For	SMM	SALP				JASON2	JASON3		SARAL/AltiKa
Application to							X		

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SUMMARY

Confidentiality : no Type :
Key words : Jason-3 User Products
Summary : This document is aimed at defining the Jason-3 User Products

DOCUMENT CHANGE RECORD

Issue	Update	Date	Modifications	Visa
1	**0**	**6-oct-11**	**Creation** (SALP evolution SALP-FT-8044)	
1	**1**	**6-july-12**	Modification of the diffusion list at the end of the document. Typos corrections. Jason-3 evolutions to reach GDR-D standard and modifications w.r.t. Jason-2 (SALP-FT-8377 and SALP-FT-8477): • Modification of the format of the atmospheric attenuation parameter ("short integer" instead of "byte" for parameter : atmos_corr_sig0_ku and atmos_corr_sig0_c) • Quality flag = “orb_state_flag_rest” replaced by Quality flag = “orb_state_flag_rest or orb_state_flag_diode” + comments • Microseconds (".mmmmmm") removed from the global attribute « history » • Modification of the “tracker_diode_20hz:long_name” (‘counter’ removed from the field) • Modification of calibration bias values in the comment of the parameters ‘wind_speed_alt’ and ‘wind_speed_alt_mle3’ Modification of global attributes: • Contact e-mail for NOAA • Reference document • DORIS sensor name (“DGXX-S” instead of “DGXX”)	**E. BRONNER**
1	**2**	**9-dec-2013**	Modification of the ecmwf_meteo_map_avail flag meaning and comment (SALP-FT-8904).	**E. BRONNER**

1	**3**	**10-Mar-2014**	Modification of the content of the LTM file reference in the header to take into account CAL1 modification (SALP-FT-8885) Modification of the AVISO helpdesk reference in the global attributes of the products	**E. BRONNER**
1	**4**	**1-Jul-2016**	• Modification of calibration bias values in the comment of the parameters 'wind_speed_alt', 'wind_speed_alt_mle3' and 'rain_flag'. Modification of the comment of the parameters 'ssha' and 'ssha_mle3' (SALP-FT-10453rev2).	**E. BRONNER**
1	**5**	**16 January 2017**	• Change request SALP-FT-10764 Modification of GDR latency after OSTST 2016 recommendation. Latency extended from 60 to 90 days in order to allow cold sky calibration processing and use in radiometer calibrations.	
1	**6**	**1-Aug-2019**	SALP-FT-11025 : Strutural evolution of BibiAlti & SPA SALP-FT-10176: Add reference to Gaussian Grids in xref_meteorological_files	**S. URIEN** **F. BIGNALET-CAZALET**

2	**0**	**21-Sept-2020**	SALP-FT-10789 : GDR-F standard mother change request SALP-FT-11268: GDR-F standard batch 1 SALP-FT-11905 : GDR-F standard batch 2 (add meteo at measurement altitude and sea ice concentration fields) SALP-FT-12055 : GDR-F standard : adaptive retracking SALP-FT-12056 : GDR-F standard : waveform classification SALP-FT-12063 : GDR-F standard : batch 3 (surface slope correction, angle of approach to coast, internal tide in SSHA, AMR_TB_QUAL) SALP-FT-12080 : GDR-F standard batch 4 (groups and variable names) SALP-FT-12160 : GDR-F standard : batch 5 SALP-FT-12237 : GDR-F New Geoid SALP-FT-11320 12320 : GDR-F standard : batch 6 SALP-FT-12435 : GDR-F standard : batch 7 (CalVal feedbacks)	**S. URIEN** **F. BIGNALET-CAZALET**
2	**1**	**21-Oct-2020**	Correction on Ed2Rev0 Change Record for FT batch 6 SALP-FT-12566 : GDR-F : processing Baseline 1.01 : -Align calibration bias value used in wind_speed wrt the product (mle4 & adaptive) -correction of attribute "coordinates" de wave_model_interp_qual -correction of sig0_cor_adaptive_net_instr scale_factor	**S. URIEN** **F. BIGNALET-CAZALET**

ABBREVIATIONS

Sigle	Definition
AD	Applicable Documents
AGC	Automatic Gain Control
AMR	Advanced Microwave Radiometer
CAL	Calibration
CDL	Common Data Language
CF-1.0	Climate and Forecast convention
CLS	Collecte Localisation Satellites
CNES	Centre National d'Etudes Spatiales
COG	Center Of Gravity
DAD	Dynamic Auxiliary Data
DORIS	Doppler Orbitography and Radiopositioning Integrated by Satellite
ECMWF	European Centre for Medium-Range Weather Forecasts
FFT	Fast Fourier Transform
GDR	Geophysical Data Record
GPS	Global Positioning System
IGDR	Interim Geophysical Data Record
LPF	Low Pass Filter
LTM	Long Term Monitoring
MDS	Measurement Data Set
N/A	Not Applicable
NRT	Near Real Time
OFL	Off Line
OGDR	Operational Geophysical Data Record
POD	Precise Orbit Determination
POE	Precise Orbit Ephemeris
POSEIDON-3B	Jason-3 altimeter
PTR	Point Target Response
RD	Reference Documents
RMS	Root Mean Square
SAD	Static Auxiliary Data
SALP	Service d'Altimétrie et Localisation Précise
SDR	Sensor Data Record
SGDR	Sensor Geophysical Data Record
SNR	Signal to Noise Ratio
SSALTO	Segment Sol ALTimétrie et Orbitographie
SSHA	Sea-Surface Height Anomaly
SWH	Significant WaveHeight
TBC	To Be Confirmed
TBD	To Be Defined
TEC	Total Electron Content
USO	Ultra Stable Oscillator
UTC	Universal Time Coordinate

APPLICABLE AND REFERENCE DOCUMENTS

Reference	Document title
TP4-J0-STB-32-CNES	AD 1 Jason-3 Operational Service Specification
SMM-DD-BA-EA-23697-CN	AD 2 Bibli_Alti : Jason-3 Interfaces
SMM-ST-BA-EA-23698-CN	AD 3 Bibli_Alti : Jason-3 Processing Steps
SALP-MU-M-OP-16118-CN	RD 1 Jason-3 Products Handbook

TBC AND TBD LIST

TBC/TBD	Paragraph	Brief description

CONTENTS

1. INTRODUCTION

The aim of this document is to define the Jason-3 level2 altimeter products specifications. It is applicable to the development of the processing module (SPA, TM_NRT) and of the other tools developed by 4 partners (BUFR convertor, NRTAVS, …). The document RD 1 (Jason-3 Products Handbook) gives the required information to users.

This document has been named according to the Jason-2 mission (SSALTO Products Specifications – Volume 10 : Jason-2 User Products : SALP-ST-M-EA-15074-CN). Other products specification documents are available to describe experts products and orbitography products. Those additional documents are maintain by CNES SALP project and are names :

- SALP-ST-M-EA-10882-CN : SSALTO Products Specifications – Volume 4 : Positioning and orbitography external products
- SALP-ST-M-EA-10883-CN : Spécifications des produits SSALTO – Volume 5 : Altimeter expertise products
- SALP-ST-M-EA-10884-CN : SSALTO Products Specifications – Volume 6 : Mission orbitography and positioning expertise products
- SALP-ST-M-EA-10885-CN : Spécifications des produits SSALTO – Volume 7 : Produits d'expertise – Réseau de balises

According to requirements from AD 1, three different data products shall be produced and distributed to the users:

1. Operational Geophysical Data Record (**OGDR**) produced in near real time
2. Interim Geophysical Data Record (**IGDR**) produced in 1 to 1.5 days
3. Geophysical Data Record (**GDR**) produced in 90 days

The first one is a NRT product. The other two are OFL products.

In addition to the native NetCdf format which are described in this document, a 1Hz BUFR-formatted dataset from the OGDR family (OGDR-BUFR) for distribution via the World Meteorological Organization (WMO) Global Tele-communication System (GTS) and EUMETCast is also generated. The BUFR format is described in RD 1.

Netcdf OGDR/IGDR/GDR products have the same information and format. The only difference is related to auxiliary data (orbit, meteo files, calibrations, …).

Taken into account Jason-2 heritage, products are splitted into several data sets :

1. One file close to current Jason-2 NRT-**SSHA,** limited to 1Hz sampling.
2. One file close to current Jason-2 I/**GDR**, containing 1Hz and 20Hz values.
3. One file close to current Jason-2 **SGDR**, containing 1Hz, 20Hz and waveforms values. This file is not generated in NRT.

The following table shows the data sets available for each kind of product.

		Data set		
		SSHA	GDR	SGDR
Products	OGDR	X	X	
	IGDR	X	X	X
	GDR	X	X	X

Table 1 – Data set availability per product

An overview of the file format used for the data sets is given in section 2. Then the data sets are described from section 3 to section 8.

2. JASON-3 PRODUCTS OVERVIEW

2.1. NETCDF FORMAT AND CF CONVENTION

The netCDF data format has been chosen to store the different data sets (one file per data set). This format is extremely flexible, self describing and has been adopted as a de-facto standard for many operational oceanography systems. What's more, the files will follow the Climate and Forecast NetCDF conventions CF-1.7 because these conventions provide a practical standard for storing.

2.2. THE NETCDF DATA MODEL

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.

2.2.1. DIMENSIONS

A dimension may be used to represent a real physical dimension, for example, time, latitude, longitude, or height. A dimension might also be used to index other quantities (waveforms index for example). The following dimensions are used in the Jason-3 product files:

			Data set		
Group	**Dimension name**	**Value**	**SSHA**	**GDR**	**SGDR**
data_01	**time**	Number of measurements in the file	Yes	Yes	Yes
data_20	**time**	Number of measurements in the file	No	Yes	Yes
/	**samples**	**104** (number of waveform samples)	No	No	Yes

Table 2 - Dimensions used in the Jason-3 data sets

2.2.2. VARIABLES

Variables are used to store the bulk of the data in a netCDF file. A variable represents an array of values of the same type. A scalar value is treated as a 0-dimensional array. A variable has a name, a data type, and a shape described by its list of dimensions specified when the variable is created. A variable may also have associated attributes, which may be added, deleted or changed after the variable is created.

A variable data type is one of a small set of netCDF types. In this document the variable types will be represented as follows:

Variable type	Description
char	characters
byte	8-bit data signed
short	16-bit signed integer
int	32-bit signed integer
float	IEEE single precision floating point (32 bits)
double	IEEE double precision floating point (64 bits)

Table 3 - netCDF variable type

2.2.3. COORDINATE VARIABLES AND AUXILIARY COORDINATE VARIABLES

A variable with the same name as a dimension is called a coordinate variable. It typically defines a physical coordinate corresponding to that dimension. In accordance with the Climate and Forecast conventions, we must declare a coordinate variable for each dimension. What's more, missing values are not allowed in coordinate variables and they must be strictly monotonic.

An **auxiliary coordinate variable** is a netCDF variable that contains coordinates data but is not a coordinate variable as defined above. Unlike coordinate variables, there is no relationship between the name of an auxiliary coordinate variable and the name(s) of its dimension(s).

2.2.4. ATTRIBUTES

NetCDF attributes are used to store data about the data (ancillary data or metadata), similar in many ways to the information stored in data dictionaries and schema in conventional database systems. Most attributes provide information about a specific variable. These are identified by the name of that variable, together with the name of the attribute.

Some attributes provide information about the data set as a whole. They are called **global attributes** (similar to the header of the Jason-1 products).

The following table shows the variable attributes used in the Jason-3 product. There are no mandatory attributes.

Attribute	Description
_FillValue	A value used to represent missing or undefined data
add_offset	If present, this number is to be added to the date after it is read by an application. If both *scale_factor* and *add_offset* attributes are present, the date are first scaled before the offset is added.
calendar	Reference time calendar
comment	Miscellaneous information about the data or the methods used to produce it
coordinates	Identified auxiliary coordinates variables.
flag_meanings	Use in conjunction with *flag_values* to provide descriptive words or phrase for each

Attribute	Description
	flag value.
flag_values	Provide a list of the flag values. Use in conjunction with *flag_meanings*.
institution	Institution which provides the data
leap_second	UTC time at which a leap second occurs
long_name	A descriptive name that indicates a variable's content. This name is not standardized.
quality_flag	Name of the variable(s) (quality flag) representing the quality of the current variable
scale_factor	If present, the date are to be multiplied by this factor after the data are read by an application. See also *add_offset* attribute.
source	Data source (model features, or observation)
standard_name	A standard name that references a description of a variables content in the standard name table.
tai_utc_difference	Difference between TAI and UTC reference time
units	Unit of a variable's content. The value of this attribute must be a string that can be recognized by the UNIDATA's Udunits package.
valid_max	Largest theoretical valid value of a variable (this is not the maximum of actual data).
valid_min	Smallest theoretical valid value of a variable (this is not the minimum of actual data).

Table 4 - Variable's attributes

2.3. THE COMMON DATA LANGUAGE

The Common Data Language (CDL) will be used to describe the content of a data set.

The CDL is textual notation that described the netCDF object and it is human readable. The netCDF utility **ncdump** converts netCDF objects binary to CDL text. The netCDF utility **ncgen** creates netCDF binary file from CDL text file.

A CDL description of a netCDF data set takes the form:

```
netCDF name {
      dimension: …
      variables: …
      data: …
}
```

where the name is used only as a default in constructing file names by the ncgen utility. The CDL description consists of three optional parts, introduced by the keywords dimensions variables and data. NetCDF dimension declarations appear after the dimensions keyword, netCDF variables and attributes are defined after the variables keyword and variable data assignments appears after the data keyword. CDL statement are terminated by a semicolon. Spaces, tabs and newlines can be used freely for readability. Comments in CDL follow the characters '//' on any line.

Example :

```
netcdf example {
  dimensions:                                                    //  dimensions name are declared first
    time = 2680;

  variables:
    double time(time);                                           // variable <type> <name>(<dimension>)
       time:long_name = "time in UTC";
       time:standard_name = “time”;
       time:calendar = “gregorian”;
       time:tai_utc_difference = < Value of TAI-UTC at time of first record >;
       time:leap_second = < UTC time of the leap second (YYYY-MM-DD hh:mm:ss) >;
       time: units = “seconds since 2000-01-01 00:00:00.0”;
       time: comment = ”Time of measurement in seconds in the UTC time scale since 1 Jan 2000
00:00:00 UTC. [tai_utc_difference] is the difference between TAI and UTC reference time (seconds)
for the first measurement of the data set. If a leap second occurs within the data set, the
attribute [leap_second] is set to the UTC time at which the leap second occurs.”;

    double time_tai(time);
       time_tai:_FillValue = 18446744073709551616.000000
       time_tai:long_name = "time in TAI";
       time_tai:standard_name = “time”;
       time_tai:calendar = “gregorian”;
       time_tai: units = “seconds since 2000-01-01 00:00:00.0”;
       time_tai: comment = ”Time of measurement in seconds in the TAI time scale since 1 Jan 2000
00:00:00 TAI. This time scale contains no leap seconds. The difference (in seconds) with time in UTC
is given by the attribute [time:tai_utc_difference].”;

    int longitude(time);
        longitude:long_name = "longitude";
        longitude:standard_name = "longitude";
        longitude:units = "degrees_east";
        longitude:scale_factor = 1.0e-06;

byte rad_surface_type_flag(time);
       rad_surface_type_flag:_FillValue = 127b;
       rad_surface_type_flag:long_name = "radiometer surface type";
       rad_surface_type_flag:flag_meanings = "open_ocean near_coast land";
       rad_surface_type_flag:flag_values = 0b, 1b, 2b;
       rad_surface_type_flag:coordinates = "longitude latitude";
       rad_surface_type_flag:comment = "Named rad_surf_type in GDR-D standard. The radiometer
surface type flag is applicable to the radiometer wet troposphere path delays provided by
rad_wet_tropo_cor. A value of 0 indicates that open ocean processing is used to compute the path
delay, 1 indicates coastal processing is used, and 2 indicates the path delay is invalid due to
land";

     int altitude(time);
        altitude:long_name = "1 Hz altitude of satellite";
        altitude:_FillValue = 2147483647;
        altitude:units = "m";
        altitude:add_offset = 1.30e+06;
        altitude:scale_factor = 1.00e-04;
        altitude:coordinates = "longitude latitude";
```

- time is a coordinate variable.
- rad_surface_type_flag is a flag fully described by the flag_meanings and flag_values attributes:

  rad_surface_type_flag = 0 -> open ocean surface
  rad_surface_type_flag = 1 -> near coast surface
  rad_surface_type_flag = 2 -> land surface

  If rad_surface_type_flag is not computed, it will take the value 127 (_FillValue attribute).
- altitude is *packed*. The data are stored in 32-bit integers (long). The value of the altitude of the satellite can be recovered using:

altitude = ($altitude_{long}$ * scale_factor) + add_offset

2.4. NAMING CONVENTION

Both MLE-3 and MLE-4 parameters are made available to all users of nominal and reduced datasets, as well as those using expert products. This leads to the following convention on the variables' names described in sections 4 to 8:

Altimeter parameters (e.g. Range, swh, sigma0, etc) and related geophysical parameters (e.g. Ionosphere correction, sea state bias correction, wind speed, etc) named without the "mle3" or "adaptive" extension are derived from MLE-4 retracking, while those with the "mle3" extension are derived from MLE-3 retracking and the those with the "adaptive" extension from Adaptive retracking.

Most users are advised to use the MLE-4 altimeter parameters for typical scientific applications. The MLE-3 Ku band parameters are provided for the convenience of specialized studies on the calibration and validation of the mission and impact of altimeter retracking.

2.5. FILE FORMAT

Jason-3 Altimeter Level 2 Product are NetCdF4/HDF5 files.

A NetCDF native compression is applied: nc_def_var_deflate

using :

- Shuffle = 0 (False)

- Deflate = 1 (True)

- deflate_level = 6

3. GLOBAL ATTRIBUTES

Global attributes are defined in the table below.

			Data set		
Attribute name	**Format**	**Description**	**SSHA**	**GDR**	**SGDR**
Conventions	String	netCDF convention followed: **"CF-1.7"**	X	X	X
title	String	The descriptive title for the data set (ex. OGDR - Reduced dataset IGDR - Standard dataset GDR - Expertise dataset)	X	X	X
institution	String	The name of the data producer (ex. CNES EUMETSAT or NOAA)	X	X	X
source	String	The method of production of original data (model vs observational): **"Processing Baseline F v1.01"**	X	X	X
history	String	Product creation date and time **(**YYYY-MM-DD HH:MM:SS : creation**)**	X	X	X
contact	String	A text giving the primary contact for information about the data set "**CNES** aviso@altimetry.fr, EUMETSAT ops@eumetsat.int, NOAA NODC.services@noaa.gov"	X	X	X
references	String	The version of the altimetric library used to produce the data set (ex: L1 library=V3.1p1, L2 library=V3.0p1, Processing Pilot=V3-0p1p2p3)	X	X	X
processing_center	String	Name of the processing center (SALP, EUMPC or ESPC)	X	X	X
reference_document	String	Name of the reference document describing the products **"Jason-3 Products Handbook, SALP-MU-M-OP-16118-CN"**	X	X	X
mission_name	String	Name of the mission **"Jason-3"**	X	X	X
altimeter_sensor_name	String	Name of the altimeter sensor **"Poseidon-3B"**	X	X	X
radiometer_sensor_name	String	Name of the radiometer sensor **"AMR"**	X	X	X

			Data set		
Attribute name	**Format**	**Description**	**SSHA**	**GDR**	**SGDR**
doris_sensor_name	String	Name of the DORIS sensor **"DGXX-S"**	X	X	X
gpsr_sensor_name	String	Name of the GPSR sensor **"GPSP"**	X	X	X
acq_station_name	String	Identification of the acquisition station (CNES for CNES, EUMET-USG for EUMETSAT, NOAACDAS for NOAA)	X	X	X
cycle_number	long	Cycle number	X	X	X
absolute_rev_number	long	Absolute number of revolution	X	X	X
pass_number	long	Pass number in the cycle (relative pass number)	X	X	X
absolute_pass_number	long	Absolute pass number (since the beginning of the mission)	X	X	X
equator_time	String	UTC time of equator crossing (YYYY-MM-DD HH:MM:SS.mmmmmm)	X	X	X
equator_longitude	double	Longitude of equator crossing	X	X	X
first_meas_time	String	UTC Date of the first measurement of the data set (YYYY-MM-DD HH:MM:SS.mmmmmm)	X	X	X
last_meas_time	String	UTC Date of the last measurement of the data set (YYYY-MM-DD HH:MM:SS.mmmmmm)	X	X	X
xref_input_frame	String	Name of the input frame (only for OGDRs products)	X	X	
xref_altimeter_characterisation	String	Name of the altimeter characterisation data file	X	X	X
xref_altimeter_ltm	String	Name of the files containing the Altimeter Long Term Monitoring (PTR and LPF data)	X	X	X
xref_radiometer_temp	String	Name of the file containing the antenna temperature coefficients	X	X	X
xref_doris_uso	String	Name of the file containing the DORIS-derived USO frequency	X	X	X
xref_orbit_data	String	Name of the file containing the orbit ephemeris	X	X	X
xref_pf_data	String	Name of the file containing the platform data (mispointing, distance antenna-COG)	X	X	X
xref_pole_location	String	Name of the file containing the pole location data	X	X	X
xref_orf_data	String	Name of the Orbit Revolution File used to create the pass file	X	X	X
xref_meteorological_files	String	Name of the files containing the meteorological data (including Altitude Gaussian grid)	X	X	X

			Data set		
Attribute name	**Format**	**Description**	**SSHA**	**GDR**	**SGDR**
xref_sst_data	String	Name of the file containing the sea surface temperature data (applicable to GDRs products only)	X	X	X
xref_wave_model_data	String	Name of the file(s) containing the wave model data (not applicable to OGDRs products)	X	X	X
xref_utc_tai_data	String	Name of the TAI/UTC leap second offset file used to manage the leap second	X	X	X
xref_radiometer_calibration	String	Name of the file containing the radiometer level-1 calibration	X	X	X
xref_gim_data	String	Name of the files containing the ionospheric correction	X	X	X
xref_mog2d_data	String	Name of the files containing the MOG2D correction	X	X	X
xref_polar_ice_data	String	Name of the files containing the ocean sea-ice concentration (not applicable to OGDRs products)	X	X	X
ellipsoid_axis	String	Semi-major axis of the reference ellipsoid	X	X	X
ellipsoid_flattening	String	Flattening coeffcient of the reference ellipsoid	X	X	X

4. GDR-F VERSUS GDR-D NAMING MODIFICATION

The name of the variables has been modified between GDR-D and GDR-F standards for sake of improving consistency with Sentinel-6/Jason-CS mission. The correspondence between GDR-D and GDR-F variables names is provided in the table below.

A color legend is used to distinguish the variables which name has been modified from the ones not modified and the reason for the modification.

	Variable name aligned to Jason-CS
	Variable name modified not aligned to Jason-CS
	Variable not in Jason-CS. Variable name has been modified for sake of consistency with the rest of the variables names
	Variable not in Jason-CS. Variable name not modified
	Variable name identical in Jason-3 GDR-D and Jason-CS
	Variable added for GDR-F

Parameter name - GDR-D	Parameter name - GDR-F
time	time
time_tai	time_tai
time_20hz	time
time_tai_20hz	time_tai
meas_ind	index_first_20hz_measurement
	numtotal_20hz_measurement
	index_1hz_measurement
wvf_ind	samples
lat	latitude
lon	longitude
lat_20hz	latitude
lon_20hz	longitude
rad_surf_type	rad_surface_type_flag
rad_distance_to_land	rad_distance_to_land
surface_type	N.A.
N.A	surface_classification_flag
N.A	angle_of_approach_to_coast
N.A	distance_to_coast

alt_quality_flag (set to FillValue)	alt_qual
rad_quality_flag (set to FillValue)	rad_qual
geophysical_quality_flag (set to FillValue)	geo_qual
qual_alt_1hz_range_ku	range_ocean_compression_qual
qual_alt_1hz_range_ku_mle3	range_ocean_mle3_compression_qual
N.A.	range_adaptive_compression_qual
qual_alt_1hz_range_c	range_ocean_compression_qual
qual_alt_1hz_swh_ku	swh_ocean_compression_qual
qual_alt_1hz_swh_ku_mle3	swh_ocean_mle3_compression_qual
N.A.	swh_adaptive_compression_qual
qual_alt_1hz_swh_c	swh_ocean_compression_qual
qual_alt_1hz_sig0_ku	sig0_ocean_compression_qual
qual_alt_1hz_sig0_ku_mle3	sig0_ocean_mle3_compression_qual
N.A.	sig0_adaptive_compression_qual
qual_alt_1hz_sig0_c	sig0_ocean_compression_qual
qual_alt_1hz_off_nadir_angle_wf_ku	off_nadir_angle_wf_ocean_compression_qual
qual_inst_corr_1hz_range_ku	range_cor_ocean_net_instr_qual
qual_inst_corr_1hz_range_ku_mle3	N.A.
qual_inst_corr_1hz_range_c	range_cor_ocean_net_instr_qual
qual_inst_corr_1hz_swh_ku	swh_cor_ocean_net_instr_qual
qual_inst_corr_1hz_swh_ku_mle3	N.A
qual_inst_corr_1hz_swh_c	swh_cor_ocean_net_instr_qual
qual_inst_corr_1hz_sig0_ku	sig0_cor_ocean_net_instr_qual
qual_inst_corr_1hz_sig0_ku_mle3	N.A
qual_inst_corr_1hz_sig0_c	sig0_cor_ocean_net_instr_qual
qual_rad_1hz_tb187	rad_tb_187_qual
qual_rad_1hz_tb238	rad_tb_238_qual
qual_rad_1hz_tb340	rad_tb_340_qual
rad_averaging_flag	rad_averaging_flag
rad_land_frac_187	rad_land_frac_187
rad_land_frac_238	rad_land_frac_238
rad_land_frac_340	rad_land_frac_340
alt_state_flag_oper	alt_state_oper_flag
alt_state_flag_c_band	alt_state_c_band_flag
alt_state_flag_band_seq	alt_state_band_seq_flag
alt_state_flag_ku_band_status	alt_state_band_status_flag
alt_state_flag_c_band_status	alt_state_band_status_flag
alt_state_flag_acq_mode_20hz	alt_state_acq_mode_flag

alt_state_flag_track_trans_20hz	alt_state_track_trans_flag
rad_state_flag_oper	rad_state_oper_flag
orb_state_flag_diode	orb_state_diode_flag
orb_state_flag_rest	orb_state_rest_flag
ecmwf_meteo_map_avail	meteo_map_availability_flag
N.A.	wave_model_map_availability_flag
N.A.	sig0_cor_atm_source
rain_flag	rain_flag
rad_rain_flag	rad_rain_flag
ice_flag	ice_flag
rad_sea_ice_flag	rad_sea_ice_flag
interp_flag_tb	rad_tb_interp_qual
interp_flag_mean_sea_surface	mean_sea_surface_cnescls_interp_qual
N.A.	mean_sea_surface_dtu_interp_qual
interp_flag_mdt	mean_dynamic_topography_interp_qual
interp_flag_ocean_tide_sol1	ocean_tide_got_interp_qual
interp_flag_ocean_tide_sol2	ocean_tide_fes_interp_qual
N.A.	internal_tide_interp_qual
interp_flag_meteo	meteo_zero_altitude_interp_qual
N.A.	meteo_measurement_altitude_interp_qual
N.A.	sea_ice_concentration_interp_qual
N.A.	wave_model_interp_qual
ice_qual_flag_20hz_ku	ocog_qual
N.A.	iono_cor_alt_filtered_qual
N.A.	iono_cor_alt_filtered_mle3_qual
N.A.	iono_cor_alt_filtered_adaptative_qual
alt	altitude
alt_20hz	altitude
orb_alt_rate	altitude_rate
tracker_20hz_ku	tracker_range_calibrated
tracker_20hz_c	tracker_range_calibrated
tracker_diode_20hz_ku	tracker_range_diode
N.A.	tracker_range_counter
N.A.	tracker_range_rate_counter
range_ku	range_ocean
range_ku_mle3	range_ocean_mle3
N.A.	range_adaptive
range_c	range_ocean
range_20hz_ku	range_ocean

range_20hz_ku_mle3	range_ocean_mle3
range_20hz_c	range_ocean
range_used_20hz_ku	range_ocean_compression_qual
range_used_20hz_ku_mle3	range_ocean_mle3_compression_qual
N.A.	range_adaptive_compression_qual
range_used_20hz_c	range_ocean_compression_qual
range_rms_ku	range_ocean_rms
range_rms_ku_mle3	range_ocean_mle3_rms
N.A.	range_adaptive_rms
range_rms_c	range_ocean_rms
range_numval_ku	range_ocean_numval
range_numval_ku_mle3	range_ocean_mle3_numval
N.A.	range_adaptive_numval
range_numval_c	range_ocean_numval
model_dry_tropo_corr	model_dry_tropo_cor_zero_altitude
N.A.	model_dry_tropo_cor_measurement_altitude
model_wet_tropo_corr	model_wet_tropo_cor_zero_altitude
N.A.	model_wet_tropo_cor_measurement_altitude
rad_wet_tropo_corr	rad_wet_tropo_cor
N.A.	surface_slope_cor
iono_corr_alt_ku	iono_cor_alt
iono_corr_alt_ku_mle3	iono_cor_alt_mle3
N.A.	iono_cor_alt_adaptive
N.A.	iono_cor_alt_filtered
N.A.	iono_cor_alt_filtered_mle3
N.A.	iono_cor_alt_filtered_adaptive
iono_corr_gim_ku	iono_cor_gim
sea_state_bias_ku	sea_state_bias
sea_state_bias_ku_mle3	sea_state_bias_mle3
N.A.	sea_state_bias_adaptive
sea_state_bias_c	sea_state_bias
sea_state_bias_c_mle3	sea_state_bias_mle3
N.A.	sea_state_bias_3d_mp2
N.A.	sea_state_bias_adaptive_3d_mp2
net_instr_corr_range_ku	range_cor_ocean_net_instr
net_instr_corr_range_ku_mle3	range_cor_ocean_mle3_net_instr
N.A.	range_cor_adaptive_net_instr
net_instr_corr_range_c	range_cor_ocean_net_instr
uso_corr	range_cor_uso

internal_path_delay_corr_ku	range_cor_internal_path
internal_path_delay_corr_c	range_cor_internal_path
modeled_instr_corr_range_ku	range_cor_ocean_model_instr
modeled_instr_corr_range_ku_mle3	range_cor_ocean_mle3_model_instr
modeled_instr_corr_range_c	range_cor_ocean_model_instr
doppler_corr_ku	range_cor_doppler
doppler_corr_c	range_cor_doppler
cog_corr	range_cor_cog
swh_ku	swh_ocean
swh_ku_mle3	swh_ocean_mle3
N.A.	swh_adaptive
swh_c	swh_ocean
swh_20hz_ku	swh_ocean
swh_20hz_ku_mle3	swh_ocean_mle3
swh_20hz_c	swh_ocean
swh_used_20hz_ku	swh_ocean_compression_qual
swh_used_20hz_ku_mle3	swh_ocean_mle3_compression_qual
N.A.	swh_adaptive_compression_qual
swh_used_20hz_c	swh_ocean_compression_qual
swh_rms_ku	swh_ocean_rms
swh_rms_ku_mle3	swh_ocean_mle3_rms
N.A.	swh_adaptive_rms
swh_rms_c	swh_ocean_rms
swh_numval_ku	swh_ocean_numval
swh_numval_ku_mle3	swh_ocean_mle3_numval
N.A.	swh_adaptive_numval
swh_numval_c	swh_ocean_numval
net_instr_corr_swh_ku	swh_cor_ocean_net_instr
net_instr_corr_swh_ku_mle3	swh_cor_ocean_mle3_net_instr
N.A	swh_cor_adaptive_net_instr
net_instr_corr_swh_c	swh_cor_ocean_net_instr
modeled_instr_corr_swh_ku	swh_cor_ocean_model_instr
modeled_instr_corr_swh_ku_mle3	swh_cor_ocean_mle3_model_instr
modeled_instr_corr_swh_c	swh_cor_ocean_model_instr
sig0_ku	sig0_ocean
sig0_ku_mle3	sig0_ocean_mle3
N.A.	sig0_adaptive
sig0_c	sig0_ocean
sig0_20hz_ku	sig0_ocean

sig0_20hz_ku_mle3	sig0_ocean_mle3
sig0_20hz_c	sig0_ocean
sig0_used_20hz_ku	sig0_ocean_compression_qual
sig0_used_20hz_ku_mle3	sig0_ocean_mle3_compression_qual
N.A.	sig0_adaptive_compression_qual
sig0_used_20hz_c	sig0_ocean_compression_qual
sig0_rms_ku	sig0_ocean_rms
sig0_rms_ku_mle3	sig0_ocean_mle3_rms
N.A.	sig0_adaptive_rms
sig0_rms_c	sig0_ocean_rms
sig0_numval_ku	sig0_ocean_numval
sig0_numval_ku_mle3	sig0_ocean_mle3_numval
N.A.	sig0_adaptive_numval
sig0_numval_c	sig0_ocean_numval
atmos_corr_sig0_ku	sig0_cor_atm
atmos_corr_sig0_c	sig0_cor_atm
net_instr_corr_sig0_ku	sig0_cor_ocean_net_instr
net_instr_corr_sig0_ku_mle3	sig0_cor_ocean_mle3_net_instr
N.A.	sig0_cor_adaptive_net_instr
net_instr_corr_sig0_c	sig0_cor_ocean_net_instr
internal_corr_sig0_ku	sig0_cor_calibration
internal_corr_sig0_c	sig0_cor_calibration
modeled_instr_corr_sig0_ku	sig0_cor_ocean_model_instr
modeled_instr_corr_sig0_ku_mle3	sig0_cor_ocean_mle3_model_instr
modeled_instr_corr_sig0_c	sig0_cor_ocean_model_instr
agc_20hz_ku	agc
agc_20hz_c	agc
agc_ku	agc
agc_c	agc
agc_rms_ku	agc_rms
agc_rms_c	agc_rms
agc_numval_ku	agc_numval
agc_numval_c	agc_numval
scaling_factor_20hz_ku	sig0_scaling_factor
scaling_factor_20hz_c	sig0_scaling_factor
agc_corr_ku_20	agc_cor
agc_corr_c_20	agc_cor
mean_sea_surface_sol1	mean_sea_surface_cnescls
N.A.	mean_sea_surface_dtu

mean_topography	mean_dynamic_topography
geoid	geoid
bathymetry	depth_or_elevation
inv_bar_corr	inv_bar_cor
hf_fluctuations_corr	dac
ocean_tide_sol1	ocean_tide_got
ocean_tide_sol2	ocean_tide_fes
ocean_tide_equil	ocean_tide_eq
ocean_tide_non_equil	ocean_tide_non_eq
load_tide_sol1	load_tide_got
load_tide_sol2	load_tide_fes
solid_earth_tide	solid_earth_tide
pole_tide	pole_tide
N.A.	internal_tide
wind_speed_model_u	wind_speed_mod_u
wind_speed_model_v	wind_speed_mod_v
wind_speed_alt	wind_speed_alt
wind_speed_alt_mle3	wind_speed_alt_mle3
N.A.	wind_speed_alt_adaptive
wind_speed_rad	rad_wind_speed
rad_water_vapor	rad_water_vapor
rad_liquid_water	rad_cloud_liquid_water
N.A.	sst
N.A.	mean_wave_period_t02
N.A.	mean_wave_direction
N.A.	sea_ice_concentration
ssha	ssha
ssha_mle3	ssha_mle3
off_nadir_angle_wf_ku	off_nadir_angle_wf_ocean
off_nadir_angle_wf_20hz_ku	off_nadir_angle_wf_ocean
off_nadir_angle_wf_used_20hz_ku	off_nadir_angle_wf_ocean_compression_qual
off_nadir_angle_wf_rms_ku	off_nadir_angle_wf_ocean_rms
off_nadir_angle_wf_numval_ku	off_nadir_angle_wf_ocean_numval
tb_187	rad_tmb_187
tb_238	rad_tmb_238
tb_340	rad_tmb_340
tb_187_smoothed	rad_tb_187
tb_238_smoothed	rad_tb_238
tb_340_smoothed	rad_tb_340

mqe_20hz_ku	mqe_ocean
mqe_20hz_ku_mle3	mqe_ocean_mle3
N.A.	mqe_adaptive
mqe_20hz_c	mqe_ocean
peakiness_20hz_ku	peakiness
peakiness_20hz_c	peakiness
N.A.	wvf_main_class
N.A.	wvf_main_class_score
N.A.	wvf_second_class
N.A.	wvf_second_class_score
ta_187	rad_ta_187
ta_238	rad_ta_238
ta_340	rad_ta_340
epoch_20hz_ku	epoch_ocean
epoch_20hz_ku_mle3	epoch_ocean_mle3
N.A.	epoch_adaptive
epoch_20hz_c	epoch_ocean
width_leading_edge_20hz_ku	sigmac_ocean
width_leading_edge_20hz_ku_mle3	sigmac_ocean_mle3
width_leading_edge_20hz_c	sigmac_ocean
amplitude_20hz_ku	amplitude_ocean
amplitude_20hz_ku_mle3	amplitude_ocean_mle3
N.A.	amplitude_adaptive
amplitude_20hz_c	amplitude_ocean
thermal_noise_20hz_ku	noise_floor_ocean
thermal_noise_20hz_c	noise_floor_ocean
number_of_iterations_ku	num_iterations_ocean
number_of_iterations_ku_mle3	num_iterations_ocean_mle3
number_of_iterations_c	num_iterations_ocean
N.A.	num_iterations_adaptive
N.A.	noise_floor_adaptive
N.A.	gamma_adaptive
N.A.	convergence_criteria_adaptive
ice1_range_20hz_ku	range_ocog
ice1_range_20hz_c	range_ocog
ice1_sig0_20hz_ku	sig0_ocog
ice1_sig0_20hz_c	sig0_ocog
waveforms_20hz_ku	power_waveform
waveforms_20hz_c	power_waveform

5. LEVEL 2 VARIABLE AVAILABILITY

The table below show the variables available for each type of data set (SSHA, GDR and SGDR).

	dataset SSHA				Dataset GDR							dataset SGDR						
Parameter name - GDR-F	**/**	**data_01**			**/**	**data_01**			**data_20**			**/**	**data_01**			**data_20**		
	/	**/**	**ku**	**c**	**/**	**/**	**ku**	**c**	**/**	**ku**	**c**	**/**	**/**	**ku**	**c**	**/**	**ku**	**c**
time		x				x			x				x			x		
time_tai		x				x			x				x			x		
index_first_20hz_measurement						x							x					
numtotal_20hz_measurement						x							x					
index_1hz_measurement									x							x		
samples												x						
latitude		x				x			x				x			x		
longitude		x				x			x				x			x		
rad_surface_type_flag		x				x							x					
rad_distance_to_land						x							x					
surface_classification_flag		x				x			x				x			x		
angle_of_approach_to_coast						x			x				x			x		
distance_to_coast						x			x				x			x		
alt_qual		x																
rad_qual		x																
geo_qual		x																
range_ocean_compression_qual							x	x		x	x			x	x		x	x
range_ocean_mle3_compression_qual							x			x				x			x	
range_adaptive_compression_qual							x			x				x			x	
swh_ocean_compression_qual							x	x		x	x			x	x		x	x
swh_ocean_mle3_compression_qual							x			x				x			x	
swh_adaptive_compression_qual							x			x				x			x	
sig0_ocean_compression_qual							x	x		x	x			x	x		x	x
sig0_ocean_mle3_compression_qual							x			x				x			x	
sig0_adaptive_compression_qual							x			x				x			x	
off_nadir_angle_wf_ocean_compression_qual							x			x				x			x	
range_cor_ocean_net_instr_qual							x	x						x	x			
swh_cor_ocean_net_instr_qual							x	x						x	x			
sig0_cor_ocean_net_instr_qual							x	x						x	x			

Parameter name - GDR-F	dataset SSHA				Dataset GDR							dataset SGDR						
	/	data_01			/	data_01			data_20			/	data_01			data_20		
	/	/	ku	c	/	/	ku	c	/	ku	c	/	/	ku	c	/	ku	c
rad_tb_187_qual						x							x					
rad_tb_238_qual						x							x					
rad_tb_340_qual						x							x					
rad_averaging_flag						x							x					
rad_land_frac_187						x							x					
rad_land_frac_238						x							x					
rad_land_frac_340						x							x					
alt_state_oper_flag						x							x					
alt_state_c_band_flag								x							x			
alt_state_band_seq_flag						x							x					
alt_state_band_status_flag							x	x						x	x			
alt_state_acq_mode_flag									x							x		
alt_state_track_trans_flag									x							x		
rad_state_oper_flag						x							x					
orb_state_diode_flag						x							x					
orb_state_rest_flag						x							x					
meteo_map_availability_flag		x				x							x					
wave_model_map_availability_flag						x							x					
sig0_cor_atm_source						x							x					
rain_flag		x				x							x					
rad_rain_flag		x				x							x					
ice_flag		x				x							x					
rad_sea_ice_flag		x				x							x					
rad_tb_interp_qual						x							x					
mean_sea_surface_cnescls_interp_qual						x							x					
mean_sea_surface_dtu_interp_qual						x							x					
mean_dynamic_topography_interp_qual						x							x					
ocean_tide_got_interp_qual						x							x					
ocean_tide_fes_interp_qual						x							x					
internal_tide_interp_qual						x							x					
meteo_zero_altitude_interp_qual						x							x					
meteo_measurement_altitude_interp_qual						x			x				x			x		
sea_ice_concentration_interp_qual						x							x					
wave_model_interp_qual						x							x					
ocog_qual										x							x	

Parameter name - GDR-F	dataset SSHA				Dataset GDR							dataset SGDR						
	/	data_01			/	data_01			data_20			/	data_01			data_20		
	/	/	ku	c	/	/	ku	c	/	ku	c	/	/	ku	c	/	ku	c
iono_cor_alt_filtered_qual							x							x				
iono_cor_alt_filtered_mle3_qual							x							x				
iono_cor_alt_filtered_adaptative_qual							x							x				
altitude		x				x			x				x			x		
altitude_rate						x							x					
tracker_range_calibrated																	x	x
tracker_range_diode																	x	
tracker_range_counter																x		
tracker_range_rate_counter																x		
range_ocean			x				x	x		x	x			x	x		x	x
range_ocean_mle3			x				x			x				x			x	
range_adaptive							x			x				x			x	
range_ocean_rms							x	x						x	x			
range_ocean_mle3_rms							x							x				
range_adaptive_rms							x							x				
range_ocean_numval							x	x						x	x			
range_ocean_mle3_numval							x							x				
range_adaptive_numval							x							x				
model_dry_tropo_cor_zero_altitude		x				x							x					
model_dry_tropo_cor_measurement_altitude						x			x				x			x		
model_wet_tropo_cor_zero_altitude						x							x					
model_wet_tropo_cor_measurement_altitude						x			x				x			x		
rad_wet_tropo_cor		x				x							x					
surface_slope_cor						x			x				x			x		
iono_cor_alt							x							x				
iono_cor_alt_mle3							x							x				
iono_cor_alt_adaptive							x							x				
iono_cor_alt_filtered			x				x							x				
iono_cor_alt_filtered_mle3			x				x							x				
iono_cor_alt_filtered_adaptive							x							x				
iono_cor_gim							x							x				
sea_state_bias			x				x	x						x	x			
sea_state_bias_mle3			x				x	x						x	x			
sea_state_bias_adaptive							x	x						x	x			
sea_state_bias_3d_mp2							x							x				

Parameter name - GDR-F	dataset SSHA				Dataset GDR							dataset SGDR						
	/	data_01			/	data_01			data_20			/	data_01			data_20		
	/	/	ku	c	/	/	ku	c	/	ku	c	/	/	ku	c	/	ku	c
sea_state_bias_adaptive_3d_mp2							x							x				
range_cor_ocean_net_instr							x	x						x	x			
range_cor_ocean_mle3_net_instr							x							x				
range_cor_adaptive_net_instr							x							x				
range_cor_uso													x					
range_cor_internal_path														x	x			
range_cor_ocean_model_instr														x	x			
range_cor_ocean_mle3_model_instr														x				
range_cor_doppler														x	x			
range_cor_cog													x					
swh_ocean			x				x	x		x	x			x	x		x	x
swh_ocean_mle3			x				x			x				x			x	
swh_adaptive							x			x				x			x	
swh_ocean_rms							x	x						x	x			
swh_ocean_mle3_rms							x							x				
swh_adaptive_rms							x							x				
swh_ocean_numval							x	x						x	x			
swh_ocean_mle3_numval							x							x				
swh_adaptive_numval							x							x				
swh_cor_ocean_net_instr							x	x						x	x			
swh_cor_ocean_mle3_net_instr							x							x				
swh_cor_adaptive_net_instr							x							x				
swh_cor_ocean_model_instr														x	x			
swh_cor_ocean_mle3_model_instr														x				
sig0_ocean			x				x	x		x	x			x	x		x	x
sig0_ocean_mle3			x				x			x				x			x	
sig0_adaptive							x			x				x			x	
sig0_ocean_rms							x	x						x	x			
sig0_ocean_mle3_rms							x							x				
sig0_adaptive_rms							x							x				
sig0_ocean_numval							x	x						x	x			
sig0_ocean_mle3_numval							x							x				
sig0_adaptive_numval							x							x				
sig0_cor_atm							x	x						x	x			
sig0_cor_ocean_net_instr							x	x						x	x			

Parameter name - GDR-F	dataset SSHA				Dataset GDR							dataset SGDR						
	/	data_01			/	data_01			data_20			/	data_01			data_20		
	/	/	ku	c	/	/	ku	c	/	ku	c	/	/	ku	c	/	ku	c
sig0_cor_ocean_mle3_net_instr							x							x				
sig0_cor_adaptive_net_instr							x							x				
sig0_cor_calibration														x	x			
sig0_cor_ocean_model_instr														x	x			
sig0_cor_ocean_mle3_model_instr														x				
agc							x	x						x	x		x	x
agc_rms							x	x						x	x			
agc_numval							x	x						x	x			
sig0_scaling_factor																	x	x
agc_cor																	x	x
mean_sea_surface_cnescls		x				x							x					
mean_sea_surface_dtu						x							x					
mean_dynamic_topography		x				x							x					
geoid						x							x					
depth_or_elevation		x				x							x					
inv_bar_cor		x				x							x					
dac		x				x							x					
ocean_tide_got						x							x					
ocean_tide_fes		x				x							x					
ocean_tide_eq						x							x					
ocean_tide_non_eq						x							x					
load_tide_got						x							x					
load_tide_fes						x							x					
solid_earth_tide		x				x							x					
pole_tide		x				x							x					
internal_tide		x				x							x					
wind_speed_mod_u						x							x					
wind_speed_mod_v						x							x					
wind_speed_alt		x				x							x					
wind_speed_alt_mle3		x				x							x					
wind_speed_alt_adaptive						x							x					
rad_wind_speed						x							x					
rad_water_vapor		x				x							x					
rad_cloud_liquid_water		x				x							x					
sst						x							x					

Parameter name - GDR-F	dataset SSHA				Dataset GDR							dataset SGDR						
	/	data_01			/	data_01			data_20			/	data_01			data_20		
	/	/	ku	c	/	/	ku	c	/	ku	c	/	/	ku	c	/	ku	c
mean_wave_period_t02						x							x					
mean_wave_direction						x							x					
sea_ice_concentration						x							x					
ssha			x				x							x				
ssha_mle3			x				x							x				
off_nadir_angle_wf_ocean							x			x				x			x	
off_nadir_angle_wf_ocean_rms							x							x				
off_nadir_angle_wf_ocean_numval							x							x				
rad_tmb_187						x							x					
rad_tmb_238						x							x					
rad_tmb_340						x							x					
rad_tb_187						x							x					
rad_tb_238						x							x					
rad_tb_340						x							x					
mqe_ocean										x	x						x	x
mqe_ocean_mle3										x							x	
mqe_adaptive										x							x	
peakiness										x	x						x	x
wvf_main_class			x				x			x				x			x	
wvf_main_class_score																	x	
wvf_second_class																	x	
wvf_second_class_score																	x	
rad_ta_187													x					
rad_ta_238													x					
rad_ta_340													x					
epoch_ocean																	x	x
epoch_ocean_mle3																	x	
epoch_adaptive																	x	
sigmac_ocean																	x	x
sigmac_ocean_mle3																	x	
amplitude_ocean																	x	x
amplitude_ocean_mle3																	x	
amplitude_adaptive																	x	
noise_floor_ocean																	x	x
noise_floor_adaptive																	x	

Parameter name - GDR-F	dataset SSHA				Dataset GDR							dataset SGDR						
	/	data_01			/	data_01			data_20			/	data_01			data_20		
	/	/	ku	c	/	/	ku	c	/	ku	c	/	/	ku	c	/	ku	c
gamma_adaptive																	x	
convergence_criteria_adaptive																	x	
num_iterations_ocean										x	x						x	x
num_iterations_ocean_mle3										x							x	
num_iterations_adaptive										x							x	
range_ocog										x	x						x	x
sig0_ocog										x	x						x	x
power_waveform																	x	x

6. SSHA DATA SET

```
netcdf ssha {
```

// 1-Hz data

```
group: data_01 {

  dimensions:
    time = < number of measurements >;

  variables:
```

// Time Tag

```
double time(time);
       time:long_name = "time in UTC";
       time:standard_name = "time";
       time:calendar = "gregorian";
       time:tai_utc_difference =  < Value of TAI-UTC at time of first record >;
       time:leap_second = < UTC time of the leap second (YYYY-MM-DD hh:mm:ss) >;
       time:units = "seconds since 2000-01-01 00:00:00.0";
       time:comment = "Time of measurement in seconds in the UTC time scale since 1 Jan
2000 00:00:00 UTC. [tai_utc_difference] is the difference between TAI and UTC reference
time (seconds) for the first measurement of the data set. If a leap second occurs within
the data set, the attribute [leap_second] is set to the UTC time at which the leap second
occurs.";

double time_tai(time);
       time_tai:_FillValue = 18446744073709551616.000000;
       time_tai:long_name = "time in TAI";
       time_tai:standard_name = "time";
       time_tai:calendar = "gregorian";
       time_tai:units = "seconds since 2000-01-01 00:00:00.0";
       time_tai:comment = "Time of measurement in seconds in the TAI time scale since 1
Jan 2000 00:00:00 TAI. This time scale contains no leap seconds. The difference (in
seconds) with time in UTC is given by the attribute [time:tai_utc_difference].";
```

// Location and surface type

```
int latitude(time);
       latitude:_FillValue = 2147483647;
       latitude:long_name = "latitude";
       latitude:standard_name = "latitude";
       latitude:units = "degrees_north";
       latitude:scale_factor = 1.00e-06;
       latitude:comment = "Named lat in GDR-D standard. Positive latitude is North
latitude, negative latitude is South latitude. See Jason-3 User Handbook. Associated
quality flag is orb_state_diode_flag for the OGDR products, orb_state_rest_flag for the
IGDR and GDR products";

int longitude(time);
       longitude:_FillValue = 2147483647;
       longitude:long_name = "longitude";
       longitude:standard_name = "longitude";
       longitude:units = "degrees_east";
       longitude:scale_factor = 1.00e-06;
```

```
      longitude:comment = "Named lon in GDR-D standard. East longitude relative to
Greenwich meridian. See Jason-3 User Handbook. Associated quality flag is
orb_state_diode_flag for the OGDR products, orb_state_rest_flag for the IGDR and GDR
products";

byte surface_classification_flag(time);
      surface_classification_flag:_FillValue = 127b;
      surface_classification_flag:long_name = "surface classification";
      surface_classification_flag:flag_meanings = "open_ocean land continental_water
aquatic_vegetation continental_ice_snow floating_ice salted_basin";
      surface_classification_flag:flag_values = 0b, 1b, 2b, 3b, 4b, 5b, 6b;
      surface_classification_flag:coordinates = "longitude latitude";
      surface_classification_flag:comment = "Computed from a mask built with MODIS and
GlobCover data";

byte rad_surface_type_flag(time);
      rad_surface_type_flag:_FillValue = 127b;
      rad_surface_type_flag:long_name = "radiometer surface type";
      rad_surface_type_flag:flag_meanings = "open_ocean near_coast land";
      rad_surface_type_flag:flag_values = 0b, 1b, 2b;
      rad_surface_type_flag:coordinates = "longitude latitude";
      rad_surface_type_flag:comment = "Named rad_surf_type in GDR-D standard. The
radiometer surface type flag is applicable to the radiometer wet troposphere path delays
provided by rad_wet_tropo_cor. A value of 0 indicates that open ocean processing is used
to compute the path delay, 1 indicates coastal processing is used, and 2 indicates the
path delay is invalid due to land";

byte surface_classification_flag(time);
      surface_classification_flag:_FillValue = 127b;
      surface_classification_flag:long_name = "surface classification";
      surface_classification_flag:flag_meanings = "open_ocean land continental_water
aquatic_vegetation continental_ice_snow floating_ice salted_basin";
      surface_classification_flag:flag_values = 0b, 1b, 2b, 3b, 4b, 5b, 6b;
      surface_classification_flag:coordinates = "longitude latitude";
      surface_classification_flag:comment = "Computed from a mask built with MODIS and
GlobCover data";
```

// Quality information

```
byte alt_qual(time);
      alt_qual:_FillValue = 127b;
      alt_qual:long_name = "altimeter quality flag";
      alt_qual:flag_meanings = "good bad";
      alt_qual:flag_values = 0b, 1b;
      alt_qual:coordinates = "longitude latitude";
      alt_qual:comment = "Named alt_quality_flag in GDR-D standard. Compilation of all
altimeter flags except altimeter echo type : Set to default in the current issue";

byte rad_qual(time);
      rad_qual:_FillValue = 127b;
      rad_qual:long_name = "radiometer quality flag";
      rad_qual:flag_meanings = "good bad";
      rad_qual:flag_values = 0b, 1b;
      rad_qual:coordinates = "longitude latitude";
      rad_qual:comment = "Named rad_quality_flag in GDR-D standard. Compilation of all
radiometer flags except radiometer surface type : Set to default in the current issue";

byte geo_qual(time);
      geo_qual:_FillValue = 127b;
      geo_qual:long_name = "geophysical quality flag";
      geo_qual:flag_meanings = "good bad";
      geo_qual:flag_values = 0b, 1b;
```

```
      geo_qual:coordinates = "longitude latitude";
      geo_qual:comment = "Named geophysical_quality_flag in GDR-D standard. Check on
validity of all geophysical fields : Set to default in the current issue";

byte meteo_map_availability_flag(time);
      meteo_map_availability_flag:_FillValue = 127b;
      meteo_map_availability_flag:long_name = "ECMWF meteorological map availability";
      meteo_map_availability_flag:flag_meanings = "2_maps_nominal 2_maps_degraded
1_map_closest_used no_valid_map";
      meteo_map_availability_flag:flag_values = 0b, 1b, 2b, 3b;
      meteo_map_availability_flag:coordinates = "longitude latitude";
      meteo_map_availability_flag:comment = "Named ecmwf_meteo_map_avail in GDR-D
standard. Possible values are: 0 meaning '2 maps, nominal' (six hours apart), 1 meaning
'2 maps, degraded' (more than six hours apart), 2 meaning '1 map, closest map used', 3
meaning ''no valid map''";

byte rain_flag(time);
      rain_flag:_FillValue = 127b;
      rain_flag:long_name = "rain flag";
      rain_flag:flag_meanings = "no_rain rain high_rain_probability_from_altimeter
high_probability_of_no_rain_from_altimeter ambiguous_situation_possibility_of_ice
evaluation_not_possible";
      rain_flag:flag_values = 0b, 1b, 2b, 3b, 4b, 5b;
      rain_flag:coordinates = "longitude latitude";
      rain_flag:comment = "See Jason-3 User Handbook . A bias of -0.231 dB (Ku Band) / -
0.012 dB (C Band) has been added to the backscatter coefficient
(/data_01/ocean/sig0_ocean_mle3 / /data_01/c/sig0_ocean) before computing the rain flag";

byte rad_rain_flag(time);
      rad_rain_flag:_FillValue = 127b;
      rad_rain_flag:long_name = "radiometer rain flag";
      rad_rain_flag:flag_values = 0b, 1b;
      rad_rain_flag:flag_meanings = "no_rain rain";
      rad_rain_flag:flag_values = 0b, 1b;
      rad_rain_flag:coordinates = "longitude latitude";
      rad_rain_flag:comment = "See Jason-3 User Handbook. The radiometer rain flag
indicates where the radiometer wet troposphere path delay (rad_wet_tropo_cor) is invalid
due to rain contamination";


byte ice_flag(time);
      ice_flag:_FillValue = 127b;
      ice_flag:long_name = "ice flag";
      ice_flag:flag_meanings = "no_ice ice";
      ice_flag:flag_values = 0b, 1b;
      ice_flag:coordinates = "longitude latitude";
      ice_flag:comment = "See Jason-3 User Handbook";


byte rad_sea_ice_flag(time);
      rad_sea_ice_flag:_FillValue = 127b;
      rad_sea_ice_flag:long_name = "radiometer sea-ice flag";
      rad_sea_ice_flag:flag_meanings = "no_sea_ice sea_ice";
      rad_sea_ice_flag:flag_values = 0b, 1b;
      rad_sea_ice_flag:coordinates = "longitude latitude";
      rad_sea_ice_flag:comment = "See Jason-3 User Handbook. The radiometer sea ice flag
indicates where the radiometer wet troposphere path delay (rad_wet_tropo_cor) is invalid
due to sea ice contamination";
```

// Orbit

```
int altitude(time);
      altitude:_FillValue = 2147483647;
```

```
        altitude:long_name = "1 Hz altitude of satellite";
        altitude:standard_name = "height_above_reference_ellipsoid";
        altitude:units = "m";
        altitude:add_offset = 1.300000e+06;
        altitude:scale_factor = 1.00e-04;
        altitude:coordinates = "longitude latitude";
        altitude:comment = "Named alt in GDR-D standard. Altitude of satellite above the
reference ellipsoid. Associated quality flag is orb_state_diode_flag for the OGDR
products, orb_state_rest_flag for the IGDR and GDR products";
```

// Altimeter range corrections

```
short model_dry_tropo_cor_zero_altitude(time);
        model_dry_tropo_cor_zero_altitude:_FillValue = 32767s;
        model_dry_tropo_cor_zero_altitude:long_name = "model dry tropospheric correction
at zero altitude";
        model_dry_tropo_cor_zero_altitude:standard_name =
"altimeter_range_correction_due_to_dry_troposphere";
        model_dry_tropo_cor_zero_altitude:source = "European Center for Medium Range
Weather Forecasting";
        model_dry_tropo_cor_zero_altitude:institution = "ECMWF";
        model_dry_tropo_cor_zero_altitude:units = "m";
        model_dry_tropo_cor_zero_altitude:scale_factor = 1.00e-04;
        model_dry_tropo_cor_zero_altitude:coordinates = "longitude latitude";
        model_dry_tropo_cor_zero_altitude:comment = "Named model_dry_tropo_corr in GDR-D
standard. Computed at the altimeter time-tag from the interpolation of 2 meteorological
fields that surround the altimeter time-tag. A dry tropospheric correction must be added
(negative value) to the instrument range to correct this range measurement for dry
tropospheric range delays of the radar pulse. See Jason-3 User Handbook";

short rad_wet_tropo_cor(time);
        rad_wet_tropo_cor:_FillValue = 32767s;
        rad_wet_tropo_cor:long_name = "radiometer wet tropospheric correction";
        rad_wet_tropo_cor:standard_name =
"altimeter_range_correction_due_to_wet_troposphere";
        rad_wet_tropo_cor:source = "AMR";
        rad_wet_tropo_cor:institution = "NASA/JPL";
        rad_wet_tropo_cor:units = "m";
        rad_wet_tropo_cor:scale_factor = 1.00e-04;
        rad_wet_tropo_cor:coordinates = "longitude latitude";
        rad_wet_tropo_cor:comment = "Named rad_wet_tropo_corr in GDR-D standard. A wet
tropospheric correction must be added (negative value) to the instrument range to correct
this range measurement for wet tropospheric range delays of the radar pulse";
```

// Geophysical parameters

```
int mean_sea_surface_cnescls(time);
        mean_sea_surface_cnescls:_FillValue = 2147483647;
        mean_sea_surface_cnescls:long_name = "mean sea surface height (CNES/CLS solution)
above reference ellipsoid";
        mean_sea_surface_cnescls:source = < mean_sea_surface_cnescls_source >;
        mean_sea_surface_cnescls:institution = < mean_sea_surface_cnescls_institution >;
        mean_sea_surface_cnescls:units = "m";
        mean_sea_surface_cnescls:scale_factor = 1.00e-04;
        mean_sea_surface_cnescls:coordinates = "longitude latitude";
        mean_sea_surface_cnescls:comment = "Named mean_sea_surface_sol1 in GDR-D standard.
See Jason-3 User Handbook";

int mean_dynamic_topography(time);
        mean_dynamic_topography:_FillValue = 2147483647;
        mean_dynamic_topography:long_name = "mean dynamic topography above geoid";
        mean_dynamic_topography:source = < mdt_source >;
```

```
       mean_dynamic_topography:institution = < mdt_institution >;
       mean_dynamic_topography:units = "m";
       mean_dynamic_topography:scale_factor = 1.00e-04;
       mean_dynamic_topography:coordinates = "longitude latitude";
       mean_dynamic_topography:comment = "Named mean_topography in GDR-D standard. See
Jason-3 User Handbook";

int depth_or_elevation(time);
       depth_or_elevation:_FillValue = 2147483647;
       depth_or_elevation:long_name = "ocean depth/land elevation";
       depth_or_elevation:source = < bathy_topo_source >;
       depth_or_elevation:institution = < bathy_topo_institution >;
       depth_or_elevation:units = "m";
       depth_or_elevation:coordinates = "longitude latitude";
       depth_or_elevation:comment = "Named bathymetry in GDR-D standard.";

short inv_bar_cor(time);
       inv_bar_cor:_FillValue = 32767s;
       inv_bar_cor:long_name = "inverted barometer height correction";
       inv_bar_cor:standard_name =
"sea_surface_height_correction_due_to_air_pressure_at_low_frequency";
       inv_bar_cor:source = "European Center for Medium Range Weather Forecasting";
       inv_bar_cor:institution = "ECMWF";
       inv_bar_cor:units = "m";
       inv_bar_cor:scale_factor = 1.00e-04;
       inv_bar_cor:coordinates = "longitude latitude";
       inv_bar_cor:comment = "Named inv_bar_corr in GDR-D standard. Computed at the
altimeter time-tag from the interpolation of 2 meteorological fields that surround the
altimeter time-tag. See Jason-3 User Handbook";

short dac(time);
       dac:_FillValue = 32767s;
       dac:long_name = "dynamic atmospheric correction";
       dac:institution = "LEGOS/CLS/CNES";
       dac:units = "m";
       dac:scale_factor = 1.00e-04;
       dac:coordinates = "longitude latitude";
       dac:comment = "Sum of the high frequency fluctuations correction (named
hf_fluctuations_corr in GDR-D standard) and of the low frequency inverted barometer
correction (inv_bar_cor). See Jason-3 User Handbook";

int ocean_tide_fes(time);
       ocean_tide_fes:_FillValue = 2147483647;
       ocean_tide_fes:long_name = "geocentric ocean tide height (FES solution)";
       ocean_tide_fes:standard_name =
"sea_surface_height_amplitude_due_to_geocentric_ocean_tide";
       ocean_tide_fes:source = < ocean_tide_fes_source >;
       ocean_tide_fes:institution = < ocean_tide_fes_institution >;
       ocean_tide_fes:units = "m";
       ocean_tide_fes:scale_factor = 1.00e-04;
       ocean_tide_fes:coordinates = "longitude latitude";
       ocean_tide_fes:comment = "Named ocean_tide_sol2 in GDR-D standard. Includes the
equilibrium long-period ocean tide height and the short-period part of the corresponding
loading tide. The permanent tide (zero frequency) is not included in this parameter
because it is included in the geoid and mean sea surface (geoid,
mean_sea_surface_cnescls). See Jason-3 User Handbook";

short solid_earth_tide(time);
       solid_earth_tide:_FillValue = 32767s;
       solid_earth_tide:long_name = "solid earth tide height";
       solid_earth_tide:standard_name = "sea_surface_height_amplitude_due_to_earth_tide";
       solid_earth_tide:source = < solid_earth_tide_source >;
       solid_earth_tide:units = "m";
       solid_earth_tide:scale_factor = 1.00e-04;
       solid_earth_tide:coordinates = "longitude latitude";
```

solid_earth_tide:comment = "Calculated using Cartwright and Tayler tables and consisting of the second and third degree constituents. The permanent tide (zero frequency) is not included. See Jason-3 User Handbook";

short pole_tide(time);
pole_tide:_FillValue = 32767s;
pole_tide:long_name = "geocentric pole tide height";
pole_tide:standard_name = "sea_surface_height_amplitude_due_to_pole_tide";
pole_tide:source = < pole_tide_source >;
pole_tide:units = "m";
pole_tide:scale_factor = 1.00e-04;
pole_tide:coordinates = "longitude latitude";
pole_tide:comment = "See Jason-3 User Handbook";

short internal_tide(time);
internal_tide:_FillValue = 32767s;
internal_tide:long_name = "internal tide height";
internal_tide:source = < internal_tide_source >;
internal_tide:units = "m";
internal_tide:scale_factor = 1.00e-04;
internal_tide:coordinates = "longitude latitude";
internal_tide:comment = "See Jason-3 User Handbook";

// Environmental parameters

short wind_speed_alt(time);
wind_speed_alt:_FillValue = 32767s;
wind_speed_alt:long_name = "altimeter wind speed";
wind_speed_alt:standard_name = "wind_speed";
wind_speed_alt:units = "m/s";
wind_speed_alt:scale_factor = 1.00e-02;
wind_speed_alt:coordinates = "longitude latitude";
wind_speed_alt:comment = "Should not be used over land. See Jason-3 User Handbook. A calibration bias of +0.14 06 dB has been added to the Ku band backscatter coefficient (/data_01/ku/sig0_ocean) before computing the wind speed";

short wind_speed_alt_mle3(time);
wind_speed_alt_mle3:_FillValue = 32767s;
wind_speed_alt_mle3:long_name = "altimeter wind speed (MLE3 retracking)";
wind_speed_alt_mle3:standard_name = "wind_speed";
wind_speed_alt_mle3:units = "m/s";
wind_speed_alt_mle3:scale_factor = 1.00e-02;
wind_speed_alt_mle3:coordinates = "longitude latitude";
wind_speed_alt_mle3:comment = "Should not be used over land. See Jason-3 User Handbook. A calibration bias of +0.109 dB has been added to the Ku band backscatter coefficient (/data_01/ku/sig0_ocean_mle3) before computing the wind speed";

short rad_water_vapor(time);
rad_water_vapor:_FillValue = 32767s;
rad_water_vapor:long_name = "radiometer water vapor content";
rad_water_vapor:standard_name = "atmosphere_water_vapor_content";
rad_water_vapor:source = "AMR";
rad_water_vapor:institution = "NASA/JPL";
rad_water_vapor:units = "kg/m^2";
rad_water_vapor:scale_factor = 1.00e-01;
rad_water_vapor:coordinates = "longitude latitude";
rad_water_vapor:comment = "Should not be used over land";

short rad_cloud_liquid_water(time);
rad_cloud_liquid_water:_FillValue = 32767s;
rad_cloud_liquid_water:long_name = "radiometer liquid water content";
rad_cloud_liquid_water:standard_name = "atmosphere_cloud_liquid_water_content";
rad_cloud_liquid_water:source = "AMR";

```
      rad_cloud_liquid_water:institution = "NASA/JPL";
      rad_cloud_liquid_water:units = "kg/m^2";
      rad_cloud_liquid_water:scale_factor = 1.00e-02;
      rad_cloud_liquid_water:coordinates = "longitude latitude";
      rad_cloud_liquid_water:comment = "Named rad_liquid_water in GDR-D standard. Should
not be used over land";
```

// 1 Hz Ku band data

```
group: ku {

   variables:
```

// Altimeter range

```
int range_ocean(time);
      range_ocean:_FillValue = 2147483647;
      range_ocean:long_name = "1 Hz Ku band corrected altimeter range";
      range_ocean:standard_name = "altimeter_range";
      range_ocean:units = "m";
      range_ocean:add_offset = 1.300000e+06;
      range_ocean:scale_factor = 1.00e-04;
      range_ocean:coordinates = "/data_01/longitude /data_01/latitude";
      range_ocean:comment = "Named range_ku in GDR-D standard. All instrumental
corrections included, i.e. distance antenna-COG (/data_01/range_cor_cog), USO drift
correction (/data_01/range_cor_uso), internal path correction (range_cor_internal_path),
Doppler correction (range_cor_doppler), modeled instrumental errors correction
(range_cor_ocean_model_instr) and system bias";

int range_ocean_mle3(time);
      range_ocean_mle3:_FillValue = 2147483647;
      range_ocean_mle3:long_name = "1 Hz Ku band corrected altimeter range (MLE3
retracking)";
      range_ocean_mle3:standard_name = "altimeter_range";
      range_ocean_mle3:units = "m";
      range_ocean_mle3:add_offset = 1.300000e+06;
      range_ocean_mle3:scale_factor = 1.00e-04;
      range_ocean_mle3:coordinates = "/data_01/longitude /data_01/latitude";
      range_ocean_mle3:comment = "Named range_ku_mle3 in GDR-D standard. All
instrumental corrections included, i.e. distance antenna-COG (/data_01/range_cor_cog),
USO drift correction (/data_01/range_cor_uso), internal path correction
(range_cor_internal_path), Doppler correction (range_cor_doppler), modeled instrumental
errors correction (range_cor_ocean_mle3_model_instr) and system bias";
```

// Altimeter range corrections

```
short iono_cor_alt_filtered(time);
      iono_cor_alt_filtered:_FillValue = 32767s;
      iono_cor_alt_filtered:long_name = "filtered altimeter ionospheric correction on Ku
band";
      iono_cor_alt_filtered:standard_name =
"altimeter_range_correction_due_to_ionosphere";
      iono_cor_alt_filtered:source = "Poseidon-3B";
      iono_cor_alt_filtered:institution = "CNES";
      iono_cor_alt_filtered:units = "m";
      iono_cor_alt_filtered:scale_factor = 1.00e-04;
      iono_cor_alt_filtered:coordinates = "/data_01/longitude /data_01/latitude";
      iono_cor_alt_filtered:comment = "An ionospheric correction must be added (negative
value) to the instrument range to correct this range measurement for ionospheric range
delays of the radar pulse. See Jason-3 User Handbook";
```

short iono_cor_alt_filtered_mle3(time);
iono_cor_alt_filtered_mle3:_FillValue = 32767s;
iono_cor_alt_filtered_mle3:long_name = "filtered altimeter ionospheric correction on Ku band (MLE3 retracking)";
iono_cor_alt_filtered_mle3:standard_name = "altimeter_range_correction_due_to_ionosphere";
iono_cor_alt_filtered_mle3:source = "Poseidon-3B";
iono_cor_alt_filtered_mle3:institution = "CNES";
iono_cor_alt_filtered_mle3:units = "m";
iono_cor_alt_filtered_mle3:scale_factor = 1.00e-04;
iono_cor_alt_filtered_mle3:coordinates = "/data_01/longitude /data_01/latitude";
iono_cor_alt_filtered_mle3:comment = "An ionospheric correction must be added (negative value) to the instrument range to correct this range measurement for ionospheric range delays of the radar pulse. See Jason-3 User Handbook";

short sea_state_bias(time);
sea_state_bias:_FillValue = 32767s;
sea_state_bias:long_name = "sea state bias correction in Ku band";
sea_state_bias:standard_name = "sea_surface_height_bias_due_to_sea_surface_roughness";
sea_state_bias:source = < ssb_source >;
sea_state_bias:institution = < ssb_institution >;
sea_state_bias:units = "m";
sea_state_bias:scale_factor = 1.00e-04;
sea_state_bias:coordinates = "/data_01/longitude /data_01/latitude";
sea_state_bias:comment = "Named sea_state_bias_ku in GDR-D standard. A sea state bias correction must be added (negative value) to the instrument range to correct this range measurement for sea state delays of the radar pulse. This element should not be used over land. See Jason-3 User Handbook";

short sea_state_bias_mle3(time);
sea_state_bias_mle3:_FillValue = 32767s;
sea_state_bias_mle3:long_name = "sea state bias correction in Ku band (MLE3 retracking)";
sea_state_bias_mle3:standard_name = "sea_surface_height_bias_due_to_sea_surface_roughness";
sea_state_bias_mle3:source = < ssb_mle3_source >;
sea_state_bias_mle3:institution = < ssb_mle3_institution >;
sea_state_bias_mle3:units = "m";
sea_state_bias_mle3:scale_factor = 1.00e-04;
sea_state_bias_mle3:coordinates = "/data_01/longitude /data_01/latitude";
sea_state_bias_mle3:comment = "Named sea_state_bias_ku_mle3 in GDR-D standard. A sea state bias correction must be added (negative value) to the instrument range to correct this range measurement for sea state delays of the radar pulse. This element should not be used over land. See Jason-3 User Handbook";

// Significant waveheight

short swh_ocean(time);
swh_ocean:_FillValue = 32767s;
swh_ocean:long_name = "Ku band corrected significant waveheight";
swh_ocean:standard_name = "sea_surface_wave_significant_height";
swh_ocean:units = "m";
swh_ocean:scale_factor = 1.00e-03;
swh_ocean:coordinates = "/data_01/longitude /data_01/latitude";
swh_ocean:comment = "Named swh_ku in GDR-D standard. All instrumental corrections included, i.e. modeled instrumental errors correction (swh_cor_ocean_model_instr) and system bias";

short swh_ocean_mle3(time);
swh_ocean_mle3:_FillValue = 32767s;
swh_ocean_mle3:long_name = "Ku band corrected significant waveheight (MLE3 retracking)";

```
       swh_ocean_mle3:standard_name = "sea_surface_wave_significant_height";
       swh_ocean_mle3:units = "m";
       swh_ocean_mle3:scale_factor = 1.00e-03;
       swh_ocean_mle3:coordinates = "/data_01/longitude /data_01/latitude";
       swh_ocean_mle3:comment = "Named swh_ku_mle3 in GDR-D standard. All instrumental
corrections included, i.e. modeled instrumental errors correction
(swh_cor_ocean_mle3_model_instr) and system bias";
```

// Backscatter coefficient

```
short sig0_ocean(time);
       sig0_ocean:_FillValue = 32767s;
       sig0_ocean:long_name = "Ku band corrected backscatter coefficient";
       sig0_ocean:standard_name =
"surface_backwards_scattering_coefficient_of_radar_wave";
       sig0_ocean:units = "dB";
       sig0_ocean:scale_factor = 1.00e-02;
       sig0_ocean:coordinates = "/data_01/longitude /data_01/latitude";
       sig0_ocean:comment = "Named sig0_ku in GDR-D standard. All instrumental
corrections included, excepted the system bias, i.e. AGC instrumental errors correction,
internal calibration correction (sig0_cor_calibration), modeled instrumental errors
correction (sig0_cor_ocean_model_instr) and atmospheric attenuation (sig0_cor_atm)";

short sig0_ocean_mle3(time);
       sig0_ocean_mle3:_FillValue = 32767s;
       sig0_ocean_mle3:long_name = "Ku band corrected backscatter coefficient (MLE3
retracking)";
       sig0_ocean_mle3:standard_name =
"surface_backwards_scattering_coefficient_of_radar_wave";
       sig0_ocean_mle3:units = "dB";
       sig0_ocean_mle3:scale_factor = 1.00e-02;
       sig0_ocean_mle3:coordinates = "/data_01/longitude /data_01/latitude";
       sig0_ocean_mle3:comment = "Named sig0_ku_mle3 in GDR-D standard. All instrumental
corrections included, excepted the system bias, i.e. AGC instrumental errors correction,
internal calibration correction (sig0_cor_calibration), modeled instrumental errors
correction (sig0_cor_ocean_mle3_model_instr) and atmospheric attenuation (sig0_cor_atm)";
```

// Waveforms characteristics

```
byte wvf_main_class(time);
       wvf_main_class:_FillValue = 127b;
       wvf_main_class:long_name = "1 Hz Ku band waveform main class";
       wvf_main_class:flag_meanings = "brown_ocean peaky noise strong_peak
brown_peak_trailing_edge brown_peak_leading_edge brown_flat_trailing_eadge peak_end trash
brown_noise two_leading_edges shifted_brown brown_noise_leading_edge
linear_positive_slope linear_negative_slope";
       wvf_main_class:flag_values = 1b, 2b, 3b, 4b, 5b, 6b, 7b, 8b, 9b, 10b, 11b, 12b,
13b, 15b, 18b;
       wvf_main_class:coordinates = "/data_01/longitude /data_01/latitude";
       wvf_main_class:comment = "Waveform classification : main class selected by
classification neural network trained on shape features of the waveforms";
```

// Sea Surface height

```
short ssha(time);
       ssha:_FillValue = 32767s;
       ssha:long_name = "sea surface height anomaly";
       ssha:standard_name = "sea_surface_height_above_sea_level";
       ssha:source = "Poseidon-3B";
       ssha:institution = "CNES";
```

```
        ssha:units = "m";
        ssha:scale_factor = 1.00e-03;
        ssha:coordinates = "/data_01/longitude /data_01/latitude";
        ssha:comment = "= altitude of satellite (/data_01/altitude) - Ku band corrected
altimeter range (range_ocean) - filtered altimeter ionospheric correction on Ku band
(iono_cor_alt_filtered) - model dry tropospheric correction
(/data_01/model_dry_tropo_cor_zero_altitude) - radiometer wet tropospheric correction
(/data_01/rad_wet_tropo_cor) - sea state bias correction in Ku band (sea_state_bias) -
solid earth tide height (/data_01/solid_earth_tide) - geocentric ocean tide height from
FES solution (/data_01/ocean_tide_fes) - non-equilibrium long-period ocean tide height
(/data_01/ocean_tide_non_eq) - geocentric pole tide height (/data_01/pole_tide) -
internal tide (/data_01/internal_tide) - dynamic atmospheric correction (/data_01/dac) -
mean sea surface from CNES/CLS solution (/data_01/mean_sea_surface_cnescls). Set to
default if the waveform classification (wvf_main_class) is not set to 1 = brown ocean, 12
= shifted brown, 13 = brown noise leading edge or 15 = linear positive_slope, the
radiometer surface type (/data_01/rad_surface_type_flag) set to 2 = land";

short ssha_mle3(time);
        ssha_mle3:_FillValue = 32767s;
        ssha_mle3:long_name = "sea surface height anomaly (MLE3 retracking)";
        ssha_mle3:standard_name = "sea_surface_height_above_sea_level";
        ssha_mle3:source = "Poseidon-3B";
        ssha_mle3:institution = "CNES";
        ssha_mle3:units = "m";
        ssha_mle3:scale_factor = 1.00e-03;
        ssha_mle3:coordinates = "/data_01/longitude /data_01/latitude";
        ssha_mle3:comment = "= altitude of satellite (/data_01/altitude) - Ku band
corrected altimeter range (range_ocean_mle3) - filtered altimeter ionospheric correction
on Ku band (iono_cor_alt_filtered_mle3) - model dry tropospheric correction
(/data_01/model_dry_tropo_cor_zero_altitude) - radiometer wet tropospheric correction
(/data_01/rad_wet_tropo_cor) - sea state bias correction in Ku band (sea_state_bias_mle3)
- solid earth tide height (/data_01/solid_earth_tide) - geocentric ocean tide height from
FES solution (/data_01/ocean_tide_fes) - non-equilibrium long-period ocean tide height
(/data_01/ocean_tide_non_eq) - geocentric pole tide height (/data_01/pole_tide) -
internal tide (/data_01/internal_tide) - dynamic atmospheric correction (/data_01/dac) -
mean sea surface from CNES/CLS solution (/data_01/mean_sea_surface_cnescls). Set to
default if the waveform classification (wvf_main_class) is not set to 1 = brown ocean, 12
= shifted brown, 13 = brown noise leading edge or 15 = linear positive_slope, the
radiometer surface type (/data_01/rad_surface_type_flag) set to 2 = land";

} // group: ku

} // group: data_01

}
```

7. GDR DATA SET

```
netcdf gdr {
```

// 1-Hz data

```
group: data_01 {

  dimensions:
    time = < number of measurements >;

  variables:
```

// Time Tag

```
double time(time);
       time:long_name = "time in UTC";
       time:standard_name = "time";
       time:calendar = "gregorian";
       time:tai_utc_difference = < Value of TAI-UTC at time of first record >;
       time:leap_second = < UTC time of the leap second (YYYY-MM-DD hh:mm:ss) >;
       time:units = "seconds since 2000-01-01 00:00:00.0";
       time:comment = "Time of measurement in seconds in the UTC time scale since 1 Jan
2000 00:00:00 UTC. [tai_utc_difference] is the difference between TAI and UTC reference
time (seconds) for the first measurement of the data set. If a leap second occurs within
the data set, the attribute [leap_second] is set to the UTC time at which the leap second
occurs.";

double time_tai(time);
       time_tai:_FillValue = 18446744073709551616.000000;
       time_tai:long_name = "time in TAI";
       time_tai:standard_name = "time";
       time_tai:calendar = "gregorian";
       time_tai:units = "seconds since 2000-01-01 00:00:00.0";
       time_tai:comment = "Time of measurement in seconds in the TAI time scale since 1
Jan 2000 00:00:00 TAI. This time scale contains no leap seconds. The difference (in
seconds) with time in UTC is given by the attribute [time:tai_utc_difference].";

int index_first_20hz_measurement(time);
       index_first_20hz_measurement:_FillValue = 2147483647;
       index_first_20hz_measurement:long_name = "record counter of the first associated
20 Hz measurement";
       index_first_20hz_measurement:coordinates = "longitude latitude";
       index_first_20hz_measurement:comment = "Record counter of the first 20 Hz
elementary measurement used to derive the 1 Hz measurement. The total number of 20 Hz
measurements associated to 1 Hz time is given by numtotal_20hz_measurement";

byte numtotal_20hz_measurement(time);
       numtotal_20hz_measurement:_FillValue = 127b;
       numtotal_20hz_measurement:long_name = "total number of 20 Hz measurements
associated to the 1 Hz measurement";
       numtotal_20hz_measurement:coordinates = "longitude latitude";
       numtotal_20hz_measurement:comment = "Total number of 20 Hz measurements associated
to the 1 Hz measurement";
```

// Location and surface type

int latitude(time);
latitude:_FillValue = 2147483647;
latitude:long_name = "latitude";
latitude:standard_name = "latitude";
latitude:units = "degrees_north";
latitude:scale_factor = 1.00e-06;
latitude:quality_flag = "orb_state_rest_flag or orb_state_diode_flag";
latitude:comment = "Named lat in GDR-D standard. Positive latitude is North latitude, negative latitude is South latitude. See Jason-3 User Handbook. Associated quality flag is orb_state_diode_flag for the OGDR products, orb_state_rest_flag for the IGDR and GDR products";

int longitude(time);
longitude:_FillValue = 2147483647;
longitude:long_name = "longitude";
longitude:standard_name = "longitude";
longitude:units = "degrees_east";
longitude:scale_factor = 1.00e-06;
longitude:quality_flag = "orb_state_rest_flag or orb_state_diode_flag";
longitude:comment = "Named lon in GDR-D standard. East longitude relative to Greenwich meridian. See Jason-3 User Handbook. Associated quality flag is orb_state_diode_flag for the OGDR products, orb_state_rest_flag for the IGDR and GDR products";

byte rad_surface_type_flag(time);
rad_surface_type_flag:_FillValue = 127b;
rad_surface_type_flag:long_name = "radiometer surface type";
rad_surface_type_flag:flag_meanings = "open_ocean near_coast land";
rad_surface_type_flag:flag_values = 0b, 1b, 2b;
rad_surface_type_flag:coordinates = "longitude latitude";
rad_surface_type_flag:comment = "Named rad_surf_type in GDR-D standard. The radiometer surface type flag is applicable to the radiometer wet troposphere path delays provided by rad_wet_tropo_cor. A value of 0 indicates that open ocean processing is used to compute the path delay, 1 indicates coastal processing is used, and 2 indicates the path delay is invalid due to land";

int rad_distance_to_land(time);
rad_distance_to_land:_FillValue = 2147483647;
rad_distance_to_land:long_name = "radiometer radial distance to land";
rad_distance_to_land:units = "m";
rad_distance_to_land:coordinates = "longitude latitude";
rad_distance_to_land:comment = "Shortest distance between nadir sub-satellite point and land";

byte surface_classification_flag(time);
surface_classification_flag:_FillValue = 127b;
surface_classification_flag:long_name = "surface classification";
surface_classification_flag:flag_meanings = "open_ocean land continental_water aquatic_vegetation continental_ice_snow floating_ice salted_basin";
surface_classification_flag:flag_values = 0b, 1b, 2b, 3b, 4b, 5b, 6b;
surface_classification_flag:coordinates = "longitude latitude";
surface_classification_flag:comment = "Computed from a mask built with MODIS and GlobCover data";

short angle_of_approach_to_coast(time);
angle_of_approach_to_coast:_FillValue = 32767s;
angle_of_approach_to_coast:long_name = "angle of approach to the coast";
angle_of_approach_to_coast:units = "degrees";
angle_of_approach_to_coast:scale_factor = 1.00e-02;
angle_of_approach_to_coast:coordinates = "longitude latitude";
angle_of_approach_to_coast:comment = "Angle of approach to the closest coast. 0 is parallel to the coast with the land on the right. Positive values indicate the satellite

```
is approaching the land. Negative values indicate the satellite is leaving the land.
Values close to +/-180 degrees have the land on the left";

int distance_to_coast(time);
       distance_to_coast:_FillValue = 2147483647;
       distance_to_coast:long_name = "distance to the coast";
       distance_to_coast:units = "m";
       distance_to_coast:coordinates = "longitude latitude";
```

// Quality information and sensor status

// Quality flags for 1 Hz radiometer data

```
byte rad_tb_187_qual(time);
       rad_tb_187_qual:_FillValue = 127b;
       rad_tb_187_qual:long_name = "quality flag for 1 Hz radiometer data: 18.7 GHz
brightness temperature";
       rad_tb_187_qual:flag_meanings = "good bad";
       rad_tb_187_qual:flag_values = 0b, 1b;
       rad_tb_187_qual:coordinates = "longitude latitude";
       rad_tb_187_qual:comment = "Named qual_rad_1hz_tb187 in GDR-D standard";

byte rad_tb_238_qual(time);
       rad_tb_238_qual:_FillValue = 127b;
       rad_tb_238_qual:long_name = "quality flag for 1 Hz radiometer data: 23.8 GHz
brightness temperature";
       rad_tb_238_qual:flag_meanings = "good bad";
       rad_tb_238_qual:flag_values = 0b, 1b;
       rad_tb_238_qual:coordinates = "longitude latitude";
       rad_tb_238_qual:comment = "Named qual_rad_1hz_tb238 in GDR-D standard";

byte rad_tb_340_qual(time);
       rad_tb_340_qual:_FillValue = 127b;
       rad_tb_340_qual:long_name = "quality flag for 1 Hz radiometer data: 34 GHz
brightness temperature";
       rad_tb_340_qual:flag_meanings = "good bad";
       rad_tb_340_qual:flag_values = 0b, 1b;
       rad_tb_340_qual:coordinates = "longitude latitude";
       rad_tb_340_qual:comment = "Named qual_rad_1hz_tb340 in GDR-D standard";

byte rad_averaging_flag(time);
       rad_averaging_flag:_FillValue = 127b;
       rad_averaging_flag:long_name = "radiometer along-track averaging flag";
       rad_averaging_flag:flag_meanings = "good bad";
       rad_averaging_flag:flag_values = 0b, 1b;
       rad_averaging_flag:coordinates = "longitude latitude";

short rad_land_frac_187(time);
       rad_land_frac_187:_FillValue = 32767s;
       rad_land_frac_187:long_name = "radiometer 18.7 GHz antenna gain weighted land
fraction in main beam";
       rad_land_frac_187:units = "1";
       rad_land_frac_187:scale_factor = 1.00e-02;
       rad_land_frac_187:coordinates = "longitude latitude";
       rad_land_frac_187:comment = "ratio between 0 and 1";

short rad_land_frac_238(time);
       rad_land_frac_238:_FillValue = 32767s;
       rad_land_frac_238:long_name = "radiometer 23.8 GHz antenna gain weighted land
fraction in main beam";
       rad_land_frac_238:units = "1";
       rad_land_frac_238:scale_factor = 1.00e-02;
```

```
      rad_land_frac_238:coordinates = "longitude latitude";
      rad_land_frac_238:comment = "ratio between 0 and 1";

short rad_land_frac_340(time);
      rad_land_frac_340:_FillValue = 32767s;
      rad_land_frac_340:long_name = "radiometer 34 GHz antenna gain weighted land
fraction in main beam";
      rad_land_frac_340:units = "1";
      rad_land_frac_340:scale_factor = 1.00e-02;
      rad_land_frac_340:coordinates = "longitude latitude";
      rad_land_frac_340:comment = "ratio between 0 and 1";

      // Altimeter state flags

byte alt_state_oper_flag(time);
      alt_state_oper_flag:_FillValue = 127b;
      alt_state_oper_flag:long_name = "altimeter state flag: altimeter operating";
      alt_state_oper_flag:flag_meanings = "SideA SideB";
      alt_state_oper_flag:flag_values = 0b, 1b;
      alt_state_oper_flag:coordinates = "longitude latitude";
      alt_state_oper_flag:comment = "Named alt_state_flag_oper in GDR-D standard. Side A
= nominal; Side B = redondancy";

byte alt_state_band_seq_flag(time);
      alt_state_band_seq_flag:_FillValue = 127b;
      alt_state_band_seq_flag:long_name = "altimeter state flag: Ku/C band sequencing";
      alt_state_band_seq_flag:flag_meanings = "3Ku_1C_3Ku 2Ku_1C_2Ku";
      alt_state_band_seq_flag:flag_values = 0b, 1b;
      alt_state_band_seq_flag:coordinates = "longitude latitude";
      alt_state_band_seq_flag:comment = "Named alt_state_flag_band_seq in GDR-D
standard";

      // Radiometer state flag

byte rad_state_oper_flag(time);
      rad_state_oper_flag:_FillValue = 127b;
      rad_state_oper_flag:long_name = "radiometer state flag: radiometer operating";
      rad_state_oper_flag:flag_meanings = "SideA SideB";
      rad_state_oper_flag:flag_values = 0b, 1b;
      rad_state_oper_flag:coordinates = "longitude latitude";
      rad_state_oper_flag:comment = "Named rad_state_flag_oper in GDR-D standard. Side A
= nominal; Side B = redondancy";

      // Orbit state flags

byte orb_state_diode_flag(time);
      orb_state_diode_flag:_FillValue = 127b;
      orb_state_diode_flag:long_name = "orbit state flag: OGDR products";
      orb_state_diode_flag:flag_meanings = "From good quality (0) to bad quality (9)";
      orb_state_diode_flag:flag_values = 0b, 1b, 2b, 3b, 4b, 5b, 6b, 7b, 8b, 9b;
      orb_state_diode_flag:coordinates = "longitude latitude";
      orb_state_diode_flag:comment = "Named orb_state_flag_diode in GDR-D standard. 0 =
Accurate orbit (0 - 5 cm radial), 1 = Good orbit (5 - 10 cm radial), 2 = Moderate orbit
(10 - 15 cm radial), 4-8 = Potentially degraded orbit (> 15 cm radial), 9 = Degraded
orbit (e.g., as during maneuver)";

byte orb_state_rest_flag(time);
      orb_state_rest_flag:_FillValue = 127b;
      orb_state_rest_flag:long_name = "orbit state flag: restituted orbit";
```

```
      orb_state_rest_flag:flag_meanings = "op_maneuver op_adjusted op_extrapolated
pre_adjusted pre_maneuver pre_interpolated_gap pre_extrapolated_L1 pre_extrapolated_L1S2
pre_extrapolated_S2 DIODE";
      orb_state_rest_flag:flag_values = 0b, 1b, 2b, 3b, 4b, 5b, 6b, 7b, 8b, 9b;
      orb_state_rest_flag:coordinates = "longitude latitude";
      orb_state_rest_flag:comment = "Named orb_state_flag_rest in GDR-D standard. 0
characterizes a mission operations orbit that is computed during a maneuver period, 1
stands for an adjusted mission operations orbit, 2 stands for an extrapolated mission
operations orbit, 3 stands for an adjusted (preliminary/precise) orbit, 4 indicates that
the (preliminary/precise) orbit is estimated during a maneuver period, 5 indicates that
the (preliminary/precise) orbit is interpolated over a tracking data gap, 6 means that
the (preliminary/precise) orbit is extrapolated for a duration less than 1 day, 7 means
that the (preliminary/precise) orbit is extrapolated for a duration that ranges from 1
day to 2 days, 8 means that the (preliminary/precise) orbit is extrapolated for a
duration larger than 2 days, or that the orbit is extrapolated just after a maneuver, 9
stands for the DORIS DIODE navigator orbit. The nominal value is 3";

      // Geophysical flags

byte meteo_map_availability_flag(time);
      meteo_map_availability_flag:_FillValue = 127b;
      meteo_map_availability_flag:long_name = "ECMWF meteorological map availability";
      meteo_map_availability_flag:flag_meanings = "2_maps_nominal 2_maps_degraded
1_map_closest_used no_valid_map";
      meteo_map_availability_flag:flag_values = 0b, 1b, 2b, 3b;
      meteo_map_availability_flag:coordinates = "longitude latitude";
      meteo_map_availability_flag:comment = "Named ecmwf_meteo_map_avail in GDR-D
standard. Possible values are: 0 meaning '2 maps, nominal' (six hours apart), 1 meaning
'2 maps, degraded' (more than six hours apart), 2 meaning '1 map, closest map used', 3
meaning ''no valid map''";

byte wave_model_map_availability_flag(time);
      wave_model_map_availability_flag:_FillValue = 127b;
      wave_model_map_availability_flag:long_name = "wave model map availability";
      wave_model_map_availability_flag:flag_meanings = "2_maps_nominal 2_maps_degraded
1_map_closest_used no_valid_map";
      wave_model_map_availability_flag:flag_values = 0b, 1b, 2b, 3b;
      wave_model_map_availability_flag:coordinates = "longitude latitude";
      wave_model_map_availability_flag:comment = "Possible values are: 0 meaning '2
maps, nominal' (three hours apart), 1 meaning '2 maps, degraded' (more than three hours
apart), 2 meaning '1 map, closest map used', 3 meaning ''no valid map''";

byte sig0_cor_atm_source (time);
      sig0_cor_atm_source:_FillValue = 127b;
      sig0_cor_atm_source:long_name = "data source for atmospheric attenuation
computation";
      sig0_cor_atm_source:flag_meanings = "radiometer meteo_model";
      sig0_cor_atm_source:flag_values = 0b, 1b;
      sig0_cor_atm_source:coordinates = "longitude latitude";
      sig0_cor_atm_source:comment = "Flag indicating whether the radiometer data or the
climatological values from meteorological model (ECMWF backup solution) have been used to
compute the atmospheric sigma0 correction.";

byte rain_flag(time);
      rain_flag:_FillValue = 127b;
      rain_flag:long_name = "rain flag";
      rain_flag:flag_meanings = "no_rain rain high_rain_probability_from_altimeter
high_probability_of_no_rain_from_altimeter ambiguous_situation_possibility_of_ice
evaluation_not_possible";
      rain_flag:flag_values = 0b, 1b, 2b, 3b, 4b, 5b;
      rain_flag:coordinates = "longitude latitude";
```

```
      rain_flag:comment = "See Jason-3 User Handbook . A bias of -0.231 dB (Ku Band) / -
0.012 dB (C Band) has been added to the backscatter coefficient
(/data_01/ku/sig0_ocean_mle3 / /data_01/c/sig0_ocean) before computing the rain flag";

byte rad_rain_flag(time);
      rad_rain_flag:_FillValue = 127b;
      rad_rain_flag:long_name = "radiometer rain flag";
      rad_rain_flag:flag_meanings = "no_rain rain";
      rad_rain_flag:flag_values = 0b, 1b;
      rad_rain_flag:coordinates = "longitude latitude";
      rad_rain_flag:comment = "See Jason-3 User Handbook. The radiometer rain flag
indicates where the radiometer wet troposphere path delay (rad_wet_tropo_cor) is invalid
due to rain contamination";

byte ice_flag(time);
      ice_flag:_FillValue = 127b;
      ice_flag:long_name = "ice flag";
      ice_flag:flag_meanings = "no_ice ice";
      ice_flag:flag_values = 0b, 1b;
      ice_flag:coordinates = "longitude latitude";
      ice_flag:comment = "See Jason-3 User Handbook";

byte rad_sea_ice_flag(time);
      rad_sea_ice_flag:_FillValue = 127b;
      rad_sea_ice_flag:long_name = "radiometer sea-ice flag";
      rad_sea_ice_flag:flag_meanings = "no_sea_ice sea_ice";
      rad_sea_ice_flag:flag_values = 0b, 1b;
      rad_sea_ice_flag:coordinates = "longitude latitude";
      rad_sea_ice_flag:comment = "See Jason-3 User Handbook. The radiometer sea ice flag
indicates where the radiometer wet troposphere path delay (rad_wet_tropo_cor) is invalid
due to sea ice contamination";

      // Quality flags for interpolation

byte rad_tb_interp_qual(time);
      rad_tb_interp_qual:_FillValue = 127b;
      rad_tb_interp_qual:long_name = "radiometer brightness temperatures interpolation
flag";
      rad_tb_interp_qual:flag_meanings = "good interpolation_with_gap extrapolation
fail";
      rad_tb_interp_qual:flag_values = 0b, 1b, 2b, 3b;
      rad_tb_interp_qual:coordinates = "longitude latitude";
      rad_tb_interp_qual:comment = "Named interp_flag_tb in GDR-D standard. Possible
values are: 0 = interpolation without gap between AMR data, 1 = interpolation with gap
between AMR data, 2 = extrapolation of AMR data, 3 = failure of extrapolation and
interpolation";

byte mean_sea_surface_cnescls_interp_qual(time);
      mean_sea_surface_cnescls_interp_qual:_FillValue = 127b;
      mean_sea_surface_cnescls_interp_qual:long_name = "mean_ sea_ surface interpolation
flag (CNES/CLS solution)";
      mean_sea_surface_cnescls_interp_qual:flag_meanings = "good bad";
      mean_sea_surface_cnescls_interp_qual:flag_values = 0b, 1b;
      mean_sea_surface_cnescls_interp_qual:coordinates = "longitude latitude";
      mean_sea_surface_cnescls_interp_qual:comment = "Named
interp_flag_mean_sea_surface_sol1 in GDR-D standard";

byte mean_sea_surface_dtu_interp_qual(time);
      mean_sea_surface_dtu_interp_qual:_FillValue = 127b;
      mean_sea_surface_dtu_interp_qual:long_name = "mean_ sea_ surface interpolation
flag (DTU solution)";
      mean_sea_surface_dtu_interp_qual:flag_meanings = "good bad";
      mean_sea_surface_dtu_interp_qual:flag_values = 0b, 1b;
```

```
      mean_sea_surface_dtu_interp_qual:coordinates = "longitude latitude";
      mean_sea_surface_dtu_interp_qual:comment = "Named
interp_flag_mean_sea_surface_sol2 in GDR-D standard";

byte mean_dynamic_topography_interp_qual(time);
      mean_dynamic_topography_interp_qual:_FillValue = 127b;
      mean_dynamic_topography_interp_qual:long_name = "MDT interpolation flag";
      mean_dynamic_topography_interp_qual:flag_meanings = "good bad";
      mean_dynamic_topography_interp_qual:flag_values = 0b, 1b;
      mean_dynamic_topography_interp_qual:coordinates = "longitude latitude";
      mean_dynamic_topography_interp_qual:comment = "Named interp_flag_mdt in GDR-D
standard";

byte ocean_tide_got_interp_qual(time);
      ocean_tide_got_interp_qual:_FillValue = 127b;
      ocean_tide_got_interp_qual:long_name = "ocean tide interpolation flag (GOT
solution)";
      ocean_tide_got_interp_qual:flag_meanings = "good bad extrapolation";
      ocean_tide_got_interp_qual:flag_values = 0b, 1b, 2b;
      ocean_tide_got_interp_qual:coordinates = "longitude latitude";
      ocean_tide_got_interp_qual:comment = "Named interp_flag_ocean_tide_sol1 in GDR-D
standard. 0 = 4 points over ocean; 1 = less than 4 points; 2 = extrapolated points";

byte ocean_tide_fes_interp_qual(time);
      ocean_tide_fes_interp_qual:_FillValue = 127b;
      ocean_tide_fes_interp_qual:long_name = "ocean tide interpolation flag (FES
solution)";
      ocean_tide_fes_interp_qual:flag_meanings = "good bad extrapolation";
      ocean_tide_fes_interp_qual:flag_values = 0b, 1b, 2b;
      ocean_tide_fes_interp_qual:coordinates = "longitude latitude";
      ocean_tide_fes_interp_qual:comment = "Named interp_flag_ocean_tide_sol2 in GDR-D
standard. 0 = 4 points over ocean; 1 = less than 4 points; 2 = extrapolated points";

byte internal_tide_interp_qual(time);
      internal_tide_interp_qual:_FillValue = 127b;
      internal_tide_interp_qual:long_name = "internal tide interpolation flag";
      internal_tide_interp_qual:flag_meanings = "good bad";
      internal_tide_interp_qual:flag_values = 0b, 1b;
      internal_tide_interp_qual:coordinates = "longitude latitude";
      internal_tide_interp_qual:comment = "Named interp_flag_internal_tide in GDR-D
standard. 0 = 4 points over ocean; 1 = less than 4 points";

byte meteo_zero_altitude_interp_qual(time);
      meteo_zero_altitude_interp_qual:_FillValue = 127b;
      meteo_zero_altitude_interp_qual:long_name = "meteorological data at zero altitude
interpolation flag";
      meteo_zero_altitude_interp_qual:flag_meanings = "good bad";
      meteo_zero_altitude_interp_qual:flag_values = 0b, 1b;
      meteo_zero_altitude_interp_qual:coordinates = "longitude latitude";
      meteo_zero_altitude_interp_qual:comment = "Named interp_flag_meteo in GDR-D
standard. 0 = interpolation from 4 points; 1 = interpolation from less than 4 points";

byte meteo_measurement_altitude_interp_qual(time);
      meteo_measurement_altitude_interp_qual:_FillValue = 127b;
      meteo_measurement_altitude_interp_qual:long_name = "meteorological data at
measurement altitude interpolation flag";
      meteo_measurement_altitude_interp_qual:flag_meanings = "good bad";
      meteo_measurement_altitude_interp_qual:flag_values = 0b, 1b;
      meteo_measurement_altitude_interp_qual:coordinates = "longitude latitude";
      meteo_measurement_altitude_interp_qual:comment = "0 = interpolation from 4 points;
1 = interpolation from less than 4 points";

byte sea_ice_concentration_interp_qual(time);
      sea_ice_concentration_interp_qual:_FillValue = 127b;
```

```
       sea_ice_concentration_interp_qual:long_name = "sea ice concentration data
interpolation flag";
       sea_ice_concentration_interp_qual:flag_meanings = "good bad";
       sea_ice_concentration_interp_qual:flag_values = 0b, 1b;
       sea_ice_concentration_interp_qual:coordinates = "longitude latitude";
       sea_ice_concentration_interp_qual:comment = "0 = interpolation from 4 points; 1 =
interpolation from less than 4 points";

byte wave_model_interp_qual(time);
       wave_model_interp_qual:_FillValue = 127b;
       wave_model_interp_qual:long_name = "wave model data interpolation flag";
       wave_model_interp_qual:flag_meanings = "good bad";
       wave_model_interp_qual:flag_values = 0b, 1b;
       wave_model_interp_qual:coordinates = "longitude latitude";
       wave_model_interp_qual:comment = "0 = interpolation from 4 points; 1 =
interpolation from less than 4 points";
```

// Orbit

```
int altitude(time);
       altitude:_FillValue = 2147483647;
       altitude:long_name = "1 Hz altitude of satellite";
       altitude:standard_name = "height_above_reference_ellipsoid";
       altitude:units = "m";
       altitude:add_offset = 1.300000e+06;
       altitude:scale_factor = 1.00e-04;
       altitude:coordinates = "longitude latitude";
       altitude:quality_flag = "orb_state_rest_flag or orb_state_diode_flag";
       altitude:comment = "Named alt in GDR-D standard. Altitude of satellite above the
reference ellipsoid. Associated quality flag is orb_state_diode_flag for the OGDR
products, orb_state_rest_flag for the IGDR and GDR products";

short altitude_rate(time);
       altitude_rate:_FillValue = 32767s;
       altitude_rate:long_name = "1 Hz orbital altitude rate";
       altitude_rate:units = "m/s";
       altitude_rate:scale_factor = 1.00e-02;
       altitude_rate:coordinates = "longitude latitude";
       altitude_rate:comment = "Named orb_alt_rate in GDR-D standard. The reference
surface for the orbital altitude rate is the combined mean_sea_surface_cnescls/geoid
surface. It is used to compute the Doppler correction on the altimeter range
(/data_01/ku/range_cor_doppler, /data_01/c/range_cor_doppler)";
```

// Altimeter range corrections

```
short model_dry_tropo_cor_zero_altitude(time);
       model_dry_tropo_cor_zero_altitude:_FillValue = 32767s;
       model_dry_tropo_cor_zero_altitude:long_name = "model dry tropospheric correction
at zero altitude";
       model_dry_tropo_cor_zero_altitude:standard_name =
"altimeter_range_correction_due_to_dry_troposphere";
       model_dry_tropo_cor_zero_altitude:source = "European Center for Medium Range
Weather Forecasting";
       model_dry_tropo_cor_zero_altitude:institution = "ECMWF";
       model_dry_tropo_cor_zero_altitude:units = "m";
       model_dry_tropo_cor_zero_altitude:scale_factor = 1.00e-04;
       model_dry_tropo_cor_zero_altitude:coordinates = "longitude latitude";
       model_dry_tropo_cor_zero_altitude:quality_flag =
"meteo_zero_altitude_interp_qual";
       model_dry_tropo_cor_zero_altitude:comment = "Named model_dry_tropo_corr in GDR-D
standard. Computed at the altimeter time-tag from the interpolation of 2 meteorological
```

fields that surround the altimeter time-tag. A dry tropospheric correction must be added (negative value) to the instrument range to correct this range measurement for dry tropospheric range delays of the radar pulse. See Jason-3 User Handbook";

short model_dry_tropo_cor_measurement_altitude(time);
model_dry_tropo_cor_measurement_altitude:_FillValue = 32767s;
model_dry_tropo_cor_measurement_altitude:institution = "ECMWF";
model_dry_tropo_cor_measurement_altitude:long_name = "model dry tropospheric correction at measurement altitude";
model_dry_tropo_cor_measurement_altitude:standard_name = "altimeter_range_correction_due_to_dry_troposphere";
model_dry_tropo_cor_measurement_altitude:source = "European Center for Medium Range Weather Forecasting";
model_dry_tropo_cor_measurement_altitude:institution = "ECMWF";
model_dry_tropo_cor_measurement_altitude:units = "m";
model_dry_tropo_cor_measurement_altitude:scale_factor = 1.00e-04;
model_dry_tropo_cor_measurement_altitude:coordinates = "longitude latitude";
model_dry_tropo_cor_measurement_altitude:quality_flag = "meteo_measurement_altitude_interp_qual";
model_dry_tropo_cor_measurement_altitude:comment = "Computed from 3d meteorological fields at measurement altitude, at the altimeter time-tag from the interpolation of 2 meteorological fields that surround the altimeter time-tag. A dry tropospheric correction must be added (negative value) to the instrument range to correct this range measurement for dry tropospheric range delays of the radar pulse. See Jason-3 User Handbook";

short model_wet_tropo_cor_zero_altitude(time);
model_wet_tropo_cor_zero_altitude:_FillValue = 32767s;
model_wet_tropo_cor_zero_altitude:long_name = "model wet tropospheric correction at zero altitude";
model_wet_tropo_cor_zero_altitude:standard_name = "altimeter_range_correction_due_to_wet_troposphere";
model_wet_tropo_cor_zero_altitude:source = "European Center for Medium Range Weather Forecasting";
model_wet_tropo_cor_zero_altitude:institution = "ECMWF";
model_wet_tropo_cor_zero_altitude:units = "m";
model_wet_tropo_cor_zero_altitude:scale_factor = 1.00e-04;
model_wet_tropo_cor_zero_altitude:coordinates = "longitude latitude";
model_wet_tropo_cor_zero_altitude:quality_flag = "meteo_zero_altitude_interp_qual";
model_wet_tropo_cor_zero_altitude:comment = "Named model_wet_tropo_corr in GDR-D standard. Computed at the altimeter time-tag from the interpolation of 2 meteorological fields that surround the altimeter time-tag. A wet tropospheric correction must be added (negative value) to the instrument range to correct this range measurement for wet tropospheric range delays of the radar pulse. See Jason-3 User Handbook";

short model_wet_tropo_cor_measurement_altitude(time);
model_wet_tropo_cor_measurement_altitude:_FillValue = 32767s;
model_wet_tropo_cor_measurement_altitude:long_name = "model wet tropospheric correction at measurement altitude";
model_wet_tropo_cor_measurement_altitude:standard_name = "altimeter_range_correction_due_to_wet_troposphere";
model_wet_tropo_cor_measurement_altitude:source = "European Center for Medium Range Weather Forecasting";
model_wet_tropo_cor_measurement_altitude:institution = "ECMWF";
model_wet_tropo_cor_measurement_altitude:units = "m";
model_wet_tropo_cor_measurement_altitude:scale_factor = 1.00e-04;
model_wet_tropo_cor_measurement_altitude:coordinates = "longitude latitude";
model_wet_tropo_cor_measurement_altitude:quality_flag = "meteo_measurement_altitude_interp_qual";
model_wet_tropo_cor_measurement_altitude:comment = "Computed from 3d meteorological fields at measurement altitude, at the altimeter time-tag from the interpolation of 2 meteorological fields that surround the altimeter time-tag. A wet tropospheric correction must be added (negative value) to the instrument range to correct

this range measurement for wet tropospheric range delays of the radar pulse. See Jason-3 User Handbook";

short rad_wet_tropo_cor(time);
rad_wet_tropo_cor:_FillValue = 32767s;
rad_wet_tropo_cor:long_name = "radiometer wet tropospheric correction";
rad_wet_tropo_cor:standard_name = "altimeter_range_correction_due_to_wet_troposphere";
rad_wet_tropo_cor:source = "AMR";
rad_wet_tropo_cor:institution = "NASA/JPL";
rad_wet_tropo_cor:units = "m";
rad_wet_tropo_cor:scale_factor = 1.00e-04;
rad_wet_tropo_cor:coordinates = "longitude latitude";
rad_wet_tropo_cor:quality_flag = "rad_tb_187_qual and rad_tb_238_qual and rad_tb_340_qual and rad_tb_interp_qual";
rad_wet_tropo_cor:comment = "Named rad_wet_tropo_corr in GDR-D standard. A wet tropospheric correction must be added (negative value) to the instrument range to correct this range measurement for wet tropospheric range delays of the radar pulse";

int surface_slope_cor(time);
surface_slope_cor:_FillValue = 2147483647;
surface_slope_cor:long_name = "surface slope correction";
surface_slope_cor:source = < surface_slope_cor_source >;
surface_slope_cor:units = "m";
surface_slope_cor:scale_factor = 1.00e-04;
surface_slope_cor:coordinates = "longitude latitude";
surface_slope_cor:comment = "The surface slope correction shall not be used with the mean sea surface (mean_sea_surface_cnescls or mean_sea_surface_dtu) provided in the product. See Jason-3 User Handbook";

// Brightness temperatures

short rad_tmb_187(time);
rad_tmb_187:_FillValue = 32767s;
rad_tmb_187:long_name = "18.7 GHz main beam brightness temperature";
rad_tmb_187:standard_name = "surface_brightness_temperature";
rad_tmb_187:units = "K";
rad_tmb_187:scale_factor = 1.00e-02;
rad_tmb_187:coordinates = "longitude latitude";
rad_tmb_187:quality_flag = "rad_tb_187_qual";
rad_tmb_187:comment = "Named tb_187 in GDR-D standard. Brightness temperatures are unsmoothed (along-track averaging has not been performed on the brightness temperatures)";

short rad_tmb_238(time);
rad_tmb_238:_FillValue = 32767s;
rad_tmb_238:long_name = "23.8 GHz main beam brightness temperature";
rad_tmb_238:standard_name = "surface_brightness_temperature";
rad_tmb_238:units = "K";
rad_tmb_238:scale_factor = 1.00e-02;
rad_tmb_238:coordinates = "longitude latitude";
rad_tmb_238:quality_flag = "rad_tb_238_qual";
rad_tmb_238:comment = "Named tb_238 in GDR-D standard. Brightness temperatures are unsmoothed (along-track averaging has not been performed on the brightness temperatures)";

short rad_tmb_340(time);
rad_tmb_340:_FillValue = 32767s;
rad_tmb_340:long_name = "34 GHz main beam brightness temperature";
rad_tmb_340:standard_name = "surface_brightness_temperature";
rad_tmb_340:units = "K";
rad_tmb_340:scale_factor = 1.00e-02;
rad_tmb_340:coordinates = "longitude latitude";

```
      rad_tmb_340:quality_flag = "rad_tb_340_qual";
      rad_tmb_340:comment = "Named tb_340 in GDR-D standard. Brightness temperatures are
unsmoothed (along-track averaging has not been performed on the brightness
temperatures)";

short rad_tb_187(time);
      rad_tb_187:_FillValue = 32767s;
      rad_tb_187:long_name = "18.7 GHz main beam smoothed brightness temperature";
      rad_tb_187:standard_name = "surface_brightness_temperature";
      rad_tb_187:units = "K";
      rad_tb_187:scale_factor = 1.00e-02;
      rad_tb_187:coordinates = "longitude latitude";
      rad_tb_187:quality_flag = "rad_tb_187_qual";
      rad_tb_187:comment = "Named tb_187_smoothed in GDR-D standard. Brightness
temperatures are along-track averaged";

short rad_tb_238(time);
      rad_tb_238:_FillValue = 32767s;
      rad_tb_238:long_name = "23.8 GHz main beam smoothed brightness temperature";
      rad_tb_238:standard_name = "surface_brightness_temperature";
      rad_tb_238:units = "K";
      rad_tb_238:scale_factor = 1.00e-02;
      rad_tb_238:coordinates = "longitude latitude";
      rad_tb_238:quality_flag = "rad_tb_238_qual";
      rad_tb_238:comment = "Named tb_238_smoothed in GDR-D standard. Brightness
temperatures are along-track averaged";

short rad_tb_340(time);
      rad_tb_340:_FillValue = 32767s;
      rad_tb_340:long_name = "34 GHz main beam smoothed brightness temperature";
      rad_tb_340:standard_name = "surface_brightness_temperature";
      rad_tb_340:units = "K";
      rad_tb_340:scale_factor = 1.00e-02;
      rad_tb_340:coordinates = "longitude latitude";
      rad_tb_340:quality_flag = "rad_tb_340_qual";
      rad_tb_340:comment = "Named tb_340_smoothed in GDR-D standard. Brightness
temperatures are along-track averaged";
```

// Geophysical parameters

```
int mean_sea_surface_cnescls(time);
      mean_sea_surface_cnescls:_FillValue = 2147483647;
      mean_sea_surface_cnescls:long_name = "mean sea surface height (CNES/CLS solution)
above reference ellipsoid";
      mean_sea_surface_cnescls:source = < mean_sea_surface_cnescls_source >;
      mean_sea_surface_cnescls:institution = < mean_sea_surface_cnescls_institution >;
      mean_sea_surface_cnescls:units = "m";
      mean_sea_surface_cnescls:scale_factor = 1.00e-04;
      mean_sea_surface_cnescls:coordinates = "longitude latitude";
      mean_sea_surface_cnescls:quality_flag = "mean_sea_surface_cnescls_interp_qual";
      mean_sea_surface_cnescls:comment = "Named mean_sea_surface_sol1 in GDR-D standard.
See Jason-3 User Handbook";

int mean_sea_surface_dtu(time);
      mean_sea_surface_dtu:_FillValue = 2147483647;
      mean_sea_surface_dtu:long_name = "mean sea surface height (DTU solution) above
reference ellipsoid";
      mean_sea_surface_dtu:source = < mean_sea_surface_dtu_source >;
      mean_sea_surface_dtu:institution = < mean_sea_surface_dtu_institution >;
      mean_sea_surface_dtu:units = "m";
      mean_sea_surface_dtu:scale_factor = 1.00e-04;
      mean_sea_surface_dtu:coordinates = "longitude latitude";
      mean_sea_surface_dtu:quality_flag = "mean_sea_surface_dtu_interp_qual";
```

```
      mean_sea_surface_dtu:comment = "Named mean_sea_surface_sol2 in GDR-D standard. See
Jason-3 User Handbook";

int mean_dynamic_topography(time);
      mean_dynamic_topography:_FillValue = 2147483647;
      mean_dynamic_topography:long_name = "mean dynamic topography above geoid";
      mean_dynamic_topography:source = < mdt_source >;
      mean_dynamic_topography:institution = < mdt_institution >;
      mean_dynamic_topography:units = "m";
      mean_dynamic_topography:scale_factor = 1.00e-04;
      mean_dynamic_topography:coordinates = "longitude latitude";
      mean_dynamic_topography:quality_flag = "mean_dynamic_topography_interp_qual";
      mean_dynamic_topography:comment = "Named mean_topography in GDR-D standard. See
Jason-3 User Handbook";

int geoid(time);
      geoid:_FillValue = 2147483647;
      geoid:long_name = "geoid height";
      geoid:standard_name = "geoid_height_above_reference_ellipsoid";
      geoid:source = < geoid_source >;
      geoid:institution = < geoid_institution >;
      geoid:units = "m";
      geoid:scale_factor = 1.00e-04;
      geoid:coordinates = "longitude latitude";
      geoid:comment = "Computed from the geoid model with a correction to refer the
value to the mean tide system i.e. includes the permanent tide (zero frequency). See
Jason-3 User Handbook";

int depth_or_elevation(time);
      depth_or_elevation:_FillValue = 2147483647;
      depth_or_elevation:long_name = "ocean depth/land elevation";
      depth_or_elevation:source = < bathy_topo_source >;
      depth_or_elevation:institution = < bathy_topo_institution >;
      depth_or_elevation:units = "m";
      depth_or_elevation:coordinates = "longitude latitude";
      depth_or_elevation:comment = "Named bathymetry in GDR-D standard";

short inv_bar_cor(time);
      inv_bar_cor:_FillValue = 32767s;
      inv_bar_cor:long_name = "inverted barometer height correction";
      inv_bar_cor:standard_name =
"sea_surface_height_correction_due_to_air_pressure_at_low_frequency";
      inv_bar_cor:source = "European Center for Medium Range Weather Forecasting";
      inv_bar_cor:institution = "ECMWF";
      inv_bar_cor:units = "m";
      inv_bar_cor:scale_factor = 1.00e-04;
      inv_bar_cor:coordinates = "longitude latitude";
      inv_bar_cor:quality_flag = "meteo_zero_altitude_interp_qual";
      inv_bar_cor:comment = "Named inv_bar_corr in GDR-D standard. Computed at the
altimeter time-tag from the interpolation of 2 meteorological fields that surround the
altimeter time-tag. See Jason-3 User Handbook";

short dac(time);
      dac:_FillValue = 32767s;
      dac:long_name = "dynamic atmospheric correction";
      dac:institution = "LEGOS/CLS/CNES";
      dac:units = "m";
      dac:scale_factor = 1.00e-04;
      dac:coordinates = "longitude latitude";
      dac:comment = "Sum of the high frequency fluctuations correction (named
hf_fluctuations_corr in GDR-D standard) and of the low frequency inverted barometer
correction (inv_bar_cor). See Jason-3 User Handbook";

int ocean_tide_got(time);
```

ocean_tide_got:_FillValue = 2147483647;
ocean_tide_got:long_name = "geocentric ocean tide height (GOT solution)";
ocean_tide_got:standard_name =
"sea_surface_height_amplitude_due_to_geocentric_ocean_tide";
ocean_tide_got:source = < ocean_tide_got_source >;
ocean_tide_got:institution = < ocean_tide_got_institution >;
ocean_tide_got:units = "m";
ocean_tide_got:scale_factor = 1.00e-04;
ocean_tide_got:coordinates = "longitude latitude";
ocean_tide_got:quality_flag = "ocean_tide_got_interp_qual";
ocean_tide_got:comment = "Named ocean_tide_sol1 in GDR-D standard. Includes the corresponding loading tide (load_tide_got) and equilibrium long-period ocean tide height (ocean_tide_eq). The permanent tide (zero frequency) is not included in this parameter because it is included in the geoid and mean sea surface (geoid, mean_sea_surface_cnescls). See Jason-3 User Handbook";

int ocean_tide_fes(time);
ocean_tide_fes:_FillValue = 2147483647;
ocean_tide_fes:long_name = "geocentric ocean tide height (FES solution)";
ocean_tide_fes:standard_name =
"sea_surface_height_amplitude_due_to_geocentric_ocean_tide";
ocean_tide_fes:source = < ocean_tide_fes_source >;
ocean_tide_fes:institution = < ocean_tide_fes_institution >;
ocean_tide_fes:units = "m";
ocean_tide_fes:scale_factor = 1.00e-04;
ocean_tide_fes:coordinates = "longitude latitude";
ocean_tide_fes:quality_flag = "ocean_tide_fes_interp_qual";
ocean_tide_fes:comment = "Named ocean_tide_sol2 in GDR-D standard. Includes the equilibrium long-period ocean tide height (ocean_tide_equil) and the short-period part of the corresponding loading tide (load_tide_fes). The permanent tide (zero frequency) is not included in this parameter because it is included in the geoid and mean sea surface (geoid, mean_sea_surface_cnescls). See Jason-3 User Handbook";

short ocean_tide_eq(time);
ocean_tide_eq:_FillValue = 32767s;
ocean_tide_eq:long_name = "equilibrium long-period ocean tide height";
ocean_tide_eq:standard_name =
"sea_surface_height_amplitude_due_to_equilibrium_ocean_tide";
ocean_tide_eq:source = < ocean_tide_eq_source >;
ocean_tide_eq:units = "m";
ocean_tide_eq:scale_factor = 1.00e-04;
ocean_tide_eq:coordinates = "longitude latitude";
ocean_tide_eq:comment = "Named ocean_tide_equil in GDR-D standard. This value has already been added to the two geocentric ocean tide height values recorded in the product (ocean_tide_got and ocean_tide_fes). The permanent tide (zero frequency) is not included in this parameter because it is included in the geoid and mean sea surface (geoid, mean_sea_surface_cnescls). See Jason-3 User Handbook";

short ocean_tide_non_eq(time);
ocean_tide_non_eq:_FillValue = 32767s;
ocean_tide_non_eq:long_name = "non-equilibrium long-period ocean tide height";
ocean_tide_non_eq:standard_name =
"sea_surface_height_amplitude_due_to_non_equilibrium_ocean_tide";
ocean_tide_non_eq:source = < ocean_tide_neq_source >;
ocean_tide_non_eq:institution = < ocean tide neq insitution >;
ocean_tide_non_eq:units = "m";
ocean_tide_non_eq:scale_factor = 1.00e-04;
ocean_tide_non_eq:coordinates = "longitude latitude";
ocean_tide_non_eq:comment = "Named ocean_tide_non_equil in GDR-D standard. This parameter is computed as a correction to the parameter ocean_tide_equil; it contains the long-period ocean tide and the long-period load tide components. This value can be added to ocean_tide_eq (or ocean_tide_got, ocean_tide_fes) so that the resulting value models the total non equilibrium ocean tide height. See Jason-3 User Handbook";

short load_tide_got(time);

```
       load_tide_got:_FillValue = 32767s;
       load_tide_got:long_name = "load tide height for geocentric ocean tide (GOT
solution)";
       load_tide_got:source = < tidal_loading_got_source >;
       load_tide_got:institution = < tidal_loading_got_institution >;
       load_tide_got:units = "m";
       load_tide_got:scale_factor = 1.00e-04;
       load_tide_got:coordinates = "longitude latitude";
       load_tide_got:comment = "Named load_tide_sol1 in GDR-D standard. This value has
already been added to the corresponding ocean tide height value recorded in the product
(ocean_tide_got). See Jason-3 User Handbook";

short load_tide_fes(time);
       load_tide_fes:_FillValue = 32767s;
       load_tide_fes:long_name = "load tide height for geocentric ocean tide (FES
solution)";
       load_tide_fes:source = < tidal_loading_fes_source >;
       load_tide_fes:institution = < tidal_loading_fes_institution >;
       load_tide_fes:units = "m";
       load_tide_fes:scale_factor = 1.00e-04;
       load_tide_fes:coordinates = "longitude latitude";
       load_tide_fes:comment = "Named load_tide_sol2 in GDR-D standard. This value
contains the total load tide height (short-period and long-period) for the geocentric
ocean tide (FES solution). To get only the ocean tide height (FES solution), do:
ocean_tide_fes + ocean_tide_non_equil - load_tide_fes. See Jason-3 User Handbook";

short solid_earth_tide(time);
       solid_earth_tide:_FillValue = 32767s;
       solid_earth_tide:long_name = "solid earth tide height";
       solid_earth_tide:standard_name = "sea_surface_height_amplitude_due_to_earth_tide";
       solid_earth_tide:source = < solid_earth_tide_source >;
       solid_earth_tide:units = "m";
       solid_earth_tide:scale_factor = 1.00e-04;
       solid_earth_tide:coordinates = "longitude latitude";
       solid_earth_tide:comment = "Calculated using Cartwright and Tayler tables and
consisting of the second and third degree constituents. The permanent tide (zero
frequency) is not included. See Jason-3 User Handbook";

short pole_tide(time);
       pole_tide:_FillValue = 32767s;
       pole_tide:long_name = "geocentric pole tide height";
       pole_tide:standard_name = "sea_surface_height_amplitude_due_to_pole_tide";
       pole_tide:source = < pole_tide_source >;
       pole_tide:units = "m";
       pole_tide:scale_factor = 1.00e-04;
       pole_tide:coordinates = "longitude latitude";
       pole_tide:comment = "See Jason-3 User Handbook";

short internal_tide(time);
       internal_tide:_FillValue = 32767s;
       internal_tide:long_name = "internal tide height";
       internal_tide:source = < internal_tide_source >;
       internal_tide:units = "m";
       internal_tide:scale_factor = 1.00e-04;
       internal_tide:coordinates = "longitude latitude";
       internal_tide:quality_flag = "internal_tide_interp_qual";
       internal_tide:comment = "See Jason-3 User Handbook";
```

// Environmental parameters

```
short wind_speed_mod_u(time);
       wind_speed_mod_u:_FillValue = 32767s;
       wind_speed_mod_u:long_name = "U component of the model wind vector";
```

```
      wind_speed_mod_u:standard_name = "wind_speed";
      wind_speed_mod_u:source = "European Center for Medium Range Weather Forecasting";
      wind_speed_mod_u:institution = "ECMWF";
      wind_speed_mod_u:units = "m/s";
      wind_speed_mod_u:scale_factor = 1.00e-02;
      wind_speed_mod_u:coordinates = "longitude latitude";
      wind_speed_mod_u:quality_flag = "meteo_zero_altitude_interp_qual and
meteo_map_availability_flag";
      wind_speed_mod_u:comment = "Named wind_speed_model_u in GDR-D standard. Computed
at the altimeter time-tag from the interpolation of 2 meteorological fields that surround
the altimeter time-tag. See Jason-3 User Handbook";

short wind_speed_mod_v(time);
      wind_speed_mod_v:_FillValue = 32767s;
      wind_speed_mod_v:long_name = "V component of the model wind vector";
      wind_speed_mod_v:standard_name = "wind_speed";
      wind_speed_mod_v:source = "European Center for Medium Range Weather Forecasting";
      wind_speed_mod_v:institution = "ECMWF";
      wind_speed_mod_v:units = "m/s";
      wind_speed_mod_v:scale_factor = 1.00e-02;
      wind_speed_mod_v:coordinates = "longitude latitude";
      wind_speed_mod_v:quality_flag = "meteo_zero_altitude_interp_qual and
meteo_map_availability_flag";
      wind_speed_mod_v:comment = "Named wind_speed_model_v in GDR-D standard. Computed
at the altimeter time-tag from the interpolation of 2 meteorological fields that surround
the altimeter time-tag. See Jason-3 User Handbook";

short wind_speed_alt(time);
      wind_speed_alt:_FillValue = 32767s;
      wind_speed_alt:long_name = "altimeter wind speed";
      wind_speed_alt:standard_name = "wind_speed";
      wind_speed_alt:units = "m/s";
      wind_speed_alt:scale_factor = 1.00e-02;
      wind_speed_alt:coordinates = "longitude latitude";
      wind_speed_alt:comment = "Should not be used over land. See Jason-3 User Handbook.
A calibration bias of +0.14 06 dB has been added to the Ku band backscatter coefficient
(/data_01/ku/sig0_ocean) before computing the wind speed";

short wind_speed_alt_mle3(time);
      wind_speed_alt_mle3:_FillValue = 32767s;
      wind_speed_alt_mle3:long_name = "altimeter wind speed (MLE3 retracking)";
      wind_speed_alt_mle3:standard_name = "wind_speed";
      wind_speed_alt_mle3:units = "m/s";
      wind_speed_alt_mle3:scale_factor = 1.00e-02;
      wind_speed_alt_mle3:coordinates = "longitude latitude";
      wind_speed_alt_mle3:comment = "Should not be used over land. See Jason-3 User
Handbook. A calibration bias of +0.109 dB has been added to the Ku band backscatter
coefficient (/data_01/ku/sig0_ocean_mle3) before computing the wind speed";

short wind_speed_alt_adaptive(time);
      wind_speed_alt_adaptive:_FillValue = 32767s;
      wind_speed_alt_adaptive:long_name = "altimeter wind speed (adaptive retracking)";
      wind_speed_alt_adaptive:standard_name = "wind_speed";
      wind_speed_alt_adaptive:units = "m/s";
      wind_speed_alt_adaptive:scale_factor = 1.00e-02;
      wind_speed_alt_adaptive:coordinates = "longitude latitude";
      wind_speed_alt_adaptive:comment = "Should not be used over land. See Jason-3 User
Handbook. A calibration bias of +0.109 08 dB has been added to the Ku band backscatter
coefficient (/data_01/ku/sig0_adaptive) before computing the wind speed";

short rad_wind_speed(time);
      rad_wind_speed:_FillValue = 32767s;
      rad_wind_speed:long_name = "radiometer wind speed";
      rad_wind_speed:standard_name = "wind_speed";
      rad_wind_speed:source = "AMR";
```

```
       rad_wind_speed:institution = "NASA/JPL";
       rad_wind_speed:units = "m/s";
       rad_wind_speed:scale_factor = 1.00e-02;
       rad_wind_speed:coordinates = "longitude latitude";
       rad_wind_speed:comment = "Named wind_speed_rad in GDR-D standard. Should not be
used over land. See Jason-3 User Handbook";

short rad_water_vapor(time);
       rad_water_vapor:_FillValue = 32767s;
       rad_water_vapor:long_name = "radiometer water vapor content";
       rad_water_vapor:standard_name = "atmosphere_water_vapor_content";
       rad_water_vapor:source = "AMR";
       rad_water_vapor:institution = "NASA/JPL";
       rad_water_vapor:units = "kg/m^2";
       rad_water_vapor:scale_factor = 1.00e-01;
       rad_water_vapor:coordinates = "longitude latitude";
       rad_water_vapor:quality_flag = "rad_tb_187_qual and rad_tb_238_qual and
rad_tb_340_qual and rad_tb_interp_qual";
       rad_water_vapor:comment = "Should not be used over land";

short rad_cloud_liquid_water(time);
       rad_cloud_liquid_water:_FillValue = 32767s;
       rad_cloud_liquid_water:long_name = "radiometer liquid water content";
       rad_cloud_liquid_water:standard_name = "atmosphere_cloud_liquid_water_content";
       rad_cloud_liquid_water:source = "AMR";
       rad_cloud_liquid_water:institution = "NASA/JPL";
       rad_cloud_liquid_water:units = "kg/m^2";
       rad_cloud_liquid_water:scale_factor = 1.00e-02;
       rad_cloud_liquid_water:coordinates = "longitude latitude";
       rad_cloud_liquid_water:quality_flag = "rad_tb_187_qual and rad_tb_238_qual and
rad_tb_340_qual and rad_tb_interp_qual";
       rad_cloud_liquid_water:comment = "Named rad_liquid_ water in GDR-D standard.
Should not be used over land";

short sst(time);
       sst:_FillValue = 32767s;
       sst:long_name = "sea surface temperature";
       sst:standard_name = "sea_surface_temperature";
       sst:source = < sst_source >;
       sst:institution = < sst_institution >;
       sst:units = "K";
       sst:scale_factor = 1.00e-02;
       sst:coordinates = "longitude latitude";

short mean_wave_period_t02(time);
       mean_wave_period_t02:_FillValue = 32767s;
       mean_wave_period_t02:long_name = "t02 mean wave period";
       mean_wave_period_t02:standard_name =
"sea_surface_wind_wave_mean_period_from_variance_spectral_density_second_frequency_moment
";
       mean_wave_period_t02:source = < wave_model_source >;
       mean_wave_period_t02:institution = < wave_model_institution >;
       mean_wave_period_t02:units = "s";
       mean_wave_period_t02:scale_factor = 1.00e-02;
       mean_wave_period_t02:coordinates = "longitude latitude";
       mean_wave_period_t02:quality_flag = "wave_model_interp_qual and
wave_model_map_availability_flag";

int mean_wave_direction(time);
       mean_wave_direction:_FillValue = 2147483647;
       mean_wave_direction:long_name = "mean direction of the sea surface wave";
       mean_wave_direction:standard_name = "sea_surface_wave_from_direction";
       mean_wave_direction:source = < wave_model_source >;
       mean_wave_direction:institution = < wave_model_institution >;
       mean_wave_direction:units = "degrees";
```

```
       mean_wave_direction:scale_factor = 1.00e-02;
       mean_wave_direction:coordinates = "longitude latitude";
       mean_wave_direction:quality_flag = "wave_model_interp_qual and
wave_model_map_availability_flag";

short sea_ice_concentration(time);
       sea_ice_concentration:_FillValue = 32767s;
       sea_ice_concentration:long_name = "sea ice concentration";
       sea_ice_concentration:standard_name = "sea_ice_area_fraction";
       sea_ice_concentration:source = < sea ice concentration source >;
       sea_ice_concentration:institution = < sea ice concentration institution >;
       sea_ice_concentration:units = "1";
       sea_ice_concentration:scale_factor = 1.00e-02;
       sea_ice_concentration:coordinates = "longitude latitude";
       sea_ice_concentration:quality_flag = "sea_ice_concentration_interp_qual";
       sea_ice_concentration:comment = "percentage between 0 and 100";
```

// 1-Hz Ku band data

```
group: ku {

  variables:
```

// Quality information and sensor status

```
       // Altimeter state flags

byte alt_state_band_status_flag(time);
       alt_state_band_status_flag:_FillValue = 127b;
       alt_state_band_status_flag:long_name = "altimeter state flag: Ku band status";
       alt_state_band_status_flag:flag_meanings = "On Off";
       alt_state_band_status_flag:flag_values = 0b, 1b;
       alt_state_band_status_flag:coordinates = "/data_01/longitude /data_01/latitude";
       alt_state_band_status_flag:comment = "Named alt_state_flag_ku_band_status in GDR-D
standard";

       // Quality flags for 1Hz altimeter data

byte range_ocean_compression_qual(time);
       range_ocean_compression_qual:_FillValue = 127b;
       range_ocean_compression_qual:long_name = "quality flag for 1 Hz altimeter data: Ku
band range";
       range_ocean_compression_qual:flag_meanings = "good bad";
       range_ocean_compression_qual:flag_values = 0b, 1b;
       range_ocean_compression_qual:coordinates = "/data_01/longitude /data_01/latitude";
       range_ocean_compression_qual:comment = "Named qual_alt_1hz_range_ku in GDR-D
standard";

byte range_ocean_mle3_compression_qual(time);
       range_ocean_mle3_compression_qual:_FillValue = 127b;
       range_ocean_mle3_compression_qual:long_name = "quality flag for 1 Hz altimeter
data: Ku band range (MLE3 retracking)";
       range_ocean_mle3_compression_qual:flag_meanings = "good bad";
       range_ocean_mle3_compression_qual:flag_values = 0b, 1b;
       range_ocean_mle3_compression_qual:coordinates = "/data_01/longitude
/data_01/latitude";
       range_ocean_mle3_compression_qual:comment = "Named qual_alt_1hz_range_ku_mle3 in
GDR-D standard";
```

```
byte range_adaptive_compression_qual(time);
       range_adaptive_compression_qual:_FillValue = 127b;
       range_adaptive_compression_qual:long_name = "quality flag for 1 Hz altimeter data:
Ku band range (adaptive retracking)";
       range_adaptive_compression_qual:flag_meanings = "good bad";
       range_adaptive_compression_qual:flag_values = 0b, 1b;
       range_adaptive_compression_qual:coordinates = "/data_01/longitude
/data_01/latitude";

byte swh_ocean_compression_qual(time);
       swh_ocean_compression_qual:_FillValue = 127b;
       swh_ocean_compression_qual:long_name = "quality flag for 1 Hz altimeter data: Ku
band SWH";
       swh_ocean_compression_qual:flag_meanings = "good bad";
       swh_ocean_compression_qual:flag_values = 0b, 1b;
       swh_ocean_compression_qual:coordinates = "/data_01/longitude /data_01/latitude";
       swh_ocean_compression_qual:comment = "Named qual_alt_1hz_swh_ku in GDR-D
standard";

byte swh_ocean_mle3_compression_qual(time);
       swh_ocean_mle3_compression_qual:_FillValue = 127b;
       swh_ocean_mle3_compression_qual:long_name = "quality flag for 1 Hz altimeter data:
Ku band SWH (MLE3 retracking)";
       swh_ocean_mle3_compression_qual:flag_meanings = "good bad";
       swh_ocean_mle3_compression_qual:flag_values = 0b, 1b;
       swh_ocean_mle3_compression_qual:coordinates = "/data_01/longitude
/data_01/latitude";
       swh_ocean_mle3_compression_qual:comment = "Named qual_alt_1hz_swh_ku_mle3 in GDR-D
standard";

byte swh_adaptive_compression_qual(time);
       swh_adaptive_compression_qual:_FillValue = 127b;
       swh_adaptive_compression_qual:long_name = "quality flag for 1 Hz altimeter data:
Ku band SWH (adaptive retracking)";
       swh_adaptive_compression_qual:flag_meanings = "good bad";
       swh_adaptive_compression_qual:flag_values = 0b, 1b;
       swh_adaptive_compression_qual:coordinates = "/data_01/longitude
/data_01/latitude";

byte sig0_ocean_compression_qual(time);
       sig0_ocean_compression_qual:_FillValue = 127b;
       sig0_ocean_compression_qual:long_name = "quality flag for 1 Hz altimeter data: Ku
band backscatter coefficient";
       sig0_ocean_compression_qual:flag_meanings = "good bad";
       sig0_ocean_compression_qual:flag_values = 0b, 1b;
       sig0_ocean_compression_qual:coordinates = "/data_01/longitude /data_01/latitude";
       sig0_ocean_compression_qual:comment = "Named qual_alt_1hz_sig0_ku in GDR-D
standard";

byte sig0_ocean_mle3_compression_qual(time);
       sig0_ocean_mle3_compression_qual:_FillValue = 127b;
       sig0_ocean_mle3_compression_qual:long_name = "quality flag for 1 Hz altimeter
data: Ku band backscatter coefficient (MLE3 retracking)";
       sig0_ocean_mle3_compression_qual:flag_meanings = "good bad";
       sig0_ocean_mle3_compression_qual:flag_values = 0b, 1b;
       sig0_ocean_mle3_compression_qual:coordinates = "/data_01/longitude
/data_01/latitude";
       sig0_ocean_mle3_compression_qual:comment = "Named qual_alt_1hz_sig0_ku_mle3 in
GDR-D standard";

byte sig0_adaptive_compression_qual(time);
       sig0_adaptive_compression_qual:_FillValue = 127b;
       sig0_adaptive_compression_qual:long_name = "quality flag for 1 Hz altimeter data:
Ku band backscatter coefficient (adaptive retracking)";
```

```
       sig0_adaptive_compression_qual:flag_meanings = "good bad";
       sig0_adaptive_compression_qual:flag_values = 0b, 1b;
       sig0_adaptive_compression_qual:coordinates = "/data_01/longitude
/data_01/latitude";

byte off_nadir_angle_wf_ocean_compression_qual(time);
       off_nadir_angle_wf_ocean_compression_qual:_FillValue = 127b;
       off_nadir_angle_wf_ocean_compression_qual:long_name = "quality flag for 1 Hz
altimeter data: off nadir angle from Ku band";
       off_nadir_angle_wf_ocean_compression_qual:flag_meanings = "good bad";
       off_nadir_angle_wf_ocean_compression_qual:flag_values = 0b, 1b;
       off_nadir_angle_wf_ocean_compression_qual:coordinates = "/data_01/longitude
/data_01/latitude";
       off_nadir_angle_wf_ocean_compression_qual:comment = "Named
qual_alt_1hz_off_nadir_angle_wf_ku in GDR-D standard";

       // Quality flags for 1 Hz altimeter instrumental corrections

byte range_cor_ocean_net_instr_qual(time);
       range_cor_ocean_net_instr_qual:_FillValue = 127b;
       range_cor_ocean_net_instr_qual:long_name = "quality flag for 1 Hz instrumental
correction: Ku band range";
       range_cor_ocean_net_instr_qual:flag_meanings = "good bad";
       range_cor_ocean_net_instr_qual:flag_values = 0b, 1b;
       range_cor_ocean_net_instr_qual:coordinates = "/data_01/longitude
/data_01/latitude";
       range_cor_ocean_net_instr_qual:comment = "Named qual_inst_corr_1hz_range_ku in
GDR-D standard. Threshold control of range_cor_ocean_net_instr";

byte swh_cor_ocean_net_instr_qual(time);
       swh_cor_ocean_net_instr_qual:_FillValue = 127b;
       swh_cor_ocean_net_instr_qual:long_name = "quality flag for 1 Hz instrumental
correction: Ku band SWH";
       swh_cor_ocean_net_instr_qual:flag_meanings = "good bad";
       swh_cor_ocean_net_instr_qual:flag_values = 0b, 1b;
       swh_cor_ocean_net_instr_qual:coordinates = "/data_01/longitude /data_01/latitude";
       swh_cor_ocean_net_instr_qual:comment = "Named qual_inst_corr_1hz_swh_ku in GDR-D
standard. Threshold control of swh_cor_ocean_net_instr";

byte sig0_cor_ocean_net_instr_qual(time);
       sig0_cor_ocean_net_instr_qual:_FillValue = 127b;
       sig0_cor_ocean_net_instr_qual:long_name = "quality flag for 1 Hz instrumental
correction: Ku band backscatter coefficient";
       sig0_cor_ocean_net_instr_qual:flag_meanings = "good bad";
       sig0_cor_ocean_net_instr_qual:flag_values = 0b, 1b;
       sig0_cor_ocean_net_instr_qual:coordinates = "/data_01/longitude
/data_01/latitude";
       sig0_cor_ocean_net_instr_qual:comment = "Named qual_inst_corr_1hz_sig0_ku in GDR-D
standard. Threshold control of sig0_cor_ocean_net_instr";

       // Quality flags for interpolation

byte iono_cor_alt_filtered_qual(time);
       iono_cor_alt_filtered_qual:_FillValue = 127b;
       iono_cor_alt_filtered_qual:long_name = "filtered altimeter ionospheric correction
quality flag";
       iono_cor_alt_filtered_qual:flag_meanings = "filtered interpolated bad";
       iono_cor_alt_filtered_qual:flag_values = 0b, 1b, 2b;
       iono_cor_alt_filtered_qual:coordinates = "/data_01/longitude /data_01/latitude";

byte iono_cor_alt_filtered_mle3_qual(time);
       iono_cor_alt_filtered_mle3_qual:_FillValue = 127b;
```

```
      iono_cor_alt_filtered_mle3_qual:long_name = "filtered altimeter ionospheric
correction quality flag (MLE3 retracking)";
      iono_cor_alt_filtered_mle3_qual:flag_meanings = "filtered interpolated bad";
      iono_cor_alt_filtered_mle3_qual:flag_values = 0b, 1b, 2b;
      iono_cor_alt_filtered_mle3_qual:coordinates = "/data_01/longitude
/data_01/latitude";

byte iono_cor_alt_filtered_adaptive_qual(time);
      iono_cor_alt_filtered_adaptive_qual:_FillValue = 127b;
      iono_cor_alt_filtered_adaptive_qual:long_name = "filtered altimeter ionospheric
correction quality flag (adaptive retracking)";
      iono_cor_alt_filtered_adaptive_qual:flag_meanings = "filtered interpolated bad";
      iono_cor_alt_filtered_adaptive_qual:flag_values = 0b, 1b, 2b;
      iono_cor_alt_filtered_adaptive_qual:coordinates = "/data_01/longitude
/data_01/latitude";
```

// Altimeter range

```
int range_ocean(time);
      range_ocean:_FillValue = 2147483647;
      range_ocean:long_name = "1 Hz Ku band corrected altimeter range";
      range_ocean:standard_name = "altimeter_range";
      range_ocean:units = "m";
      range_ocean:add_offset = 1.300000e+06;
      range_ocean:scale_factor = 1.00e-04;
      range_ocean:coordinates = "/data_01/longitude /data_01/latitude";
      range_ocean:quality_flag = "range_ocean_compression_qual";
      range_ocean:comment = "Named range_ku in GDR-D standard. All instrumental
corrections included, i.e. distance antenna-COG (/data_01/range_cor_cog), USO drift
correction (/data_01/range_cor_uso), internal path correction (range_cor_internal_path),
Doppler correction (range_cor_doppler), modeled instrumental errors correction
(range_cor_ocean_model_instr) and system bias";

short range_ocean_rms(time);
      range_ocean_rms:_FillValue = 32767s;
      range_ocean_rms:long_name = "RMS of the Ku band range";
      range_ocean_rms:units = "m";
      range_ocean_rms:scale_factor = 1.00e-04;
      range_ocean_rms:coordinates = "/data_01/longitude /data_01/latitude";
      range_ocean_rms:comment = "Named range_rms_ku in GDR-D standard. Compression of Ku
band high rate elements is preceded by a detection of outliers. Only valid high-rate
values are used to compute this element";

byte range_ocean_numval(time);
      range_ocean_numval:_FillValue = 127b;
      range_ocean_numval:long_name = "number of valid points for Ku band range";
      range_ocean_numval:units = "count";
      range_ocean_numval:coordinates = "/data_01/longitude /data_01/latitude";
      range_ocean_numval:valid_min = 0b;
      range_ocean_numval:valid_max = 20b;
      range_ocean_numval:comment = "Named range_numval_ku in GDR-D standard";
```

// Altimeter range -– ocean-2 (MLE3)

```
int range_ocean_mle3(time);
      range_ocean_mle3:_FillValue = 2147483647;
      range_ocean_mle3:long_name = "1 Hz Ku band corrected altimeter range (MLE3
retracking)";
      range_ocean_mle3:standard_name = "altimeter_range";
      range_ocean_mle3:units = "m";
      range_ocean_mle3:add_offset = 1.300000e+06;
```

```
      range_ocean_mle3:scale_factor = 1.00e-04;
      range_ocean_mle3:coordinates = "/data_01/longitude /data_01/latitude";
      range_ocean_mle3:quality_flag = "range_ocean_mle3_compression_qual";
      range_ocean_mle3:comment = "Named range_ku_mle3 in GDR-D standard. All
instrumental corrections included, i.e. distance antenna-COG (/data_01/range_cor_cog),
USO drift correction (/data_01/range_cor_uso), internal path correction
(range_cor_internal_path), Doppler correction (range_cor_doppler), modeled instrumental
errors correction (range_cor_ocean_mle3_model_instr) and system bias";

short range_ocean_mle3_rms(time);
      range_ocean_mle3_rms:_FillValue = 32767s;
      range_ocean_mle3_rms:long_name = "RMS of the Ku band range (MLE3 retracking)";
      range_ocean_mle3_rms:units = "m";
      range_ocean_mle3_rms:scale_factor = 1.00e-04;
      range_ocean_mle3_rms:coordinates = "/data_01/longitude /data_01/latitude";
      range_ocean_mle3_rms:comment = "Named range_rms_ku_mle3 in GDR-D standard.
Compression of Ku band high rate elements is preceded by a detection of outliers. Only
valid high-rate values are used to compute this element";

byte range_ocean_mle3_numval(time);
      range_ocean_mle3_numval:_FillValue = 127b;
      range_ocean_mle3_numval:long_name = "number of valid points for Ku band range
(MLE3 retracking)";
      range_ocean_mle3_numval:units = "count";
      range_ocean_mle3_numval:coordinates = "/data_01/longitude /data_01/latitude";
      range_ocean_mle3_numval:valid_min = 0b;
      range_ocean_mle3_numval:valid_max = 20b;
      range_ocean_mle3_numval:comment = "Named range_numval_ku_mle3 in GDR-D standard";
```

// Altimeter range – - adaptive

```
int range_adaptive(time);
      range_adaptive:_FillValue = 2147483647;
      range_adaptive:long_name = "1 Hz Ku band corrected altimeter range (adaptive
retracking)";
      range_adaptive:standard_name = "altimeter_range";
      range_adaptive:units = "m";
      range_adaptive:add_offset = 1.300000e+06;
      range_adaptive:scale_factor = 1.00e-04;
      range_adaptive:coordinates = "/data_01/longitude /data_01/latitude";
      range_adaptive:quality_flag = "range_adaptive_compression_qual";
      range_adaptive:comment = "All instrumental corrections included, i.e. distance
antenna-COG (/data_01/range_cor_cog), USO drift correction (/data_01/range_cor_uso),
internal path correction (range_cor_internal_path), Doppler correction
(range_cor_doppler) and system bias";

short range_adaptive_rms(time);
      range_adaptive_rms:_FillValue = 32767s;
      range_adaptive_rms:long_name = "RMS of the Ku band range (adaptive retracking)";
      range_adaptive_rms:units = "m";
      range_adaptive_rms:scale_factor = 1.00e-04;
      range_adaptive_rms:coordinates = "/data_01/longitude /data_01/latitude";
      range_adaptive_rms:comment = "Compression of Ku band high rate elements is
preceded by a detection of outliers. Only valid high-rate values are used to compute this
element";

byte range_adaptive_numval(time);
      range_adaptive_numval:_FillValue = 127b;
      range_adaptive_numval:long_name = "number of valid points for Ku band range
(adaptive retracking)";
      range_adaptive_numval:units = "count";
      range_adaptive_numval:coordinates = "/data_01/longitude /data_01/latitude";
      range_adaptive_numval:valid_min = 0b;
```

```
       range_adaptive_numval:valid_max = 20b;
```

// Altimeter range corrections

```
int range_cor_ocean_net_instr(time);
       range_cor_ocean_net_instr:_FillValue = 2147483647;
       range_cor_ocean_net_instr:long_name = "net instrumental correction on the Ku band
range";
       range_cor_ocean_net_instr:units = "m";
       range_cor_ocean_net_instr:scale_factor = 1.00e-04;
       range_cor_ocean_net_instr:coordinates = "/data_01/longitude /data_01/latitude";
       range_cor_ocean_net_instr:quality_flag = "range_cor_ocean_net_instr_qual";
       range_cor_ocean_net_instr:comment = "Named net_instr_corr_range_ku in GDR-D
standard. Sum of distance antenna-COG (/data_01/range_cor_cog), USO drift correction
(/data_01/range_cor_uso), internal path correction (range_cor_internal_path), Doppler
correction (range_cor_doppler), modeled instrumental errors correction
(range_cor_ocean_model_instr) and system bias";

int range_cor_ocean_mle3_net_instr(time);
       range_cor_ocean_mle3_net_instr:_FillValue = 2147483647;
       range_cor_ocean_mle3_net_instr:long_name = "net instrumental correction on the Ku
band range (MLE3 retracking)";
       range_cor_ocean_mle3_net_instr:units = "m";
       range_cor_ocean_mle3_net_instr:scale_factor = 1.00e-04;
       range_cor_ocean_mle3_net_instr:coordinates = "/data_01/longitude
/data_01/latitude";
       range_cor_ocean_mle3_net_instr:comment = "Named net_instr_corr_range_ku_mle3 in
GDR-D standard. Sum of distance antenna-COG (/data_01/range_cor_cog), USO drift
correction (/data_01/range_cor_uso), internal path correction (range_cor_internal_path),
Doppler correction (range_cor_doppler), modeled instrumental errors correction
(range_cor_ocean_mle3_model_instr) and system bias";

int range_cor_adaptive_net_instr(time);
       range_cor_adaptive_net_instr:_FillValue = 2147483647;
       range_cor_adaptive_net_instr:long_name = "net instrumental correction on the Ku
band range (adaptive retracking)";
       range_cor_adaptive_net_instr:units = "m";
       range_cor_adaptive_net_instr:scale_factor = 1.00e-04;
       range_cor_adaptive_net_instr:coordinates = "/data_01/longitude /data_01/latitude";
       range_cor_adaptive_net_instr:comment = "Sum of distance antenna-COG
(/data_01/range_cor_cog), USO drift correction (/data_01/range_cor_uso), internal path
correction (range_cor_internal_path), Doppler correction (range_cor_doppler) and system
bias";

short iono_cor_alt(time);
       iono_cor_alt:_FillValue = 32767s;
       iono_cor_alt:long_name = "altimeter ionospheric correction on Ku band";
       iono_cor_alt:standard_name = "altimeter_range_correction_due_to_ionosphere";
       iono_cor_alt:source = "Poseidon-3B";
       iono_cor_alt:institution = "CNES";
       iono_cor_alt:units = "m";
       iono_cor_alt:scale_factor = 1.00e-04;
       iono_cor_alt:coordinates = "/data_01/longitude /data_01/latitude";
       iono_cor_alt:comment = "Named iono_corr_alt_ku in GDR-D standard. An ionospheric
correction must be added (negative value) to the instrument range to correct this range
measurement for ionospheric range delays of the radar pulse. See Jason-3 User Handbook";

short iono_cor_alt_mle3(time);
       iono_cor_alt_mle3:_FillValue = 32767s;
       iono_cor_alt_mle3:long_name = "altimeter ionospheric correction on Ku band (MLE3
retracking)";
       iono_cor_alt_mle3:standard_name = "altimeter_range_correction_due_to_ionosphere";
       iono_cor_alt_mle3:source = "Poseidon-3B";
```

```
        iono_cor_alt_mle3:institution = "CNES";
        iono_cor_alt_mle3:units = "m";
        iono_cor_alt_mle3:scale_factor = 1.00e-04;
        iono_cor_alt_mle3:coordinates = "/data_01/longitude /data_01/latitude";
        iono_cor_alt_mle3:comment = "Named iono_corr_alt_ku_mle3 in GDR-D standard. An
ionospheric correction must be added (negative value) to the instrument range to correct
this range measurement for ionospheric range delays of the radar pulse. See Jason-3 User
Handbook";

short iono_cor_alt_adaptive(time);
        iono_cor_alt_adaptive:_FillValue = 32767s;
        iono_cor_alt_adaptive:long_name = "altimeter ionospheric correction on Ku band
(adaptive retracking)";
        iono_cor_alt_adaptive:standard_name =
"altimeter_range_correction_due_to_ionosphere";
        iono_cor_alt_adaptive:source = "Poseidon-3B";
        iono_cor_alt_adaptive:institution = "CNES";
        iono_cor_alt_adaptive:units = "m";
        iono_cor_alt_adaptive:scale_factor = 1.00e-04;
        iono_cor_alt_adaptive:coordinates = "/data_01/longitude /data_01/latitude";
        iono_cor_alt_adaptive:comment = "An ionospheric correction must be added (negative
value) to the instrument range to correct this range measurement for ionospheric range
delays of the radar pulse. See Jason-3 User Handbook";

short iono_cor_alt_filtered(time);
        iono_cor_alt_filtered:_FillValue = 32767s;
        iono_cor_alt_filtered:long_name = "filtered altimeter ionospheric correction on Ku
band";
        iono_cor_alt_filtered:standard_name =
"altimeter_range_correction_due_to_ionosphere";
        iono_cor_alt_filtered:source = "Poseidon-3B";
        iono_cor_alt_filtered:institution = "CNES";
        iono_cor_alt_filtered:units = "m";
        iono_cor_alt_filtered:scale_factor = 1.00e-04;
        iono_cor_alt_filtered:coordinates = "/data_01/longitude /data_01/latitude";
        iono_cor_alt_filtered:quality_flag = "iono_cor_alt_filtered_qual";
        iono_cor_alt_filtered:comment = "An ionospheric correction must be added (negative
value) to the instrument range to correct this range measurement for ionospheric range
delays of the radar pulse. See Jason-3 User Handbook";

short iono_cor_alt_filtered_mle3(time);
        iono_cor_alt_filtered_mle3:_FillValue = 32767s;
        iono_cor_alt_filtered_mle3:long_name = "filtered altimeter ionospheric correction
on Ku band (MLE3 retracking)";
        iono_cor_alt_filtered_mle3:standard_name =
"altimeter_range_correction_due_to_ionosphere";
        iono_cor_alt_filtered_mle3:source = "Poseidon-3B";
        iono_cor_alt_filtered_mle3:institution = "CNES";
        iono_cor_alt_filtered_mle3:units = "m";
        iono_cor_alt_filtered_mle3:scale_factor = 1.00e-04;
        iono_cor_alt_filtered_mle3:coordinates = "/data_01/longitude /data_01/latitude";
        iono_cor_alt_filtered_mle3:quality_flag = "iono_cor_alt_filtered_mle3_qual";
        iono_cor_alt_filtered_mle3:comment = "An ionospheric correction must be added
(negative value) to the instrument range to correct this range measurement for
ionospheric range delays of the radar pulse. See Jason-3 User Handbook";

short iono_cor_alt_filtered_adaptive(time);
        iono_cor_alt_filtered_adaptive:_FillValue = 32767s;
        iono_cor_alt_filtered_adaptive:long_name = "filtered altimeter ionospheric
correction on Ku band (adaptive retracking)";
        iono_cor_alt_filtered_adaptive:standard_name =
"altimeter_range_correction_due_to_ionosphere";
        iono_cor_alt_filtered_adaptive:source = "Poseidon-3B";
        iono_cor_alt_filtered_adaptive:institution = "CNES";
```

```
      iono_cor_alt_filtered_adaptive:units = "m";
      iono_cor_alt_filtered_adaptive:scale_factor = 1.00e-04;
      iono_cor_alt_filtered_adaptive:coordinates = "/data_01/longitude
/data_01/latitude";
      iono_cor_alt_filtered_adaptive:quality_flag =
"iono_cor_alt_filtered_adaptive_qual";
      iono_cor_alt_filtered_adaptive:comment = "An ionospheric correction must be added
(negative value) to the instrument range to correct this range measurement for
ionospheric range delays of the radar pulse. See Jason-3 User Handbook";

short iono_cor_gim(time);
      iono_cor_gim:_FillValue = 32767s;
      iono_cor_gim:long_name = "GIM ionospheric correction on Ku band";
      iono_cor_gim:standard_name = "altimeter_range_correction_due_to_ionosphere";
      iono_cor_gim:institution = "NASA/JPL";
      iono_cor_gim:units = "m";
      iono_cor_gim:scale_factor = 1.00e-04;
      iono_cor_gim:coordinates = "/data_01/longitude /data_01/latitude";
      iono_cor_gim:comment = "Named iono_corr_gim_ku in GDR-D standard. An ionospheric
correction must be added (negative value) to the instrument range to correct this range
measurement for ionospheric range delays of the radar pulse. See Jason-3 User Handbook";

short sea_state_bias(time);
      sea_state_bias:_FillValue = 32767s;
      sea_state_bias:long_name = "sea state bias correction in Ku band";
      sea_state_bias:standard_name =
"sea_surface_height_bias_due_to_sea_surface_roughness";
      sea_state_bias:source = < ssb_source >;
      sea_state_bias:institution = < ssb_institution >;
      sea_state_bias:units = "m";
      sea_state_bias:scale_factor = 1.00e-04;
      sea_state_bias:coordinates = "/data_01/longitude /data_01/latitude";
      sea_state_bias:comment = "Named sea_state_bias_ku in GDR-D standard. A sea state
bias correction must be added (negative value) to the instrument range to correct this
range measurement for sea state delays of the radar pulse. This element should not be
used over land. See Jason-3 User Handbook";

short sea_state_bias_mle3(time);
      sea_state_bias_mle3:_FillValue = 32767s;
      sea_state_bias_mle3:long_name = "sea state bias correction in Ku band (MLE3
retracking)";
      sea_state_bias_mle3:standard_name =
"sea_surface_height_bias_due_to_sea_surface_roughness";
      sea_state_bias_mle3:source = < ssb_mle3_source >;
      sea_state_bias_mle3:institution = < ssb_mle3_institution >;
      sea_state_bias_mle3:units = "m";
      sea_state_bias_mle3:scale_factor = 1.00e-04;
      sea_state_bias_mle3:coordinates = "/data_01/longitude /data_01/latitude";
      sea_state_bias_mle3:comment = "Named sea_state_bias_ku_mle3 in GDR-D standard. A
sea state bias correction must be added (negative value) to the instrument range to
correct this range measurement for sea state delays of the radar pulse. This element
should not be used over land. See Jason-3 User Handbook";

short sea_state_bias_adaptive(time);
      sea_state_bias_adaptive:_FillValue = 32767s;
      sea_state_bias_adaptive:long_name = "sea state bias correction in Ku band
(adaptive retracking)";
      sea_state_bias_adaptive:standard_name =
"sea_surface_height_bias_due_to_sea_surface_roughness";
      sea_state_bias_adaptive:source = < ssb_adaptive_source >;
      sea_state_bias_adaptive:institution = < ssb_adaptive_institution >;
      sea_state_bias_adaptive:units = "m";
      sea_state_bias_adaptive:scale_factor = 1.00e-04;
      sea_state_bias_adaptive:coordinates = "/data_01/longitude /data_01/latitude";
```

```
      sea_state_bias_adaptive:comment = "A sea state bias correction must be added
(negative value) to the instrument range to correct this range measurement for sea state
delays of the radar pulse. This element should not be used over land. See Jason-3 User
Handbook";

short sea_state_bias_3d_mp2(time);
      sea_state_bias_3d_mp2:_FillValue = 32767s;
      sea_state_bias_3d_mp2:long_name = "sea state bias correction in Ku band computed
from 3d model";
      sea_state_bias_3d_mp2:standard_name =
"sea_surface_height_bias_due_to_sea_surface_roughness";
      sea_state_bias_3d_mp2:source = < ssb_3d_source >;
      sea_state_bias_3d_mp2:institution = < ssb_3d_institution >;
      sea_state_bias_3d_mp2:units = "m";
      sea_state_bias_3d_mp2:scale_factor = 1.00e-04;
      sea_state_bias_3d_mp2:coordinates = "/data_01/longitude /data_01/latitude";
      sea_state_bias_3d_mp2:quality_flag = "wave_model_interp_qual and
wave_model_map_availability_flag";
      sea_state_bias_3d_mp2:comment = "Sea state bias computed from 3D model with mean
wave period (T02) as third input. A sea state bias correction must be added (negative
value) to the instrument range to correct this range measurement for sea state delays of
the radar pulse. This element should not be used over land. See Jason-3 User Handbook";

short sea_state_bias_adaptive_3d_mp2(time);
      sea_state_bias_adaptive_3d_mp2:_FillValue = 32767s;
      sea_state_bias_adaptive_3d_mp2:long_name = "sea state bias correction in Ku band
computed from 3d model";
      sea_state_bias_adaptive_3d_mp2:standard_name =
"sea_surface_height_bias_due_to_sea_surface_roughness";
      sea_state_bias_adaptive_3d_mp2:source = < ssb_adaptive_3d_source >;
      sea_state_bias_adaptive_3d_mp2:institution = < ssb_adaptive_3d_institution >;
      sea_state_bias_adaptive_3d_mp2:units = "m";
      sea_state_bias_adaptive_3d_mp2:scale_factor = 1.00e-04;
      sea_state_bias_adaptive_3d_mp2:coordinates = "/data_01/longitude
/data_01/latitude";
      sea_state_bias_adaptive_3d_mp2:quality_flag = "wave_model_interp_qual and
wave_model_map_availability_flag";
      sea_state_bias_adaptive_3d_mp2:comment = "Sea state bias computed from 3D model
with mean wave period (T02) as third input. A sea state bias correction must be added
(negative value) to the instrument range to correct this range measurement for sea state
delays of the radar pulse. This element should not be used over land. See Jason-3 User
Handbook";
```

// Significant waveheight

```
short swh_ocean(time);
      swh_ocean:_FillValue = 32767s;
      swh_ocean:long_name = "Ku band corrected significant waveheight";
      swh_ocean:standard_name = "sea_surface_wave_significant_height";
      swh_ocean:units = "m";
      swh_ocean:scale_factor = 1.00e-03;
      swh_ocean:coordinates = "/data_01/longitude /data_01/latitude";
      swh_ocean:quality_flag = "swh_ocean_compression_qual";
      swh_ocean:comment = "Named swh_ku in GDR-D standard. All instrumental corrections
included, i.e. modeled instrumental errors correction (swh_cor_ocean_model_instr) and
system bias";

short swh_ocean_rms(time);
      swh_ocean_rms:_FillValue = 32767s;
      swh_ocean_rms:long_name = "RMS of the Ku band significant waveheight";
      swh_ocean_rms:units = "m";
      swh_ocean_rms:scale_factor = 1.00e-03;
      swh_ocean_rms:coordinates = "/data_01/longitude /data_01/latitude";
```

```
      swh_ocean_rms:comment = "Named swh_rms_ku in GDR-D standard. Compression of Ku
band high rate elements is preceded by a detection of outliers. Only valid high-rate
values are used to compute this element";

byte swh_ocean_numval(time);
      swh_ocean_numval:_FillValue = 127b;
      swh_ocean_numval:long_name = "number of valid points used to compute Ku band
significant waveheight";
      swh_ocean_numval:units = "count";
      swh_ocean_numval:coordinates = "/data_01/longitude /data_01/latitude";
      swh_ocean_numval:valid_min = 0b;
      swh_ocean_numval:valid_max = 20b;
      swh_ocean_numval:comment = "Named swh_numval_ku in GDR-D standard. Compression of
Ku band high rate elements is preceded by a detection of outliers. Only valid high-rate
values are used to compute this element";
```

// Significant waveheight – - ocean-2 (MLE3)

```
short swh_ocean_mle3(time);
      swh_ocean_mle3:_FillValue = 32767s;
      swh_ocean_mle3:long_name = "Ku band corrected significant waveheight (MLE3
retracking)";
      swh_ocean_mle3:standard_name = "sea_surface_wave_significant_height";
      swh_ocean_mle3:units = "m";
      swh_ocean_mle3:scale_factor = 1.00e-03;
      swh_ocean_mle3:coordinates = "/data_01/longitude /data_01/latitude";
      swh_ocean_mle3:quality_flag = "swh_ocean_mle3_compression_qual";
      swh_ocean_mle3:comment = "Named swh_ku_mle3 in GDR-D standard. All instrumental
corrections included, i.e. modeled instrumental errors correction
(swh_cor_ocean_mle3_model_instr) and system bias";

short swh_ocean_mle3_rms(time);
      swh_ocean_mle3_rms:_FillValue = 32767s;
      swh_ocean_mle3_rms:long_name = "RMS of the Ku band significant waveheight (MLE3
retracking)";
      swh_ocean_mle3_rms:units = "m";
      swh_ocean_mle3_rms:scale_factor = 1.00e-03;
      swh_ocean_mle3_rms:coordinates = "/data_01/longitude /data_01/latitude";
      swh_ocean_mle3_rms:comment = "Named swh_rms_ku_mle3 in GDR-D standard. Compression
of Ku band high rate elements is preceded by a detection of outliers. Only valid high-
rate values are used to compute this element";

byte swh_ocean_mle3_numval(time);
      swh_ocean_mle3_numval:_FillValue = 127b;
      swh_ocean_mle3_numval:long_name = "number of valid points used to compute Ku band
significant waveheight (MLE3 retracking)";
      swh_ocean_mle3_numval:units = "count";
      swh_ocean_mle3_numval:coordinates = "/data_01/longitude /data_01/latitude";
      swh_ocean_mle3_numval:valid_min = 0b;
      swh_ocean_mle3_numval:valid_max = 20b;
      swh_ocean_mle3_numval:comment = "Named swh_numval_ku_mle3 in GDR-D standard.
Compression of Ku band high rate elements is preceded by a detection of outliers. Only
valid high-rate values are used to compute this element";
```

// Significant waveheight – - adaptive

```
short swh_adaptive(time);
      swh_adaptive:_FillValue = 32767s;
      swh_adaptive:long_name = "Ku band corrected significant waveheight (adaptive
retracking)";
      swh_adaptive:standard_name = "sea_surface_wave_significant_height";
```

```
       swh_adaptive:units = "m";
       swh_adaptive:scale_factor = 1.00e-03;
       swh_adaptive:coordinates = "/data_01/longitude /data_01/latitude";
       swh_adaptive:quality_flag = "swh_adaptive_compression_qual";

short swh_adaptive_rms(time);
       swh_adaptive_rms:_FillValue = 32767s;
       swh_adaptive_rms:long_name = "RMS of the Ku band significant waveheight (adaptive
retracking)";
       swh_adaptive_rms:units = "m";
       swh_adaptive_rms:scale_factor = 1.00e-03;
       swh_adaptive_rms:coordinates = "/data_01/longitude /data_01/latitude";
       swh_adaptive_rms:comment = "Compression of Ku band high rate elements is preceded
by a detection of outliers. Only valid high-rate values are used to compute this
element";

byte swh_adaptive_numval(time);
       swh_adaptive_numval:_FillValue = 127b;
       swh_adaptive_numval:long_name = "number of valid points used to compute Ku band
significant waveheight (adaptive retracking)";
       swh_adaptive_numval:units = "count";
       swh_adaptive_numval:coordinates = "/data_01/longitude /data_01/latitude";
       swh_adaptive_numval:valid_min = 0b;
       swh_adaptive_numval:valid_max = 20b;
       swh_adaptive_numval:comment = "Compression of Ku band high rate elements is
preceded by a detection of outliers. Only valid high-rate values are used to compute this
element";
```

// Significant waveheight corrections

```
short swh_cor_ocean_net_instr(time);
       swh_cor_ocean_net_instr:_FillValue = 32767s;
       swh_cor_ocean_net_instr:long_name = "net instrumental correction on Ku band
significant waveheight";
       swh_cor_ocean_net_instr:units = "m";
       swh_cor_ocean_net_instr:scale_factor = 1.00e-03;
       swh_cor_ocean_net_instr:coordinates = "/data_01/longitude /data_01/latitude";
       swh_cor_ocean_net_instr:quality_flag = "swh_cor_ocean_net_instr_qual";
       swh_cor_ocean_net_instr:comment = "Named net_instr_corr_swh_ku in GDR-D standard.
Sum of modeled instrumental errors correction (swh_cor_ocean_model_instr) and system
bias";

short swh_cor_ocean_mle3_net_instr(time);
       swh_cor_ocean_mle3_net_instr:_FillValue = 32767s;
       swh_cor_ocean_mle3_net_instr:long_name = "net instrumental correction on Ku band
significant waveheight (MLE3 retracking)";
       swh_cor_ocean_mle3_net_instr:units = "m";
       swh_cor_ocean_mle3_net_instr:scale_factor = 1.00e-03;
       swh_cor_ocean_mle3_net_instr:coordinates = "/data_01/longitude /data_01/latitude";
       swh_cor_ocean_mle3_net_instr:comment = "Named net_instr_corr_swh_ku_mle3 in GDR-D
standard. Sum of modeled instrumental errors correction (swh_cor_ocean_mle3_model_instr)
and system bias";

short swh_cor_adaptive_net_instr(time);
       swh_cor_adaptive_net_instr:_FillValue = 32767s;
       swh_cor_adaptive_net_instr:long_name = "net instrumental correction on Ku band
significant waveheight (adaptive retracking)";
       swh_cor_adaptive_net_instr:units = "m";
       swh_cor_adaptive_net_instr:scale_factor = 1.00e-03;
       swh_cor_adaptive_net_instr:coordinates = "/data_01/longitude /data_01/latitude";
       swh_cor_adaptive_net_instr:comment = "Set to zero";
```

// Backscatter coefficient

```
short sig0_ocean(time);
       sig0_ocean:_FillValue = 32767s;
       sig0_ocean:long_name = "Ku band corrected backscatter coefficient";
       sig0_ocean:standard_name =
"surface_backwards_scattering_coefficient_of_radar_wave";
       sig0_ocean:units = "dB";
       sig0_ocean:scale_factor = 1.00e-02;
       sig0_ocean:coordinates = "/data_01/longitude /data_01/latitude";
       sig0_ocean:quality_flag = "sig0_ocean_compression_qual";
       sig0_ocean:comment = "Named sig0_ku in GDR-D standard. All instrumental
corrections included, excepted the system bias, i.e. AGC instrumental errors correction,
internal calibration correction (sig0_cor_calibration), modeled instrumental errors
correction (sig0_cor_ocean_model_instr) and atmospheric attenuation (sig0_cor_atm)";

short sig0_ocean_rms(time);
       sig0_ocean_rms:_FillValue = 32767s;
       sig0_ocean_rms:long_name = "RMS of the Ku band backscatter coefficient";
       sig0_ocean_rms:units = "dB";
       sig0_ocean_rms:scale_factor = 1.00e-02;
       sig0_ocean_rms:coordinates = "/data_01/longitude /data_01/latitude";
       sig0_ocean_rms:comment = "Named sig0_rms_ku in GDR-D standard. Compression of Ku
band high rate elements is preceded by a detection of outliers. Only valid high-rate
values are used to compute this element";

byte sig0_ocean_numval(time);
       sig0_ocean_numval:_FillValue = 127b;
       sig0_ocean_numval:long_name = "number of valid points used to compute Ku band
backscatter coefficient";
       sig0_ocean_numval:units = "count";
       sig0_ocean_numval:coordinates = "/data_01/longitude /data_01/latitude";
       sig0_ocean_numval:valid_min = 0b;
       sig0_ocean_numval:valid_max = 20b;
       sig0_ocean_numval:comment = "Named sig0_numval_ku in GDR-D standard";
```

// Backscatter coefficient – - ocean-2 (MLE3)

```
short sig0_ocean_mle3(time);
       sig0_ocean_mle3:_FillValue = 32767s;
       sig0_ocean_mle3:long_name = "Ku band corrected backscatter coefficient (MLE3
retracking)";
       sig0_ocean_mle3:standard_name =
"surface_backwards_scattering_coefficient_of_radar_wave";
       sig0_ocean_mle3:units = "dB";
       sig0_ocean_mle3:scale_factor = 1.00e-02;
       sig0_ocean_mle3:coordinates = "/data_01/longitude /data_01/latitude";
       sig0_ocean_mle3:quality_flag = "sig0_ocean_mle3_compression_qual";
       sig0_ocean_mle3:comment = "Named sig0_ku_mle3 in GDR-D standard. All instrumental
corrections included, excepted the system bias, i.e. AGC instrumental errors correction,
internal calibration correction (sig0_cor_calibration), modeled instrumental errors
correction (sig0_cor_ocean_mle3_model_instr) and atmospheric attenuation (sig0_cor_atm)";

short sig0_ocean_mle3_rms(time);
       sig0_ocean_mle3_rms:_FillValue = 32767s;
       sig0_ocean_mle3_rms:long_name = "RMS of the Ku band backscatter coefficient (MLE3
retracking)";
       sig0_ocean_mle3_rms:units = "dB";
       sig0_ocean_mle3_rms:scale_factor = 1.00e-02;
       sig0_ocean_mle3_rms:coordinates = "/data_01/longitude /data_01/latitude";
```

```
      sig0_ocean_mle3_rms:comment = "Named sig0_rms_ku_mle3 in GDR-D standard.
Compression of Ku band high rate elements is preceded by a detection of outliers. Only
valid high-rate values are used to compute this element";

byte sig0_ocean_mle3_numval(time);
      sig0_ocean_mle3_numval:_FillValue = 127b;
      sig0_ocean_mle3_numval:long_name = "number of valid points used to compute Ku band
backscatter coefficient (MLE3 retracking)";
      sig0_ocean_mle3_numval:units = "count";
      sig0_ocean_mle3_numval:coordinates = "/data_01/longitude /data_01/latitude";
      sig0_ocean_mle3_numval:valid_min = 0b;
      sig0_ocean_mle3_numval:valid_max = 20b;
      sig0_ocean_mle3_numval:comment = "Named sig0_numval_ku_mle3 in GDR-D standard";
```

// Backscatter coefficient – - adaptive

```
short sig0_adaptive(time);
      sig0_adaptive:_FillValue = 32767s;
      sig0_adaptive:long_name = "Ku band corrected backscatter coefficient (adaptive
retracking)";
      sig0_adaptive:standard_name =
"surface_backwards_scattering_coefficient_of_radar_wave";
      sig0_adaptive:units = "dB";
      sig0_adaptive:scale_factor = 1.00e-02;
      sig0_adaptive:coordinates = "/data_01/longitude /data_01/latitude";
      sig0_adaptive:quality_flag = "sig0_adaptive_compression_qual";
      sig0_adaptive:comment = "All instrumental corrections included, excepted the
system bias, i.e. AGC instrumental errors correction, internal calibration correction
(sig0_cor_calibration) and atmospheric attenuation (sig0_cor_atm)";

short sig0_adaptive_rms(time);
      sig0_adaptive_rms:_FillValue = 32767s;
      sig0_adaptive_rms:long_name = "RMS of the Ku band backscatter coefficient
(adaptive retracking)";
      sig0_adaptive_rms:units = "dB";
      sig0_adaptive_rms:scale_factor = 1.00e-02;
      sig0_adaptive_rms:coordinates = "/data_01/longitude /data_01/latitude";
      sig0_adaptive_rms:comment = "Compression of Ku band high rate elements is preceded
by a detection of outliers. Only valid high-rate values are used to compute this
element";

byte sig0_adaptive_numval(time);
      sig0_adaptive_numval:_FillValue = 127b;
      sig0_adaptive_numval:units = "count";
      sig0_adaptive_numval:long_name = "number of valid points used to compute Ku band
backscatter coefficient (adaptive retracking)";
      sig0_adaptive_numval:coordinates = "/data_01/longitude /data_01/latitude";
      sig0_adaptive_numval:valid_min = 0b;
      sig0_adaptive_numval:valid_max = 20b;
```

// Tracker AGC

```
short agc (time);
      agc:_FillValue = 32767s;
      agc:long_name = "Ku band corrected AGC";
      agc:units = "dB";
      agc:scale_factor = 1.00e-02;
      agc:coordinates = "/data_01/longitude /data_01/latitude";
      agc:comment = "Named agc_ku in GDR-D standard. AGC is corrected for instrumental
errors due to the imperfections of the on-board attenuators";
```

```
short agc_rms(time);
       agc_rms:_FillValue = 32767s;
       agc_rms:long_name = "RMS of the Ku band AGC";
       agc_rms:units = "dB";
       agc_rms:scale_factor = 1.00e-02;
       agc_rms:coordinates = "/data_01/longitude /data_01/latitude";
       agc_rms:comment = "Named agc_rms_ku in GDR-D standard. Compression of Ku band high
rate elements is preceded by a detection of outliers. Only valid high-rate values are
used to compute this element";

byte agc_numval(time);
       agc_numval:_FillValue = 127b;
       agc_numval:long_name = "number of valid points used to compute Ku band AGC";
       agc_numval:units = "count";
       agc_numval:coordinates = "/data_01/longitude /data_01/latitude";
       agc_numval:valid_min = 0b;
       agc_numval:valid_max = 20b;
       agc_numval:comment = "Named agc_numval_ku in GDR-D standard";
```

// Backscatter coefficient corrections

```
short sig0_cor_ocean_net_instr(time);
       sig0_cor_ocean_net_instr:_FillValue = 32767s;
       sig0_cor_ocean_net_instr:long_name = "net instrumental correction on Ku band
backscatter coefficient";
       sig0_cor_ocean_net_instr:units = "dB";
       sig0_cor_ocean_net_instr:scale_factor = 1.00e-02;
       sig0_cor_ocean_net_instr:coordinates = "/data_01/longitude /data_01/latitude";
       sig0_cor_ocean_net_instr:quality_flag = "sig0_cor_ocean_net_instr_qual";
       sig0_cor_ocean_net_instr:comment = "Named net_instr_corr_sig0_ku in GDR-D
standard. Sum of AGC instrumental errors correction, internal calibration correction
(sig0_cor_calibration) and modeled instrumental errors correction
(sig0_cor_ocean_model_instr) - system bias not included";

short sig0_cor_ocean_mle3_net_instr(time);
       sig0_cor_ocean_mle3_net_instr:_FillValue = 32767s;
       sig0_cor_ocean_mle3_net_instr:long_name = "net instrumental correction on Ku band
backscatter coefficient (MLE3 retracking)";
       sig0_cor_ocean_mle3_net_instr:units = "dB";
       sig0_cor_ocean_mle3_net_instr:scale_factor = 1.00e-02;
       sig0_cor_ocean_mle3_net_instr:coordinates = "/data_01/longitude
/data_01/latitude";
       sig0_cor_ocean_mle3_net_instr:comment = "Named net_instr_corr_sig0_ku_mle3 in GDR-
D standard. Sum of AGC instrumental errors correction, internal calibration correction
(sig0_cor_calibration) and modeled instrumental errors correction
(sig0_cor_ocean_mle3_model_instr) - system bias not included";

short sig0_cor_adaptive_net_instr(time);
       sig0_cor_adaptive_net_instr:_FillValue = 32767s;
       sig0_cor_adaptive_net_instr:long_name = "net instrumental correction on Ku band
backscatter coefficient (adaptive retracking)";
       sig0_cor_adaptive_net_instr:units = "dB";
       sig0_cor_adaptive_net_instr:scale_factor = 1.00e-023;
       sig0_cor_adaptive_net_instr:coordinates = "/data_01/longitude /data_01/latitude";
       sig0_cor_adaptive_net_instr:comment = "Sum of AGC instrumental errors correction,
internal calibration correction (sig0_cor_calibration) - system bias not included";

short sig0_cor_atm(time);
       sig0_cor_atm:_FillValue = 32767s;
       sig0_cor_atm:long_name = "atmospheric attenuation correction on Ku band
backscatter coefficient";
       sig0_cor_atm:units = "dB";
       sig0_cor_atm:scale_factor = 1.00e-02;
```

```
      sig0_cor_atm:coordinates = "/data_01/longitude /data_01/latitude";
      sig0_cor_atm:comment = "Named atmos_corr_sig0_ku in GDR-D standard. Based either
on the radiometer (if available) or atmospheric model (otherwise). The flag
sig0_cor_atm_source indicates whether the atmospheric model has been used.";
```

// Off nadir angle

```
short off_nadir_angle_wf_ocean(time);
      off_nadir_angle_wf_ocean:_FillValue = 32767s;
      off_nadir_angle_wf_ocean:long_name = "square of the off nadir angle computed from
Ku band waveforms";
      off_nadir_angle_wf_ocean:units = "degrees^2";
      off_nadir_angle_wf_ocean:scale_factor = 1.00e-04;
      off_nadir_angle_wf_ocean:coordinates = "/data_01/longitude /data_01/latitude";
      off_nadir_angle_wf_ocean:quality_flag =
"off_nadir_angle_wf_ocean_compression_qual";
      off_nadir_angle_wf_ocean:comment = "Named off_nadir_angle_wf_ku in GDR-D
standard";

short off_nadir_angle_wf_ocean_rms(time);
      off_nadir_angle_wf_ocean_rms:_FillValue = 32767s;
      off_nadir_angle_wf_ocean_rms:long_name = "RMS of the square of the off nadir angle
computed from Ku band waveforms";
      off_nadir_angle_wf_ocean_rms:units = "degrees^2";
      off_nadir_angle_wf_ocean_rms:scale_factor = 1.00e-04;
      off_nadir_angle_wf_ocean_rms:coordinates = "/data_01/longitude /data_01/latitude";
      off_nadir_angle_wf_ocean_rms:comment = "Named off_nadir_angle_wf_rms_ku in GDR-D
standard. Compression of high rate elements is preceded by a detection of outliers. Only
valid high-rate values are used to compute this element";

byte off_nadir_angle_wf_ocean_numval(time);
      off_nadir_angle_wf_ocean_numval:_FillValue = 127b;
      off_nadir_angle_wf_ocean_numval:long_name = "number of valid points for square of
the off nadir angle computed from Ku band waveforms";
      off_nadir_angle_wf_ocean_numval:units = "count";
      off_nadir_angle_wf_ocean_numval:coordinates = "/data_01/longitude
/data_01/latitude";
      off_nadir_angle_wf_ocean_numval:valid_min = 0b;
      off_nadir_angle_wf_ocean_numval:valid_max = 20b;
      off_nadir_angle_wf_ocean_numval:comment = "Named off_nadir_angle_wf_numval_ku in
GDR-D standard";
```

// Waveforms characteristics

```
byte wvf_main_class(time);
      wvf_main_class:_FillValue = 127b;
      wvf_main_class:long_name = "1 Hz Ku band waveform main class";
      wvf_main_class:flag_meanings = "brown_ocean peaky noise strong_peak
brown_peak_trailing_edge brown_peak_leading_edge brown_flat_trailing_eadge peak_end trash
brown_noise two_leading_edges shifted_brown brown_noise_leading_edge
linear_positive_slope linear_negative_slope";
      wvf_main_class:flag_values = 1b, 2b, 3b, 4b, 5b, 6b, 7b, 8b, 9b, 10b, 11b, 12b,
13b, 15b, 18b;
      wvf_main_class:coordinates = "/data_01/longitude /data_01/latitude";
      wvf_main_class:comment = "Waveform classification : main class selected by
classification neural network trained on shape features of the waveforms";
```

// Sea Surface height

```
short ssha(time);
       ssha:_FillValue = 32767s;
       ssha:long_name = "sea surface height anomaly";
       ssha:standard_name = "sea_surface_height_above_sea_level";
       ssha:source = "Poseidon-3B";
       ssha:institution = "CNES";
       ssha:units = "m";
       ssha:scale_factor = 1.00e-03;
       ssha:coordinates = "/data_01/longitude /data_01/latitude";
       ssha:comment = "= altitude of satellite (/data_01/altitude) - Ku band corrected
altimeter range (range_ocean) - filtered altimeter ionospheric correction on Ku band
(iono_cor_alt_filtered) - model dry tropospheric correction
(/data_01/model_dry_tropo_cor_zero_altitude) - radiometer wet tropospheric correction
(/data_01/rad_wet_tropo_cor) - sea state bias correction in Ku band (sea_state_bias) -
solid earth tide height (/data_01/solid_earth_tide) – - geocentric ocean tide height from
FES solution (/data_01/ocean_tide_fes) - non-equilibrium long-period ocean tide height
(/data_01/ocean_tide_non_eq) - geocentric pole tide height (/data_01/pole_tide) -
internal tide (/data_01/internal_tide) - dynamic atmospheric correction (/data_01/dac) -
mean sea surface from CNES/CLS solution (/data_01/mean_sea_surface_cnescls). Set to
default if the waveform classification (wvf_main_class) is not set to 1 = brown ocean, 12
= shifted brown, 13 = brown noise leading edge or 15 = linear positive_slope, the
radiometer surface type (/data_01/rad_surface_type_flag) set to 2 = land";

short ssha_mle3(time);
       ssha_mle3:_FillValue = 32767s;
       ssha_mle3:long_name = "sea surface height anomaly (MLE3 retracking)";
       ssha_mle3:standard_name = "sea_surface_height_above_sea_level";
       ssha_mle3:source = "Poseidon-3B";
       ssha_mle3:institution = "CNES";
       ssha_mle3:units = "m";
       ssha_mle3:scale_factor = 1.00e-03;
       ssha_mle3:coordinates = "/data_01/longitude /data_01/latitude";
       ssha_mle3:comment = "= altitude of satellite (/data_01/altitude) - Ku band
corrected altimeter range (range_ocean_mle3) - filtered altimeter ionospheric correction
on Ku band (iono_cor_alt_filtered_mle3) - model dry tropospheric correction
(/data_01/model_dry_tropo_cor_zero_altitude) - radiometer wet tropospheric correction
(/data_01/rad_wet_tropo_cor) - sea state bias correction in Ku band (sea_state_bias_mle3)
- solid earth tide height (/data_01/solid_earth_tide) - geocentric ocean tide height from
FES solution (/data_01/ocean_tide_fes) - non-equilibrium long-period ocean tide height
(/data_01/ocean_tide_non_eq) - geocentric pole tide height (/data_01/pole_tide) -
internal tide (/data_01/internal_tide) - dynamic atmospheric correction (/data_01/dac) -
mean sea surface from CNES/CLS solution (/data_01/mean_sea_surface_cnescls). Set to
default if the waveform classification (wvf_main_class) is not set to 1 = brown ocean, 12
= shifted brown, 13 = brown noise leading edge or 15 = linear positive_slope, the
radiometer surface type (/data_01/rad_surface_type_flag) set to 2 = land";

} // group: ku
```

// 1-Hz C band data

```
group: c {

  variables:
```

// Quality information and sensor status

// Altimeter state flags

```
byte alt_state_c_band_flag(time);
       alt_state_c_band_flag:_FillValue = 127b;
       alt_state_c_band_flag:long_name = "altimeter state flag: C bandwidth used";
```

```
       alt_state_c_band_flag:flag_meanings = "320MHz 100MHz";
       alt_state_c_band_flag:flag_values = 0b, 1b;
       alt_state_c_band_flag:coordinates = "/data_01/longitude /data_01/latitude";
       alt_state_c_band_flag:comment = "Named alt_state_flag_c_band in GDR-D standard";

byte alt_state_band_status_flag(time);
       alt_state_band_status_flag:_FillValue = 127b;
       alt_state_band_status_flag:long_name = "altimeter state flag: C band status";
       alt_state_band_status_flag:flag_meanings = "On Off";
       alt_state_band_status_flag:flag_values = 0b, 1b;
       alt_state_band_status_flag:coordinates = "/data_01/longitude /data_01/latitude";
       alt_state_band_status_flag:comment = "Named alt_state_flag_c_band_status in GDR-D
standard";

                // Quality flags for 1Hz altimeter data
byte range_ocean_compression_qual(time);
       range_ocean_compression_qual:_FillValue = 127b;
       range_ocean_compression_qual:long_name = "quality flag for 1 Hz altimeter data: C
band range";
       range_ocean_compression_qual:flag_meanings = "good bad";
       range_ocean_compression_qual:flag_values = 0b, 1b;
       range_ocean_compression_qual:coordinates = "/data_01/longitude /data_01/latitude";
       range_ocean_compression_qual:comment = "Named qual_alt_1hz_range_c in GDR-D
standard";

byte swh_ocean_compression_qual(time);
       swh_ocean_compression_qual:_FillValue = 127b;
       swh_ocean_compression_qual:long_name = "quality flag for 1 Hz altimeter data: C
band SWH";
       swh_ocean_compression_qual:flag_meanings = "good bad";
       swh_ocean_compression_qual:flag_values = 0b, 1b;
       swh_ocean_compression_qual:coordinates = "/data_01/longitude /data_01/latitude";
       swh_ocean_compression_qual:comment = "Named qual_alt_1hz_swh_c in GDR-D standard";

byte sig0_ocean_compression_qual(time);
       sig0_ocean_compression_qual:_FillValue = 127b;
       sig0_ocean_compression_qual:long_name = "quality flag for 1 Hz altimeter data: C
band backscatter coefficient";
       sig0_ocean_compression_qual:flag_meanings = "good bad";
       sig0_ocean_compression_qual:flag_values = 0b, 1b;
       sig0_ocean_compression_qual:coordinates = "/data_01/longitude /data_01/latitude";
       sig0_ocean_compression_qual:comment = "Named qual_alt_1hz_sig0_c in GDR-D
standard";

                // Quality flags for 1 Hz altimeter instrumental corrections

byte range_cor_ocean_net_instr_qual(time);
       range_cor_ocean_net_instr_qual:_FillValue = 127b;
       range_cor_ocean_net_instr_qual:long_name = "quality flag for 1 Hz instrumental
correction: C band range";
       range_cor_ocean_net_instr_qual:flag_meanings = "good bad";
       range_cor_ocean_net_instr_qual:flag_values = 0b, 1b;
       range_cor_ocean_net_instr_qual:coordinates = "/data_01/longitude
/data_01/latitude";
       range_cor_ocean_net_instr_qual:comment = "Named qual_inst_corr_1hz_range_c in GDR-
D standard. Threshold control of range_cor_ocean_net_instr";

byte swh_cor_ocean_net_instr_qual(time);
       swh_cor_ocean_net_instr_qual:_FillValue = 127b;
       swh_cor_ocean_net_instr_qual:long_name = "quality flag for 1 Hz instrumental
correction: C band SWH";
       swh_cor_ocean_net_instr_qual:flag_meanings = "good bad";
```

```
      swh_cor_ocean_net_instr_qual:flag_values = 0b, 1b;
      swh_cor_ocean_net_instr_qual:coordinates = "/data_01/longitude /data_01/latitude";
      swh_cor_ocean_net_instr_qual:comment = "Named qual_inst_corr_1hz_swh_c in GDR-D
standard. Threshold control of swh_cor_ocean_net_instr";

byte sig0_cor_ocean_net_instr_qual(time);
      sig0_cor_ocean_net_instr_qual:_FillValue = 127b;
      sig0_cor_ocean_net_instr_qual:long_name = "quality flag for 1 Hz instrumental
correction: C band backscatter coefficient";
      sig0_cor_ocean_net_instr_qual:flag_meanings = "good bad";
      sig0_cor_ocean_net_instr_qual:flag_values = 0b, 1b;
      sig0_cor_ocean_net_instr_qual:coordinates = "/data_01/longitude
/data_01/latitude";
      sig0_cor_ocean_net_instr_qual:comment = "Named qual_inst_corr_1hz_sig0_c in GDR-D
standard. Threshold control of sig0_cor_ocean_net_instr";
```

// Altimeter range

```
int range_ocean(time);
      range_ocean:_FillValue = 2147483647;
      range_ocean:long_name = "1 Hz C band corrected altimeter range";
      range_ocean:standard_name = "altimeter_range";
      range_ocean:units = "m";
      range_ocean:add_offset = 1.300000e+06;
      range_ocean:scale_factor = 1.00e-04;
      range_ocean:coordinates = "/data_01/longitude /data_01/latitude";
      range_ocean:quality_flag = "range_ocean_compression_qual";
      range_ocean:comment = "Named range_c in GDR-D standard. All instrumental
corrections included, i.e. distance antenna-COG (/data_01/range_cor_cog), USO drift
correction (/data_01/range_cor_uso), internal path correction (range_cor_internal_path),
Doppler correction (range_cor_doppler), modeled instrumental errors correction
(range_cor_ocean_model_instr) and system bias";

short range_ocean_rms(time);
      range_ocean_rms:_FillValue = 32767s;
      range_ocean_rms:long_name = "RMS of the C band range";
      range_ocean_rms:units = "m";
      range_ocean_rms:scale_factor = 1.00e-04;
      range_ocean_rms:coordinates = "/data_01/longitude /data_01/latitude";
      range_ocean_rms:comment = "Named range_rms_c in GDR-D standard. Compression of C
band high rate elements is preceded by a detection of outliers. Only valid high-rate
values are used to compute this element";

byte range_ocean_numval(time);
      range_ocean_numval:_FillValue = 127b;
      range_ocean_numval:long_name = "number of valid points for C band range";
      range_ocean_numval:units = "count";
      range_ocean_numval:coordinates = "/data_01/longitude /data_01/latitude";
      range_ocean_numval:valid_min = 0b;
      range_ocean_numval:valid_max = 20b;
      range_ocean_numval:comment = "Named range_numval_c in GDR-D standard";
```

// Altimeter range corrections

```
int range_cor_ocean_net_instr(time);
      range_cor_ocean_net_instr:_FillValue = 2147483647;
      range_cor_ocean_net_instr:long_name = "net instrumental correction on the C band
range";
      range_cor_ocean_net_instr:units = "m";
      range_cor_ocean_net_instr:scale_factor = 1.00e-04;
      range_cor_ocean_net_instr:coordinates = "/data_01/longitude /data_01/latitude";
```

```
      range_cor_ocean_net_instr:quality_flag = "range_cor_ocean_net_instr_qual";
      range_cor_ocean_net_instr:comment = "Named net_instr_corr_range_c in GDR-D
standard. Sum of distance antenna-COG (/data_01/range_cor_cog), USO drift correction
(/data_01/range_cor_uso), internal path correction (range_cor_internal_path), Doppler
correction (range_cor_doppler), modeled instrumental errors correction
(range_cor_ocean_model_instr) and system bias";

short sea_state_bias(time);
      sea_state_bias:_FillValue = 32767s;
      sea_state_bias:long_name = "sea state bias correction in C band";
      sea_state_bias:standard_name =
"sea_surface_height_bias_due_to_sea_surface_roughness";
      sea_state_bias:source = < ssb_source >;
      sea_state_bias:institution = < ssb_institution >;
      sea_state_bias:units = "m";
      sea_state_bias:scale_factor = 1.00e-04;
      sea_state_bias:coordinates = "/data_01/longitude /data_01/latitude";
      sea_state_bias:comment = "Named sea_state_bias_c in GDR-D standard. A sea state
bias correction must be added (negative value) to the instrument range to correct this
range measurement for sea state delays of the radar pulse. This element should not be
used over land. See Jason-3 User Handbook";

short sea_state_bias_mle3(time);
      sea_state_bias_mle3:_FillValue = 32767s;
      sea_state_bias_mle3:long_name = "sea state bias correction in C band (MLE3
retracking)";
      sea_state_bias_mle3:standard_name =
"sea_surface_height_bias_due_to_sea_surface_roughness";
      sea_state_bias_mle3:source = < ssb_mle3_source >;
      sea_state_bias_mle3:institution = < ssb_mle3_institution >;
      sea_state_bias_mle3:units = "m";
      sea_state_bias_mle3:scale_factor = 1.00e-04;
      sea_state_bias_mle3:coordinates = "/data_01/longitude /data_01/latitude";
      sea_state_bias_mle3:comment = "Named sea_state_bias_c_mle3 in GDR-D standard. A
sea state bias correction must be added (negative value) to the instrument range to
correct this range measurement for sea state delays of the radar pulse. This element
should not be used over land. See Jason-3 User Handbook";

short sea_state_bias_adaptive(time);
      sea_state_bias_adaptive:_FillValue = 32767s;
      sea_state_bias_adaptive:long_name = "sea state bias correction in C band (adaptive
retracking)";
      sea_state_bias_adaptive:standard_name =
"sea_surface_height_bias_due_to_sea_surface_roughness";
      sea_state_bias_adaptive:source = < ssb_adaptive_source >;
      sea_state_bias_adaptive:institution = < ssb_adaptive_institution >;
      sea_state_bias_adaptive:units = "m";
      sea_state_bias_adaptive:scale_factor = 1.00e-04;
      sea_state_bias_adaptive:coordinates = "/data_01/longitude /data_01/latitude";
      sea_state_bias_adaptive:comment = "A sea state bias correction must be added
(negative value) to the instrument range to correct this range measurement for sea state
delays of the radar pulse. This element should not be used over land. See Jason-3 User
Handbook";
```

// Significant waveheight

```
short swh_ocean(time);
      swh_ocean:_FillValue = 32767s;
      swh_ocean:long_name = "C band corrected significant waveheight";
      swh_ocean:standard_name = "sea_surface_wave_significant_height";
      swh_ocean:units = "m";
      swh_ocean:scale_factor = 1.00e-03;
      swh_ocean:coordinates = "/data_01/longitude /data_01/latitude";
```

```
       swh_ocean:quality_flag = "swh_ocean_compression_qual";
       swh_ocean:comment = "Named swh_c in GDR-D standard. All instrumental corrections
included, i.e. modeled instrumental errors correction (swh_cor_ocean_model_instr) and
system bias";

short swh_ocean_rms(time);
       swh_ocean_rms:_FillValue = 32767s;
       swh_ocean_rms:long_name = "RMS of the C band significant waveheight";
       swh_ocean_rms:units = "m";
       swh_ocean_rms:scale_factor = 1.00e-03;
       swh_ocean_rms:coordinates = "/data_01/longitude /data_01/latitude";
       swh_ocean_rms:comment = "Named swh_rms_c in GDR-D standard. Compression of C band
high rate elements is preceded by a detection of outliers. Only valid high-rate values
are used to compute this element";

byte swh_ocean_numval(time);
       swh_ocean_numval:_FillValue = 127b;
       swh_ocean_numval:long_name = "number of valid points used to compute C band
significant waveheight";
       swh_ocean_numval:units = "count";
       swh_ocean_numval:coordinates = "/data_01/longitude /data_01/latitude";
       swh_ocean_numval:valid_min = 0b;
       swh_ocean_numval:valid_max = 20b;
       swh_ocean_numval:comment = "Named swh_numval_c in GDR-D standard. Compression of C
band high rate elements is preceded by a detection of outliers. Only valid high-rate
values are used to compute this element";
```

// Significant waveheight corrections

```
short swh_cor_ocean_net_instr(time);
       swh_cor_ocean_net_instr:_FillValue = 32767s;
       swh_cor_ocean_net_instr:long_name = "net instrumental correction on C band
significant waveheight";
       swh_cor_ocean_net_instr:units = "m";
       swh_cor_ocean_net_instr:scale_factor = 1.00e-03;
       swh_cor_ocean_net_instr:coordinates = "/data_01/longitude /data_01/latitude";
       swh_cor_ocean_net_instr:quality_flag = "swh_cor_ocean_net_instr_qual";
       swh_cor_ocean_net_instr:comment = "Named net_instr_corr_swh_c in GDR-D standard.
Sum of modeled instrumental errors correction (swh_cor_ocean_model_instr) and system
bias";
```

// Backscatter coefficient

```
short sig0_ocean(time);
       sig0_ocean:_FillValue = 32767s;
       sig0_ocean:long_name = "C band corrected backscatter coefficient";
       sig0_ocean:standard_name =
"surface_backwards_scattering_coefficient_of_radar_wave";
       sig0_ocean:units = "dB";
       sig0_ocean:scale_factor = 1.00e-02;
       sig0_ocean:coordinates = "/data_01/longitude /data_01/latitude";
       sig0_ocean:quality_flag = "sig0_ocean_compression_qual";
       sig0_ocean:comment = "Named sig0_c in GDR-D standard. All instrumental corrections
included, excepted the system bias, i.e. AGC instrumental errors correction, internal
calibration correction (sig0_cor_calibration), modeled instrumental errors correction
(sig0_cor_ocean_model_instr) and atmospheric attenuation (sig0_cor_atm)";

short sig0_ocean_rms(time);
       sig0_ocean_rms:_FillValue = 32767s;
       sig0_ocean_rms:long_name = "RMS of the C band backscatter coefficient";
       sig0_ocean_rms:units = "dB";
```

```
       sig0_ocean_rms:scale_factor = 1.00e-02;
       sig0_ocean_rms:coordinates = "/data_01/longitude /data_01/latitude";
       sig0_ocean_rms:comment = "Named sig0_rms_c in GDR-D standard. Compression of C
band high rate elements is preceded by a detection of outliers. Only valid high-rate
values are used to compute this element";

byte sig0_ocean_numval(time);
       sig0_ocean_numval:_FillValue = 127b;
       sig0_ocean_numval:long_name = "number of valid points used to compute C band
backscatter coefficient";
       sig0_ocean_numval:units = "count";
       sig0_ocean_numval:coordinates = "/data_01/longitude /data_01/latitude";
       sig0_ocean_numval:valid_min = 0b;
       sig0_ocean_numval:valid_max = 20b;
       sig0_ocean_numval:comment = "Named sig0_numval_c in GDR-D standard";
```

// Tracker AGC

```
short agc(time);
       agc:_FillValue = 32767s;
       agc:long_name = "C band corrected AGC";
       agc:units = "dB";
       agc:scale_factor = 1.00e-02;
       agc:coordinates = "/data_01/longitude /data_01/latitude";
       agc:comment = "Named agc_c in GDR-D standard. AGC is corrected for instrumental
errors due to the imperfections of the on-board attenuators";

short agc_rms(time);
       agc_rms:_FillValue = 32767s;
       agc_rms:long_name = "RMS of the C band AGC";
       agc_rms:units = "dB";
       agc_rms:scale_factor = 1.00e-02;
       agc_rms:coordinates = "/data_01/longitude /data_01/latitude";
       agc_rms:comment = "Named agc_rms_c in GDR-D standard. Compression of C band high
rate elements is preceded by a detection of outliers. Only valid high-rate values are
used to compute this element";

byte agc_numval(time);
       agc_numval:_FillValue = 127b;
       agc_numval:long_name = "number of valid points used to compute C band AGC";
       agc_numval:units = "count";
       agc_numval:coordinates = "/data_01/longitude /data_01/latitude";
       agc_numval:valid_min = 0b;
       agc_numval:valid_max = 20b;
       agc_numval:comment = "Named agc_numval_c in GDR-D standard";
```

// Backscatter coefficient corrections

```
short sig0_cor_ocean_net_instr(time);
       sig0_cor_ocean_net_instr:_FillValue = 32767s;
       sig0_cor_ocean_net_instr:long_name = "net instrumental correction on C band
backscatter coefficient";
       sig0_cor_ocean_net_instr:units = "dB";
       sig0_cor_ocean_net_instr:scale_factor = 1.00e-02;
       sig0_cor_ocean_net_instr:coordinates = "/data_01/longitude /data_01/latitude";
       sig0_cor_ocean_net_instr:quality_flag = "sig0_cor_ocean_net_instr_qual";
       sig0_cor_ocean_net_instr:comment = "Named net_instr_corr_sig0_c in GDR-D standard.
Sum of AGC instrumental errors correction, internal calibration correction
(sig0_cor_calibration) and modeled instrumental errors correction
(sig0_cor_ocean_model_instr) - system bias not included";
```

```
short sig0_cor_atm(time);
       sig0_cor_atm:_FillValue = 32767s;
       sig0_cor_atm:long_name = "atmospheric attenuation correction on C band backscatter
coefficient";
       sig0_cor_atm:units = "dB";
       sig0_cor_atm:scale_factor = 1.00e-02;
       sig0_cor_atm:coordinates = "/data_01/longitude /data_01/latitude";
       sig0_cor_atm:comment = "Named atmos_corr_sig0_c in GDR-D standard";

} // group: c

} // group: data_01
```

// 20-Hz data

```
group: data_20 {

  dimensions:
    time = < number of measurements >;

  variables:
```

// Time Tag

```
double time(time);
       time:long_name = "time 20 Hz in UTC";
       time:standard_name = "time";
       time:calendar = "gregorian";
       time:tai_utc_difference = < Value of TAI-UTC at time of first record >;
       time:leap_second = < UTC time of the leap second (YYYY-MM-DD hh:mm:ss) >;
       time:units = "seconds since 2000-01-01 00:00:00.0";
       time:comment = "Named time_20hz in GDR-D standard. Time of measurement in seconds
in the UTC time scale since 1 Jan 2000 00:00:00 UTC. [tai_utc_difference] is the
difference between TAI and UTC reference time (seconds) for the first measurement of the
data set. If a leap second occurs within the data set, the attribute [leap_second] is set
to the UTC time at which the leap second occurs.";

double time_tai(time);
       time_tai:_FillValue = 18446744073709551616.000000;
       time_tai:long_name = "time 20 Hz in TAI";
       time_tai:standard_name = "time";
       time_tai:calendar = "gregorian";
       time_tai:units = "seconds since 2000-01-01 00:00:00.0";
       time_tai:comment = "Time of measurement in seconds in the TAI time scale since 1
Jan 2000 00:00:00 TAI. This time scale contains no leap seconds. The difference (in
seconds) with time in UTC is given by the attribute [time:tai_utc_difference].";

int index_1hz_measurement(time);
       index_1hz_measurement:_FillValue = 2147483647;
       index_1hz_measurement:long_name = "record counter of the associated 1 Hz
measurement";
       index_1hz_measurement:coordinates = "longitude latitude";
       index_1hz_measurement:comment = "Record counter of the averaged 1 Hz measurement
associated to the 20 Hz elementary measurement";
```

// Location and surface type

```
int latitude(time);
       latitude:_FillValue = 2147483647;
```

```
        latitude:long_name = "20 Hz latitude";
        latitude:standard_name = "latitude";
        latitude:units = "degrees_north";
        latitude:scale_factor = 1.00e-06;
        latitude:comment = "Named lat_20hz in GDR-D standard. Positive latitude is North
latitude, negative latitude is South latitude. See Jason-3 User Handbook";

int longitude(time);
        longitude:_FillValue = 2147483647;
        longitude:long_name = "20 Hz longitude";
        longitude:standard_name = "longitude";
        longitude:units = "degrees_east";
        longitude:scale_factor = 1.00e-06;
        longitude:comment = "Named lon_20hz in GDR-D standard. East longitude relative to
Greenwich meridian. See Jason-3 User Handbook";

byte surface_classification_flag(time);
        surface_classification_flag:_FillValue = 127b;
        surface_classification_flag:long_name = "20 Hz surface classification";
        surface_classification_flag:flag_meanings = "open_ocean land continental_water
aquatic_vegetation continental_ice_snow floating_ice salted_basin";
        surface_classification_flag:flag_values = 0b, 1b, 2b, 3b, 4b, 5b, 6b;
        surface_classification_flag:coordinates = "longitude latitude";
        surface_classification_flag:comment = "Computed from a mask built with MODIS and
GlobCover data";

short angle_of_approach_to_coast(time);
        angle_of_approach_to_coast:_FillValue = 32767s;
        angle_of_approach_to_coast:long_name = "20 Hz angle of approach to the coast";
        angle_of_approach_to_coast:units = "degrees";
        angle_of_approach_to_coast:scale_factor = 1.00e-02;
        angle_of_approach_to_coast:coordinates = "longitude latitude";
        angle_of_approach_to_coast:comment = "Angle of approach to the closest coast. 0 is
parallel to the coast with the land on the right. Positive values indicate the satellite
is approaching the land. Negative values indicate the satellite is leaving the land.
Values close to +/-180 degrees have the land on the left";

int distance_to_coast(time);
        distance_to_coast:_FillValue = 2147483647;
        distance_to_coast:long_name = "20 Hz distance to the coast";
        distance_to_coast:units = "m";
        distance_to_coast:coordinates = "longitude latitude";
```

// Quality information and sensor status

```
        // Altimeter state flags

byte alt_state_acq_mode_flag(time);
        alt_state_acq_mode_flag:_FillValue = 127b;
        alt_state_acq_mode_flag:long_name = "20 Hz altimeter state flag: operational
acquisition mode";
        alt_state_acq_mode_flag:flag_meanings = "autonomous_acq/track
autonomous_DIODEacq/track DIODE+DEM/track";
        alt_state_acq_mode_flag:flag_values = 8b, 9b, 10b;
        alt_state_acq_mode_flag:coordinates = "longitude latitude";
        alt_state_acq_mode_flag:comment = "Named alt_state_flag_acq_mode_20hz in GDR-D
standard. 8 = autonomous acquisition / tracking, 9 = autonomous DIODE acquisition /
tracking, 10 = DIODE + Digital Elevation Model tracking";

byte alt_state_track_trans_flag(time);
        alt_state_track_trans_flag:_FillValue = 127b;
```

```
      alt_state_track_trans_flag:long_name = "20 Hz altimeter state flag: tracking
automatic transition";
      alt_state_track_trans_flag:flag_meanings = "authorized inhibited";
      alt_state_track_trans_flag:flag_values = 0b, 1b;
      alt_state_track_trans_flag:coordinates = "longitude latitude";
      alt_state_track_trans_flag:comment = "Named alt_state_flag_track_trans_20hz in
GDR-D standard";

      // Quality flags for interpolation

byte meteo_measurement_altitude_interp_qual(time);
      meteo_measurement_altitude_interp_qual:_FillValue = 127b;
      meteo_measurement_altitude_interp_qual:long_name = "20 Hz meteorological data at
measurement altitude interpolation flag";
      meteo_measurement_altitude_interp_qual:flag_meanings = "good bad";
      meteo_measurement_altitude_interp_qual:flag_values = 0b, 1b;
      meteo_measurement_altitude_interp_qual:coordinates = "longitude latitude";
      meteo_measurement_altitude_interp_qual:comment = "0 = interpolation from 4 points;
1 = interpolation from less than 4 points";

// Orbit

int altitude(time);
      altitude:_FillValue = 2147483647;
      altitude:long_name = "20 Hz altitude of satellite";
      altitude:standard_name = "height_above_reference_ellipsoid";
      altitude:units = "m";
      altitude:add_offset = 1.300000e+06;
      altitude:scale_factor = 1.00e-04;
      altitude:coordinates = "longitude latitude";
      altitude:comment = "Named alt in GDR-D standard. Altitude of satellite above the
reference ellipsoid";

// Altimeter range corrections

short model_dry_tropo_cor_measurement_altitude(time);
      model_dry_tropo_cor_measurement_altitude:_FillValue = 32767s;
      model_dry_tropo_cor_measurement_altitude:long_name = "20 Hz model dry tropospheric
correction at measurement altitude";
      model_dry_tropo_cor_measurement_altitude:standard_name =
"altimeter_range_correction_due_to_dry_troposphere";
      model_dry_tropo_cor_measurement_altitude:source = "European Center for Medium
Range Weather Forecasting";
      model_dry_tropo_cor_measurement_altitude:institution = "ECMWF";
      model_dry_tropo_cor_measurement_altitude:units = "m";
      model_dry_tropo_cor_measurement_altitude:scale_factor = 1.00e-04;
      model_dry_tropo_cor_measurement_altitude:coordinates = "longitude latitude";
      model_dry_tropo_cor_measurement_altitude:quality_flag =
"meteo_measurement_altitude_interp_qual";
      model_dry_tropo_cor_measurement_altitude:comment = "Computed from 3d
meteorological fields at measurement altitude, at the altimeter time-tag from the
interpolation of 2 meteorological fields that surround the altimeter time-tag. A dry
tropospheric correction must be added (negative value) to the instrument range to correct
this range measurement for dry tropospheric range delays of the radar pulse. See Jason-3
User Handbook";

short model_wet_tropo_cor_measurement_altitude(time);
      model_wet_tropo_cor_measurement_altitude:_FillValue = 32767s;
      model_wet_tropo_cor_measurement_altitude:long_name = "20 Hz model wet tropospheric
correction at measurement altitude";
```

```
      model_wet_tropo_cor_measurement_altitude:standard_name =
"altimeter_range_correction_due_to_wet_troposphere";
      model_wet_tropo_cor_measurement_altitude:source = "European Center for Medium
Range Weather Forecasting";
      model_wet_tropo_cor_measurement_altitude:institution = "ECMWF";
      model_wet_tropo_cor_measurement_altitude:units = "m";
      model_wet_tropo_cor_measurement_altitude:scale_factor = 1.00e-04;
      model_wet_tropo_cor_measurement_altitude:coordinates = "longitude latitude";
      model_wet_tropo_cor_measurement_altitude:quality_flag =
"meteo_measurement_altitude_interp_qual";
      model_wet_tropo_cor_measurement_altitude:comment = "Computed from 3d
meteorological fields at measurement altitude, at the altimeter time-tag from the
interpolation of 2 meteorological fields that surround the altimeter time-tag. A wet
tropospheric correction must be added (negative value) to the instrument range to correct
this range measurement for wet tropospheric range delays of the radar pulse. See Jason-3
User Handbook";

int surface_slope_cor(time);
      surface_slope_cor:_FillValue = 2147483647;
      surface_slope_cor:long_name = "surface slope correction";
      surface_slope_cor:source = < surface_slope_cor_source >;
      surface_slope_cor:units = "m";
      surface_slope_cor:scale_factor = 1.00e-04;
      surface_slope_cor:coordinates = "longitude latitude";
      surface_slope_cor:comment = "The surface slope correction shall not be used with
the mean sea surface (mean_sea_surface_cnescls or mean_sea_surface_dtu) provided in the
product. See Jason-3 User Handbook";
```

// 20-Hz Ku band data

```
group: ku {

  variables:
```

// Altimeter range

```
int range_ocean(time);
      range_ocean:_FillValue = 2147483647;
      range_ocean:long_name = "20 Hz Ku band corrected altimeter range";
      range_ocean:standard_name = "altimeter_range";
      range_ocean:units = "m";
      range_ocean:add_offset = 1.300000e+06;
      range_ocean:scale_factor = 1.00e-04;
      range_ocean:coordinates = "/data_20/longitude /data_20/latitude";
      range_ocean:comment = "Named range_20hz_ku in GDR-D standard. All instrumental
corrections included, i.e. distance antenna-COG (/data_01/range_cor_cog), USO drift
correction (/data_01/range_cor_uso), internal path correction
(/data_01/ku/range_cor_internal_path), Doppler correction
(/data_01/ku/range_cor_doppler), modeled instrumental errors correction
(/data_01/ku/range_cor_ocean_model_instr) and system bias";

byte range_ocean_compression_qual(time);
      range_ocean_compression_qual:_FillValue = 127b;
      range_ocean_compression_qual:long_name = "20 Hz flag for utilization in the
computation of 1 Hz Ku band range";
      range_ocean_compression_qual:flag_meanings = "yes no";
      range_ocean_compression_qual:flag_values = 0b, 1b;
      range_ocean_compression_qual:coordinates = "/data_20/longitude /data_20/latitude";
      range_ocean_compression_qual:comment = "Named range_used_20hz_ku in GDR-D
standard. Map of valid points used to compute the 1 Hz Ku band altimeter range";
```

// Altimeter range – - ocean-2 (MLE3)

```
int range_ocean_mle3(time);
       range_ocean_mle3:_FillValue = 2147483647;
       range_ocean_mle3:long_name = "20 Hz Ku band corrected altimeter range (MLE3
retracking)";
       range_ocean_mle3:standard_name = "altimeter_range";
       range_ocean_mle3:units = "m";
       range_ocean_mle3:add_offset = 1.300000e+06;
       range_ocean_mle3:scale_factor = 1.00e-04;
       range_ocean_mle3:coordinates = "/data_20/longitude /data_20/latitude";
       range_ocean_mle3:comment = "Named range_20hz_ku_mle3 in GDR-D standard. All
instrumental corrections included, i.e. distance antenna-COG (/data_01/range_cor_cog),
USO drift correction (/data_01/range_cor_uso), internal path correction
(/data_01/ku/range_cor_internal_path), Doppler correction
(/data_01/ku/range_cor_doppler), modeled instrumental errors correction
(/data_01/ku/range_cor_ocean_mle3_model_instr) and system bias";

byte range_ocean_mle3_compression_qual(time);
       range_ocean_mle3_compression_qual:_FillValue = 127b;
       range_ocean_mle3_compression_qual:long_name = "20 Hz flag for utilization in the
computation of 1 Hz Ku band range (MLE3 retracking)";
       range_ocean_mle3_compression_qual:flag_meanings = "yes no";
       range_ocean_mle3_compression_qual:flag_values = 0b, 1b;
       range_ocean_mle3_compression_qual:coordinates = "/data_20/longitude
/data_20/latitude";
       range_ocean_mle3_compression_qual:comment = "Named range_used_20hz_ku_mle3 in GDR-
D standard. Map of valid points used to compute the 1 Hz Ku band altimeter range";
```

// Altimeter range – - adaptive

```
int range_adaptive(time);
       range_adaptive:_FillValue = 2147483647;
       range_adaptive:long_name = "20 Hz Ku band corrected altimeter range (adaptive
retracking)";
       range_adaptive:standard_name = "altimeter_range";
       range_adaptive:units = "m";
       range_adaptive:add_offset = 1.300000e+06;
       range_adaptive:scale_factor = 1.00e-04;
       range_adaptive:coordinates = "/data_20/longitude /data_20/latitude";
       range_adaptive:comment = "All instrumental corrections included, i.e. distance
antenna-COG (/data_01/range_cor_cog), USO drift correction (/data_01/range_cor_uso),
internal path correction (/data_01/ku/range_cor_internal_path), Doppler correction
(/data_01/ku/range_cor_doppler) and system bias";

byte range_adaptive_compression_qual(time);
       range_adaptive_compression_qual:_FillValue = 127b;
       range_adaptive_compression_qual:long_name = "20 Hz flag for utilization in the
computation of 1 Hz Ku band range (adaptive retracking)";
       range_adaptive_compression_qual:flag_meanings = "yes no";
       range_adaptive_compression_qual:flag_values = 0b, 1b;
       range_adaptive_compression_qual:coordinates = "/data_20/longitude
/data_20/latitude";
       range_adaptive_compression_qual:comment = "Map of valid points used to compute the
1 Hz Ku band altimeter range";
```

// Significant waveheight

```
short swh_ocean(time);
       swh_ocean:_FillValue = 32767s;
```

```
        swh_ocean:long_name = "20 Hz Ku band corrected significant waveheight";
        swh_ocean:standard_name = "sea_surface_wave_significant_height";
        swh_ocean:units = "m";
        swh_ocean:scale_factor = 1.00e-03;
        swh_ocean:coordinates = "/data_20/longitude /data_20/latitude";
        swh_ocean:comment = "Named swh_20hz_ku in GDR-D standard. All instrumental
corrections included, i.e. modeled instrumental errors correction
(/data_01/ku/swh_cor_ocean_model_instr) and system bias";

byte swh_ocean_compression_qual(time);
        swh_ocean_compression_qual:_FillValue = 127b;
        swh_ocean_compression_qual:long_name = "20 Hz flag for utilization in the
computation of 1 Hz Ku band significant waveheight";
        swh_ocean_compression_qual:flag_meanings = "yes no";
        swh_ocean_compression_qual:flag_values = 0b, 1b;
        swh_ocean_compression_qual:coordinates = "/data_20/longitude /data_20/latitude";
        swh_ocean_compression_qual:comment = "Named swh_used_20hz_ku in GDR-D standard.
Map of valid points used to compute the 1 Hz Ku band significant waveheight";
```

// Significant waveheight – - ocean-2 (MLE3)

```
short swh_ocean_mle3(time);
        swh_ocean_mle3:_FillValue = 32767s;
        swh_ocean_mle3:long_name = "20 Hz Ku band corrected significant waveheight (MLE3
retracking)";
        swh_ocean_mle3:standard_name = "sea_surface_wave_significant_height";
        swh_ocean_mle3:units = "m";
        swh_ocean_mle3:scale_factor = 1.00e-03;
        swh_ocean_mle3:coordinates = "/data_20/longitude /data_20/latitude";
        swh_ocean_mle3:comment = "Named swh_20hz_ku_mle3 in GDR-D standard. All
instrumental corrections included, i.e. modeled instrumental errors correction
(/data_01/ku/swh_cor_ocean_mle3_model_instr) and system bias";

byte swh_ocean_mle3_compression_qual(time);
        swh_ocean_mle3_compression_qual:_FillValue = 127b;
        swh_ocean_mle3_compression_qual:long_name = "20 Hz flag for utilization in the
computation of 1 Hz Ku band significant waveheight (MLE3 retracking)";
        swh_ocean_mle3_compression_qual:flag_meanings = "yes no";
        swh_ocean_mle3_compression_qual:flag_values = 0b, 1b;
        swh_ocean_mle3_compression_qual:coordinates = "/data_20/longitude
/data_20/latitude";
        swh_ocean_mle3_compression_qual:comment = "Named swh_used_20hz_ku_mle3 in GDR-D
standard. Map of valid points used to compute the 1 Hz Ku band significant waveheight";
```

// Significant waveheight – - adaptive

```
short swh_adaptive(time);
        swh_adaptive:_FillValue = 32767s;
        swh_adaptive:long_name = "20 Hz Ku band corrected significant waveheight (adaptive
retracking)";
        swh_adaptive:standard_name = "sea_surface_wave_significant_height";
        swh_adaptive:units = "m";
        swh_adaptive:scale_factor = 1.00e-03;
        swh_adaptive:coordinates = "/data_20/longitude /data_20/latitude";
        swh_adaptive:comment = "No correction applied";

byte swh_adaptive_compression_qual(time);
        swh_adaptive_compression_qual:_FillValue = 127b;
        swh_adaptive_compression_qual:long_name = "20 Hz flag for utilization in the
computation of 1 Hz Ku band significant waveheight (adaptive retracking)";
        swh_adaptive_compression_qual:flag_meanings = "yes no";
```

```
       swh_adaptive_compression_qual:flag_values = 0b, 1b;
       swh_adaptive_compression_qual:coordinates = "/data_20/longitude
/data_20/latitude";
       swh_adaptive_compression_qual:comment = "Map of valid points used to compute the 1
Hz Ku band significant waveheight";
```

// Backscatter coefficient

```
short sig0_ocean(time);
       sig0_ocean:_FillValue = 32767s;
       sig0_ocean:long_name = "20 Hz Ku band corrected backscatter coefficient";
       sig0_ocean:standard_name =
"surface_backwards_scattering_coefficient_of_radar_wave";
       sig0_ocean:units = "dB";
       sig0_ocean:scale_factor = 1.00e-02;
       sig0_ocean:coordinates = "/data_20/longitude /data_20/latitude";
       sig0_ocean:comment = "Named sig0_20hz_ku in GDR-D standard. All instrumental
corrections included, excepted the system bias, i.e. AGC instrumental errors correction,
internal calibration correction (/data_01/ku/sig0_cor_calibration), modeled instrumental
errors correction (/data_01/ku/sig0_cor_ocean_model_instr) and atmospheric attenuation
(sig0_cor_atm)";

byte sig0_ocean_compression_qual(time);
       sig0_ocean_compression_qual:_FillValue = 127b;
       sig0_ocean_compression_qual:long_name = "20 Hz flag for utilization in the
computation of 1 Hz Ku band backscatter coefficient";
       sig0_ocean_compression_qual:flag_meanings = "yes no";
       sig0_ocean_compression_qual:flag_values = 0b, 1b;
       sig0_ocean_compression_qual:coordinates = "/data_20/longitude /data_20/latitude";
       sig0_ocean_compression_qual:comment = "Named sig0_used_20hz_ku in GDR-D standard.
Map of valid points used to compute the 1 Hz Ku band backscatter coefficient";
```

// Backscatter coefficient – - ocean-2 (MLE3)

```
short sig0_ocean_mle3(time);
       sig0_ocean_mle3:_FillValue = 32767s;
       sig0_ocean_mle3:long_name = "20 Hz Ku band corrected backscatter coefficient (MLE3
retracking)";
       sig0_ocean_mle3:standard_name =
"surface_backwards_scattering_coefficient_of_radar_wave";
       sig0_ocean_mle3:units = "dB";
       sig0_ocean_mle3:scale_factor = 1.00e-02;
       sig0_ocean_mle3:coordinates = "/data_20/longitude /data_20/latitude";
       sig0_ocean_mle3:comment = "Named sig0_20hz_ku_mle3 in GDR-D standard. All
instrumental corrections included, excepted the system bias, i.e. AGC instrumental errors
correction, internal calibration correction (/data_01/ku/sig0_cor_calibration), modeled
instrumental errors correction (/data_01/ku/sig0_cor_ocean_mle3_model_instr) and
atmospheric attenuation (sig0_cor_atm)";

byte sig0_ocean_mle3_compression_qual(time);
       sig0_ocean_mle3_compression_qual:_FillValue = 127b;
       sig0_ocean_mle3_compression_qual:long_name = "20 Hz flag for utilization in the
computation of 1 Hz Ku band backscatter coefficient (MLE3 retracking)";
       sig0_ocean_mle3_compression_qual:flag_meanings = "yes no";
       sig0_ocean_mle3_compression_qual:flag_values = 0b, 1b;
       sig0_ocean_mle3_compression_qual:coordinates = "/data_20/longitude
/data_20/latitude";
       sig0_ocean_mle3_compression_qual:comment = "Named sig0_used_20hz_ku_mle3 in GDR-D
standard. Map of valid points used to compute the 1 Hz Ku band backscatter coefficient";
```

// Backscatter coefficient – - adaptive

```
short sig0_adaptive(time);
       sig0_adaptive:_FillValue = 32767s;
       sig0_adaptive:long_name = "20 Hz Ku band corrected backscatter coefficient
(adaptive retracking)";
       sig0_adaptive:standard_name =
"surface_backwards_scattering_coefficient_of_radar_wave";
       sig0_adaptive:units = "dB";
       sig0_adaptive:scale_factor = 1.00e-02;
       sig0_adaptive:coordinates = "/data_20/longitude /data_20/latitude";
       sig0_adaptive:comment = "All instrumental corrections included, excepted the
system bias, i.e. AGC instrumental errors correction, internal calibration correction
(/data_01/ku/sig0_cor_calibration) and atmospheric attenuation (sig0_cor_atm)";

byte sig0_adaptive_compression_qual(time);
       sig0_adaptive_compression_qual:_FillValue = 127b;
       sig0_adaptive_compression_qual:long_name = "20 Hz flag for utilization in the
computation of 1 Hz Ku band backscatter coefficient (adaptive retracking)";
       sig0_adaptive_compression_qual:flag_meanings = "yes no";
       sig0_adaptive_compression_qual:flag_values = 0b, 1b;
       sig0_adaptive_compression_qual:coordinates = "/data_20/longitude
/data_20/latitude";
       sig0_adaptive_compression_qual:comment = "Map of valid points used to compute the
1 Hz Ku band backscatter coefficient";
```

// Off nadir angle

```
short off_nadir_angle_wf_ocean(time);
       off_nadir_angle_wf_ocean:_FillValue = 32767s;
       off_nadir_angle_wf_ocean:long_name = "20 Hz square of the off nadir angle computed
from Ku band waveforms";
       off_nadir_angle_wf_ocean:units = "degrees^2";
       off_nadir_angle_wf_ocean:scale_factor = 1.00e-04;
       off_nadir_angle_wf_ocean:coordinates = "/data_20/longitude /data_20/latitude";
       off_nadir_angle_wf_ocean:comment = "Named off_nadir_angle_wf_20hz_ku in GDR-D
standard";

byte off_nadir_angle_wf_ocean_compression_qual(time);
       off_nadir_angle_wf_ocean_compression_qual:_FillValue = 127b;
       off_nadir_angle_wf_ocean_compression_qual:long_name = "20 Hz flag for utilization
in the computation of 1 Hz square of the off nadir angle computed from Ku band
waveforms";
       off_nadir_angle_wf_ocean_compression_qual:flag_meanings = "yes no";
       off_nadir_angle_wf_ocean_compression_qual:flag_values = 0b, 1b;
       off_nadir_angle_wf_ocean_compression_qual:coordinates = "/data_20/longitude
/data_20/latitude";
       off_nadir_angle_wf_ocean_compression_qual:comment = "Named
off_nadir_angle_wf_used_20hz_ku in GDR-D standard. Map of valid points used to compute
the 1 Hz square of the off nadir angle computed from Ku band waveforms";
```

// Ocean retracking outputs

```
byte num_iterations_ocean(time);
       num_iterations_ocean:_FillValue = 127b;
       num_iterations_ocean:long_name = "20O Hz number of iterations of the ocean
retracking in Ku band";
       num_iterations_ocean:units = "count";
       num_iterations_ocean:coordinates = "/data_20/longitude /data_20/latitude";
       num_iterations_ocean:comment = "Named number_of_iterations_ku in GDR-D standard";
```

```
byte num_iterations_ocean_mle3(time);
       num_iterations_ocean_mle3:_FillValue = 127b;
       num_iterations_ocean_mle3:long_name = "20O Hz number of iterations of the ocean
retracking in Ku band (MLE3 retracking)";
       num_iterations_ocean_mle3:units = "count";
       num_iterations_ocean_mle3:coordinates = "/data_20/longitude /data_20/latitude";
       num_iterations_ocean_mle3:comment = "Named number_of_iterations_ku_mle3 in GDR-D
standard";

short num_iterations_adaptive(time);
       num_iterations_adaptive:_FillValue = 32767s;
       num_iterations_adaptive:long_name = "20 Hz number of iterations of the adaptive
retracking in Ku band";
       num_iterations_adaptive:units = "count";
       num_iterations_adaptive:coordinates = "/data_20/longitude /data_20/latitude";
```

// Ice retracking

```
int range_ocog(time);
       range_ocog:_FillValue = 2147483647;
       range_ocog:long_name = "20 Hz Ku band altimeter range (ice retracking)";
       range_ocog:standard_name = "altimeter_range";
       range_ocog:units = "m";
       range_ocog:add_offset = 1.300000e+06;
       range_ocog:scale_factor = 1.00e-04;
       range_ocog:coordinates = "/data_20/longitude /data_20/latitude";
       range_ocog:comment = "Named ice_range_20hz_ku in GDR-D standard. Distance antenna-
COG (/data_01/range_cor_cog), USO drift correction (/data_01/range_cor_uso), internal
path correction (/data_01/ku/range_cor_internal_path), Doppler correction
(/data_01/ku/range_cor_doppler) and system bias included";

short sig0_ocog(time);
       sig0_ocog:_FillValue = 32767s;
       sig0_ocog:long_name = "20 Hz Ku band backscatter coefficient (ice retracking)";
       sig0_ocog:standard_name =
"surface_backwards_scattering_coefficient_of_radar_wave";
       sig0_ocog:units = "dB";
       sig0_ocog:scale_factor = 1.00e-02;
       sig0_ocog:coordinates = "/data_20/longitude /data_20/latitude";
       sig0_ocog:comment = "Named ice_sig0_20hz_ku in GDR-D standard. AGC instrumental
errors correction and internal calibration correction (/data_01/ku/sig0_cor_calibration)
included";
```

// Ice retracking outputs

```
byte ocog_qual(time);
       ocog_qual:_FillValue = 127b;
       ocog_qual:long_name = "20 Hz Ku band ice retracking quality flag";
       ocog_qual:flag_meanings = "good bad";
       ocog_qual:flag_values = 0b, 1b;
       ocog_qual:coordinates = "/data_20/longitude /data_20/latitude";
       ocog_qual:comment = "Named ice_qual_flag_20hz_ku in GDR-D standard. ice retracking
quality flag";
```

// Waveforms characteristics

```
short mqe_ocean(time);
       mqe_ocean:_FillValue = 32767s;
```

```
      mqe_ocean:long_name = "20 Hz Ku band MQE (ocean retracking)";
      mqe_ocean:units = "1";
      mqe_ocean:scale_factor = 1.00e-04;
      mqe_ocean:coordinates = "/data_20/longitude /data_20/latitude";
      mqe_ocean:comment = "Named mqe_20hz_ku in GDR-D standard. Mean Quadratic Error
between the waveforms samples and the corresponding model samples built from the ocean
retracking outputs";

short mqe_ocean_mle3(time);
      mqe_ocean_mle3:_FillValue = 32767s;
      mqe_ocean_mle3:long_name = "20 Hz Ku band MQE (MLE3 retracking)";
      mqe_ocean_mle3:units = "1";
      mqe_ocean_mle3:scale_factor = 1.00e-04;
      mqe_ocean_mle3:coordinates = "/data_20/longitude /data_20/latitude";
      mqe_ocean_mle3:comment = "Named mqe_20hz_ku_mle3 in GDR-D standard. Mean Quadratic
Error between the waveforms samples and the corresponding model samples built from the
MLE3 retracking outputs";

short mqe_adaptive(time);
      mqe_adaptive:_FillValue = 32767s;
      mqe_adaptive:long_name = "20 Hz Ku band MQE (adaptive retracking)";
      mqe_adaptive:units = "1";
      mqe_adaptive:scale_factor = 1.00e-04;
      mqe_adaptive:coordinates = "/data_20/longitude /data_20/latitude";
      mqe_adaptive:comment = "Mean Quadratic Error between the waveforms samples and the
corresponding model samples built from the adaptive retracking outputs";

short peakiness(time);
      peakiness:_FillValue = 32767s;
      peakiness:long_name = "20 Hz peakiness on Ku band waveforms";
      peakiness:units = "1";
      peakiness:scale_factor = 1.00e-03;
      peakiness:coordinates = "/data_20/longitude /data_20/latitude";
      peakiness:comment = "Named peakiness_20hz_ku in GDR-D standard. Mean Quadratic
Error between the waveforms samples and the corresponding model samples built from the
ocean retracking outputs";

byte wvf_main_class(time);
      wvf_main_class:_FillValue = 127b;
      wvf_main_class:long_name = "20 Hz Ku band waveform main class";
      wvf_main_class:flag_meanings = "brown_ocean peaky noise strong_peak
brown_peak_trailing_edge brown_peak_leading_edge brown_flat_trailing_eadge peak_end trash
brown_noise two_leading_edges shifted_brown brown_noise_leading_edge
linear_positive_slope linear_negative_slope";
      wvf_main_class:flag_values = 1b, 2b, 3b, 4b, 5b, 6b, 7b, 8b, 9b, 10b, 11b, 12b,
13b, 15b, 18b;
      wvf_main_class:coordinates = "/data_20/longitude /data_20/latitude";
      wvf_main_class:comment = "Waveform classification : main class selected by
classification neural network trained on shape features of the waveforms";

} // group: ku
```

// 20-Hz C band data

```
group: c {

  variables:
```

// Altimeter range

```
int range_ocean(time);
```

```
      range_ocean:_FillValue = 2147483647;
      range_ocean:long_name = "20 Hz C band corrected altimeter range";
      range_ocean:standard_name = "altimeter_range";
      range_ocean:units = "m";
      range_ocean:add_offset = 1.300000e+06;
      range_ocean:scale_factor = 1.00e-04;
      range_ocean:coordinates = "/data_20/longitude /data_20/latitude";
      range_ocean:comment = "Named range_20hz_c in GDR-D standard. All instrumental
corrections included, i.e. distance antenna-COG (/data_01/range_cor_cog), USO drift
correction (/data_01/range_cor_uso), internal path correction
(/data_01/c/range_cor_internal_path), Doppler correction (/data_01/c/range_cor_doppler),
modeled instrumental errors correction (/data_01/c/range_cor_ocean_model_instr) and
system bias";

byte range_ocean_compression_qual(time);
      range_ocean_compression_qual:_FillValue = 127b;
      range_ocean_compression_qual:long_name = "20 Hz flag for utilization in the
computation of 1 Hz C band range";
      range_ocean_compression_qual:flag_meanings = "yes no";
      range_ocean_compression_qual:flag_values = 0b, 1b;
      range_ocean_compression_qual:coordinates = "/data_20/longitude /data_20/latitude";
      range_ocean_compression_qual:comment = "Named range_used_20hz_c in GDR-D standard.
Map of valid points used to compute the 1 Hz C band altimeter range";
```

// Significant waveheight

```
short swh_ocean(time);
      swh_ocean:_FillValue = 32767s;
      swh_ocean:long_name = "20 Hz C band corrected significant waveheight";
      swh_ocean:standard_name = "sea_surface_wave_significant_height";
      swh_ocean:units = "m";
      swh_ocean:scale_factor = 1.00e-03;
      swh_ocean:coordinates = "/data_20/longitude /data_20/latitude";
      swh_ocean:comment = "Named swh_20hz_c in GDR-D standard. All instrumental
corrections included, i.e. modeled instrumental errors correction
(/data_01/c/swh_cor_ocean_model_instr) and system bias";

byte swh_ocean_compression_qual(time);
      swh_ocean_compression_qual:_FillValue = 127b;
      swh_ocean_compression_qual:long_name = "20 Hz flag for utilization in the
computation of 1 Hz C band significant waveheight";
      swh_ocean_compression_qual:flag_meanings = "yes no";
      swh_ocean_compression_qual:flag_values = 0b, 1b;
      swh_ocean_compression_qual:coordinates = "/data_20/longitude /data_20/latitude";
      swh_ocean_compression_qual:comment = "Named swh_used_20hz_c in GDR-D standard. Map
of valid points used to compute the 1 Hz C band significant waveheight";
```

// Backscatter coefficient

```
short sig0_ocean(time);
      sig0_ocean:_FillValue = 32767s;
      sig0_ocean:long_name = "20 Hz C band corrected backscatter coefficient";
      sig0_ocean:standard_name =
"surface_backwards_scattering_coefficient_of_radar_wave";
      sig0_ocean:units = "dB";
      sig0_ocean:scale_factor = 1.00e-02;
      sig0_ocean:coordinates = "/data_20/longitude /data_20/latitude";
      sig0_ocean:comment = "Named sig0_20hz_c in GDR-D standard. All instrumental
corrections included, excepted the system bias, i.e. AGC instrumental errors correction,
internal calibration correction (/data_01/c/sig0_cor_calibration), modeled instrumental
```

```
errors correction (/data_01/c/sig0_cor_ocean_model_instr) and atmospheric attenuation
(sig0_cor_atm)";

byte sig0_ocean_compression_qual(time);
       sig0_ocean_compression_qual:_FillValue = 127b;
       sig0_ocean_compression_qual:long_name = "20 Hz flag for utilization in the
computation of 1 Hz C band backscatter coefficient";
       sig0_ocean_compression_qual:flag_meanings = "yes no";
       sig0_ocean_compression_qual:flag_values = 0b, 1b;
       sig0_ocean_compression_qual:coordinates = "/data_20/longitude /data_20/latitude";
       sig0_ocean_compression_qual:comment = "Named sig0_used_20hz_c in GDR-D standard.
Map of valid points used to compute the 1 Hz C band backscatter coefficient";
```

// Ocean retracking outputs

```
byte num_iterations_ocean(time);
       num_iterations_ocean:_FillValue = 127b;
       num_iterations_ocean:long_name = "20O Hz number of iterations of the ocean
retracking in C band";
       num_iterations_ocean:units = "count";
       num_iterations_ocean:coordinates = "/data_20/longitude /data_20/latitude";
       num_iterations_ocean:comment = "Named number_of_iterations_c in GDR-D standard
range";
```

// Ice retracking

```
int range_ocog(time);
       range_ocog:_FillValue = 2147483647;
       range_ocog:long_name = "20 Hz C band altimeter range (ice retracking)";
       range_ocog:standard_name = "altimeter_range";
       range_ocog:units = "m";
       range_ocog:add_offset = 1.300000e+06;
       range_ocog:scale_factor = 1.00e-04;
       range_ocog:coordinates = "/data_20/longitude /data_20/latitude";
       range_ocog:comment = "Named ice_range_20hz_c in GDR-D standard. Distance antenna-
COG (/data_01/range_cor_cog), USO drift correction (/data_01/range_cor_uso), internal
path correction (/data_01/c/range_cor_internal_path), Doppler correction
(/data_01/c/range_cor_doppler) and system bias included";

short sig0_ocog(time);
       sig0_ocog:_FillValue = 32767s;
       sig0_ocog:long_name = "20 Hz C band backscatter coefficient (ice retracking)";
       sig0_ocog:standard_name =
"surface_backwards_scattering_coefficient_of_radar_wave";
       sig0_ocog:units = "dB";
       sig0_ocog:scale_factor = 1.00e-02;
       sig0_ocog:coordinates = "/data_20/longitude /data_20/latitude";
       sig0_ocog:comment = "Named ice_sig0_20hz_c in GDR-D standard. AGC instrumental
errors correction and internal calibration correction (/data_01/c/sig0_cor_calibration)
included";
```

// Waveforms characteristics

```
short mqe_ocean(time);
       mqe_ocean:_FillValue = 32767s;
       mqe_ocean:long_name = "20 Hz C band MQE (ocean retracking)";
       mqe_ocean:units = "1";
       mqe_ocean:scale_factor = 1.00e-04;
       mqe_ocean:coordinates = "/data_20/longitude /data_20/latitude";
```

```
      mqe_ocean:comment = "Named mqe_20hz_c in GDR-D standard. Mean Quadratic Error
between the waveforms samples and the corresponding model samples built from the ocean
retracking outputs";

short peakiness(time);
      peakiness:_FillValue = 32767s;
      peakiness:long_name = "20 Hz peakiness on C band waveforms";
      peakiness:units = "1";
      peakiness:scale_factor = 1.00e-03;
      peakiness:coordinates = "/data_20/longitude /data_20/latitude";
      peakiness:comment = "Named peakiness_20hz_c in GDR-D standard.";

} // group: c

} // group: data_20

}
```

8. SGDR DATA SET

All the variables described for the GDR data set are available in SGDR. Below are given the data available only in the SGDR data set.

```
netcdf sgdr {
  dimensions:
    samples = 104;
  variables:
byte samples(samples);
       samples:long_name = "waveform index";
       samples:units = "count";
       samples:comment = "Named wvf_ind in GDR-D standard. Set to be compliant with the
CF-1.7 convention";
```

// 1-Hz data

```
group: data_01 {
  dimensions:
    time = < number of measurements >;
  variables:
```

// Cf. GDR product 1-Hz data

…/… [cf. section 7]

// Altimeter range corrections

```
int range_cor_uso(time);
       range_cor_uso:_FillValue = 2147483647;
       range_cor_uso:long_name = "USO frequency correction on altimeter range";
       range_cor_uso:units = "m";
       range_cor_uso:scale_factor = 1.00e-04;
       range_cor_uso:comment = "Named uso_corr in GDR-D standard. Correction of the USO
frequency drift on the altimeter range";

short range_cor_cog(time);
       range_cor_cog:_FillValue = 32767s;
       range_cor_cog:long_name = "Distance antenna-COG correction on altimeter range";
       range_cor_cog:units = "m";
       range_cor_cog:scale_factor = 1.00e-04;
       range_cor_cog:comment = "Named cog_corr in GDR-D standard";
```

// Radiometer parameters

```
short rad_ta_187(time);
       rad_ta_187:_FillValue = 32767s;
       rad_ta_187:long_name = "18.7 GHz antenna temperature";
       rad_ta_187:units = "K";
       rad_ta_187:scale_factor = 1.00e-02;
       rad_ta_187:coordinates = "longitude latitude";
       rad_ta_187:comment = "Named ta_187 in GDR-D standard";

short rad_ta_238(time);
       rad_ta_238:_FillValue = 32767s;
       rad_ta_238:long_name = "23.8 GHz antenna temperature";
       rad_ta_238:units = "K";
       rad_ta_238:scale_factor = 1.00e-02;
       rad_ta_238:coordinates = "longitude latitude";
       rad_ta_238:comment = "Named ta_238 in GDR-D standard";

short rad_ta_340(time);
       rad_ta_340:_FillValue = 32767s;
       rad_ta_340:long_name = "34 GHz antenna temperature";
       rad_ta_340:units = "K";
       rad_ta_340:scale_factor = 1.00e-02;
       rad_ta_340:coordinates = "longitude latitude";
       rad_ta_340:comment = "Named ta_340 in GDR-D standard";
```

// 1-Hz Ku band data

```
group: ku {

  variables:
```

// Cf. GDR product 1-Hz Ku band data

…/… [cf. section 7]

// Altimeter range corrections

```
int range_cor_internal_path(time);
       range_cor_internal_path:_FillValue = 2147483647;
       range_cor_internal_path:long_name = "Ku band internal path delay correction on
altimeter range";
       range_cor_internal_path:units = "m";
       range_cor_internal_path:scale_factor = 1.00e-04;
       range_cor_internal_path:comment = "Named internal_path_delay_corr_ku in GDR-D
standard. Internal calibration correction on the Ku band altimeter range";

short range_cor_ocean_model_instr(time);
       range_cor_ocean_model_instr:_FillValue = 32767s;
       range_cor_ocean_model_instr:long_name = "Ku band modeled instrumental correction
on altimeter range";
       range_cor_ocean_model_instr:units = "m";
       range_cor_ocean_model_instr:scale_factor = 1.00e-04;
       range_cor_ocean_model_instr:comment = "Named modeled_instr_corr_range_ku in GDR-D
standard";

short range_cor_ocean_mle3_model_instr(time);
       range_cor_ocean_mle3_model_instr:_FillValue = 32767s;
       range_cor_ocean_mle3_model_instr:long_name = "Ku band modeled instrumental
correction on altimeter range (MLE3 retracking)";
       range_cor_ocean_mle3_model_instr:units = "m";
       range_cor_ocean_mle3_model_instr:scale_factor = 1.00e-04;
```

```
      range_cor_ocean_mle3_model_instr:comment = "Named modeled_instr_corr_range_ku_mle3
in GDR-D standard";

short range_cor_doppler(time);
      range_cor_doppler:_FillValue = 32767s;
      range_cor_doppler:long_name = "Ku band Doppler correction on altimeter range";
      range_cor_doppler:units = "m";
      range_cor_doppler:scale_factor = 1.00e-04;
      range_cor_doppler:comment = "Named doppler_corr_ku in GDR-D standard";
```

// Significant waveheight corrections

```
short swh_cor_ocean_model_instr(time);
      swh_cor_ocean_model_instr:_FillValue = 32767s;
      swh_cor_ocean_model_instr:long_name = "Ku band modeled instrumental correction on
significant waveheight";
      swh_cor_ocean_model_instr:units = "m";
      swh_cor_ocean_model_instr:scale_factor = 1.00e-03;
      swh_cor_ocean_model_instr:comment = "Named modeled_instr_corr_swh_ku in GDR-D
standard";

short swh_cor_ocean_mle3_model_instr(time);
      swh_cor_ocean_mle3_model_instr:_FillValue = 32767s;
      swh_cor_ocean_mle3_model_instr:long_name = "Ku band modeled instrumental
correction on significant waveheight (MLE3 retracking)";
      swh_cor_ocean_mle3_model_instr:units = "m";
      swh_cor_ocean_mle3_model_instr:scale_factor = 1.00e-03;
      swh_cor_ocean_mle3_model_instr:comment = "Named modeled_instr_corr_swh_ku_mle3 in
GDR-D standard";
```

// Backscatter coefficient corrections

```
short sig0_cor_calibration(time);
      sig0_cor_calibration:_FillValue = 32767s;
      sig0_cor_calibration:long_name = "Ku band internal calibration correction on
backscatter coefficient";
      sig0_cor_calibration:units = "dB";
      sig0_cor_calibration:scale_factor = 1.00e-02;
      sig0_cor_calibration:comment = "Named internal_corr_sig0_ku in GDR-D standard";

short sig0_cor_ocean_model_instr (time);
      sig0_cor_ocean_model_instr:_FillValue = 32767s;
      sig0_cor_ocean_model_instr:long_name = "Ku band modeled instrumental correction on
backscatter coefficient";
      sig0_cor_ocean_model_instr:units = "dB";
      sig0_cor_ocean_model_instr:scale_factor = 1.00e-02;
      sig0_cor_ocean_model_instr:comment = "Named modeled_instr_corr_sig0_ku in GDR-D
standard";

short sig0_cor_ocean_mle3_model_instr(time);
      sig0_cor_ocean_mle3_model_instr:_FillValue = 32767s;
      sig0_cor_ocean_mle3_model_instr:long_name = "Ku band modeled instrumental
correction on backscatter coefficient (MLE3 retracking)";
      sig0_cor_ocean_mle3_model_instr:units = "dB";
      sig0_cor_ocean_mle3_model_instr:scale_factor = 1.00e-02;
      sig0_cor_ocean_mle3_model_instr:comment = "Named modeled_instr_corr_sig0_ku_mle3
in GDR-D standard";

} // group: ku
```

// 1-Hz C band data

```
group: c {

  variables:
```

// Cf. GDR product 1-Hz C band data

…/… [cf. section 7]

// Altimeter range corrections

```
int range_cor_internal_path(time);
       range_cor_internal_path:_FillValue = 2147483647;
       range_cor_internal_path:long_name = "C band internal path delay correction on
altimeter range";
       range_cor_internal_path:units = "m";
       range_cor_internal_path:scale_factor = 1.00e-04;
       range_cor_internal_path:comment = "Named internal_path_delay_corr_c in GDR-D
standard. Internal calibration correction on the C band altimeter range";

short range_cor_ocean_model_instr(time);
       range_cor_ocean_model_instr:_FillValue = 32767s;
       range_cor_ocean_model_instr:long_name = "C band modeled instrumental correction on
altimeter range";
       range_cor_ocean_model_instr:units = "m";
       range_cor_ocean_model_instr:scale_factor = 1.00e-04;
       range_cor_ocean_model_instr:comment = "Named modeled_instr_corr_range_c in GDR-D
standard";

short range_cor_doppler(time);
       range_cor_doppler:_FillValue = 32767s;
       range_cor_doppler:long_name = "C band Doppler correction on altimeter range";
       range_cor_doppler:units = "m";
       range_cor_doppler:scale_factor = 1.00e-04;
       range_cor_doppler:comment = "Named doppler_corr_c in GDR-D standard";
```

// Significant waveheight corrections

```
short swh_cor_ocean_model_instr(time);
       swh_cor_ocean_model_instr:_FillValue = 32767s;
       swh_cor_ocean_model_instr:long_name = "C band modeled instrumental correction on
significant waveheight";
       swh_cor_ocean_model_instr:units = "m";
       swh_cor_ocean_model_instr:scale_factor = 1.00e-03;
       swh_cor_ocean_model_instr:comment = "Named modeled_instr_corr_swh_c in GDR-D
standard";
```

// Backscatter coefficient corrections

```
short sig0_cor_calibration(time);
       sig0_cor_calibration:_FillValue = 32767s;
       sig0_cor_calibration:long_name = "C band internal calibration correction on
backscatter coefficient";
       sig0_cor_calibration:units = "dB";
       sig0_cor_calibration:scale_factor = 1.00e-02;
       sig0_cor_calibration:comment = "Named internal_corr_sig0_c in GDR-D standard";
```

```
short sig0_cor_ocean_model_instr(time);
       sig0_cor_ocean_model_instr:_FillValue = 32767s;
       sig0_cor_ocean_model_instr:long_name = "C band modeled instrumental on backscatter
coefficient";
       sig0_cor_ocean_model_instr:units = "dB";
       sig0_cor_ocean_model_instr:scale_factor = 1.00e-02;
       sig0_cor_ocean_model_instr:comment = "Named modeled_instr_corr_sig0_c in GDR-D
standard";

} // group: c

} // group: data_01
```

// 20-Hz data

```
group: data_20 {

  dimensions:

    time = < number of measurements >;

  variables:
```

// Cf. GDR product 20-Hz data

…/… [cf. section 7]

// Tracker range

```
int tracker_range_counter(time);
       tracker_range_counter:_FillValue = 2147483647;
       tracker_range_counter:long_name = "20 Hz tracker range counter [3.125/64 ns]";
       tracker_range_counter:units = "count";
       tracker_range_counter:add_offset = 2147483648.;
       tracker_range_counter:coordinates = "longitude latitude";
       tracker_range_counter:comment = "Named tracker_counter_20hz in GDR-D standard.
Tracker range counter with a resolution of 3.125/64 ns";

short tracker_range_rate_counter(time);
       tracker_range_rate_counter:_FillValue = 32767s;
       tracker_range_rate_counter:long_name = "20 Hz tracker range rate counter
[3.125/1024 ns]";
       tracker_range_rate_counter:units = "count";
       tracker_range_rate_counter:coordinates = "longitude latitude";
       tracker_range_rate_counter:comment = "Named tracker_rate_counter_20hz in GDR-D
standard. Tracker range rate counter with a resolution of 3.125/1024 ns";
```

// 20-Hz Ku band data

```
group: ku {

  variables:
```

// Cf. GDR product 20-Hz Ku band data

…/… [cf. section 7]

// Tracker range

```
int tracker_range_calibrated(time);
       tracker_range_calibrated:_FillValue = 2147483647;
       tracker_range_calibrated:long_name = "20 Hz Ku band corrected tracker range";
       tracker_range_calibrated:standard_name = "altimeter_range";
       tracker_range_calibrated:units = "m";
       tracker_range_calibrated:add_offset = 1.300000e+06;
       tracker_range_calibrated:scale_factor = 1.00e-04;
       tracker_range_calibrated:coordinates = "/data_20/longitude /data_20/latitude";
       tracker_range_calibrated:comment = "Named tracker_20hz_ku in GDR-D standard. Ku
band operating tracker (’Diode+DEM’ or ’Median’ or ’Split-Gate’ tracker). This includes
the Distance antenna-COG (/data_01/range_cor_cog), USO drift correction
(/data_01/range_cor_uso) and internal path correction
(/data_01/ku/range_cor_internal_path). But not the Doppler correction
(/data_01/ku/range_cor_doppler), modeled instrumental errors correction
(/data_01/ku/range_cor_ocean_model_instr) and system bias";

int tracker_range_diode(time);
       tracker_range_diode:_FillValue = 2147483647;
       tracker_range_diode:long_name = "20 Hz Ku band tracker range from Diode+DEM";
       tracker_range_diode:standard_name = "altimeter_range";
       tracker_range_diode:units = "m";
       tracker_range_diode:add_offset = 1.300000e+06;
       tracker_range_diode:scale_factor = 1.00e-04;
       tracker_range_diode:coordinates = "/data_20/longitude /data_20/latitude";
       tracker_range_diode:comment = "Named tracker_diode_20hz_ku in GDR-D standard";
```

// Tracker AGC

```
short agc(time);
       agc:_FillValue = 32767s;
       agc:long_name = "20 Hz Ku band corrected AGC";
       agc:units = "dB";
       agc:scale_factor = 1.00e-02;
       agc:coordinates = "/data_20/longitude /data_20/latitude";
       agc:comment = "Named agc_20hz_ku in GDR-D standard. AGC is corrected for
instrumental errors due to the imperfections of the on-board attenuators";

short agc_cor(time);
       agc_cor:_FillValue = 32767s;
       agc_cor:long_name = "20 Hz Ku band AGC correction";
       agc_cor:units = "dB";
       agc_cor:scale_factor = 1.00e-02;
       agc_cor:coordinates = "/data_20/longitude /data_20/latitude";
       agc_cor:comment = "Named agc_corr_20hz_ku in GDR-D standard. Comes from AGC static
characterization, and added to on-board AGC to obtain applied AGC";
```

// Scaling factors for Sigma0 evaluation

```
int sig0_scaling_factor(time);
       sig0_scaling_factor:_FillValue = 2147483647;
       sig0_scaling_factor:long_name = "Scaling factor for Ku band backscatter
coefficient";
       sig0_scaling_factor:units = "dB";
       sig0_scaling_factor:scale_factor = 1.00e-02;
       sig0_scaling_factor:coordinates = "/data_20/longitude /data_20/latitude";
```

```
      sig0_scaling_factor:comment = "Named scaling_factor_20hz_ku in GDR-D standard.
This scaling factor represents the backscatter coefficient for a Ku band waveform
amplitude equal to 1. It is a raw value accounting for AGC 20 Hz correction and internal
calibration correction. All other correction are not applied (ie atmospheric attenuation,
modeled instrumental errors correction and system bias)";
```

// Ocean retracking outputs

// Ocean-3 (MLE4) outputs

```
int epoch_ocean(time);
       epoch_ocean:_FillValue = 2147483647;
       epoch_ocean:long_name = "Ku band epoch (ocean retracking)";
       epoch_ocean:units = "s";
       epoch_ocean:scale_factor = 1.00e-15;
       epoch_ocean:coordinates = "/data_20/longitude /data_20/latitude";
       epoch_ocean:comment = "Named epoch_20hz_ku in GDR-D standard";

int sigmac_ocean(time);
       sigmac_ocean:_FillValue = 2147483647;
       sigmac_ocean:long_name = "Ku band width of the leading edge (ocean retracking)";
       sigmac_ocean:units = "s";
       sigmac_ocean:scale_factor = 1.00e-15;
       sigmac_ocean:coordinates = "/data_20/longitude /data_20/latitude";
       sigmac_ocean:comment = "Named width_leading_edge_20hz_ku in GDR-D standard. The
width of the leading edge corresponds to the so-called composite sigma (SigmaC)";

int amplitude_ocean(time);
       amplitude_ocean:_FillValue = 2147483647;
       amplitude_ocean:long_name = "Ku band amplitude (ocean retracking) [FFT power
unit]";
       amplitude_ocean:units = "count";
       amplitude_ocean:scale_factor = 1.00e-06;
       amplitude_ocean:coordinates = "/data_20/longitude /data_20/latitude";
       amplitude_ocean:comment = "Named amplitude_20hz_ku in GDR-D standard";

int noise_floor_ocean(time);
       noise_floor_ocean:_FillValue = 2147483647;
       noise_floor_ocean:long_name = "Ku band thermal noise (ocean retracking) [FFT power
unit]";
       noise_floor_ocean:units = "count";
       noise_floor_ocean:scale_factor = 1.00e-06;
       noise_floor_ocean:coordinates = "/data_20/longitude /data_20/latitude";
       noise_floor_ocean:comment = "Named thermal_noise_20hz_ku in GDR-D standard";
```

// Ocean-2 (MLE3) outputs

```
int epoch_ocean_mle3(time);
       epoch_ocean_mle3:_FillValue = 2147483647;
       epoch_ocean_mle3:long_name = "Ku band epoch (MLE3 retracking)";
       epoch_ocean_mle3:units = "s";
       epoch_ocean_mle3:scale_factor = 1.00e-15;
       epoch_ocean_mle3:coordinates = "/data_20/longitude /data_20/latitude";
       epoch_ocean_mle3:comment = "Named epoch_20hz_ku_mle3 in GDR-D standard";

int sigmac_ocean_mle3(time);
       sigmac_ocean_mle3:_FillValue = 2147483647;
       sigmac_ocean_mle3:long_name = "Ku band width of the leading edge (MLE3
retracking)";
       sigmac_ocean_mle3:units = "s";
       sigmac_ocean_mle3:scale_factor = 1.00e-15;
       sigmac_ocean_mle3:coordinates = "/data_20/longitude /data_20/latitude";
```

```
      sigmac_ocean_mle3:comment = "Named width_leading_edge_20hz_ku_mle3 in GDR-D
standard. The width of the leading edge corresponds to the so-called composite sigma
(SigmaC)";

int amplitude_ocean_mle3(time);
      amplitude_ocean_mle3:_FillValue = 2147483647;
      amplitude_ocean_mle3:long_name = "Ku band amplitude (MLE3 retracking) [FFT power
unit]";
      amplitude_ocean_mle3:units = "count";
      amplitude_ocean_mle3:scale_factor = 1.00e-06;
      amplitude_ocean_mle3:coordinates = "/data_20/longitude /data_20/latitude";
      amplitude_ocean_mle3:comment = "Named amplitude_20hz_ku_mle3 in GDR-D standard";
```

// Adaptive retracking outputs

```
int epoch_adaptive(time);
      epoch_adaptive:_FillValue = 2147483647;
      epoch_adaptive:long_name = "Ku band epoch (adaptive retracking)";
      epoch_adaptive:units = "s";
      epoch_adaptive:scale_factor = 1.00e-15;
      epoch_adaptive:coordinates = "/data_20/longitude /data_20/latitude";

int amplitude_adaptive(time);
      amplitude_adaptive:_FillValue = 2147483647;
      amplitude_adaptive:long_name = "Ku band amplitude (adaptive retracking) [FFT power
unit]";
      amplitude_adaptive:units = "count";
      amplitude_adaptive:scale_factor = 1.00e-06;
      amplitude_adaptive:coordinates = "/data_20/longitude /data_20/latitude";

int noise_floor_adaptive(time);
      noise_floor_adaptive:_FillValue = 2147483647;
      noise_floor_adaptive:long_name = "Ku band thermal noise (adaptive retracking) [FFT
power unit]";
      noise_floor_adaptive:units = "count";
      noise_floor_adaptive:scale_factor = 1.00e-06;
      noise_floor_adaptive:coordinates = "/data_20/longitude /data_20/latitude";

int gamma_adaptive(time);
      gamma_adaptive:_FillValue = 2147483647;
      gamma_adaptive:long_name = "Ku band gamma (adaptive retracking)";
      gamma_adaptive:units = "count";
      gamma_adaptive:scale_factor = 1.00e-06;
      gamma_adaptive:coordinates = "/data_20/longitude /data_20/latitude";

int convergence_criteria_adaptive(time);
      convergence_criteria_adaptive:_FillValue = 2147483647;
      convergence_criteria_adaptive:long_name = "Ku band convergence criteria (adaptive
retracking)";
      convergence_criteria_adaptive:units = "count";
      convergence_criteria_adaptive:scale_factor = 1.00e-02;
      convergence_criteria_adaptive:coordinates = "/data_20/longitude
/data_20/latitude";
```

// Waveforms characteristics

```
short wvf_main_class_score(time);
      wvf_main_class_score:_FillValue = 32767s;
      wvf_main_class_score:long_name = "20 Hz Ku band waveform main class probability";
      wvf_main_class_score:scale_factor = 1.00e-02;
      wvf_main_class_score:coordinates = "/data_20/longitude /data_20/latitude";
```

```
      wvf_main_class_score:comment = "Waveform classification : probability associated
to the main class (between 0 and 100, 100=strongest probability)";

byte wvf_second_class(time);
      wvf_second_class:_FillValue = 127b;
      wvf_second_class:long_name = "20 Hz Ku band waveform second class";
      wvf_second_class:flag_meanings = "brown_ocean peaky noise strong_peak
brown_peak_trailing_edge brown_peak_leading_edge brown_flat_trailing_eadge peak_end trash
brown_noise two_leading_edges shifted_brown brown_noise_leading_edge
linear_positive_slope linear_negative_slope";
      wvf_second_class:flag_values = 1b, 2b, 3b, 4b, 5b, 6b, 7b, 8b, 9b, 10b, 11b, 12b,
13b, 15b, 18b;
      wvf_second_class:coordinates = "/data_20/longitude /data_20/latitude";
      wvf_second_class:comment = "Waveform classification : second class selected by
classification neural network trained on shape features of the waveforms";

short wvf_second_class_score(time);
      wvf_second_class_score:_FillValue = 32767s;
      wvf_second_class_score:long_name = "20 Hz Ku band waveform second class
probability";
      wvf_second_class_score:scale_factor = 1.00e-02;
      wvf_second_class_score:coordinates = "/data_20/longitude /data_20/latitude";
      wvf_second_class_score:comment = "Waveform classification : probability associated
to the second class (between 0 and 100, 100=strongest probability)";
```

// Waveforms

```
int power_waveform(time, samples);
      power_waveform:_FillValue = 2147483647;
      power_waveform:long_name = "Ku band waveform samples";
      power_waveform:units = "count";
      power_waveform:scale_factor = 1.00e-03;
      power_waveform:comment = "Named waveforms_20hz_ku in GDR-D standard. Waveforms are
corrected for the Low Pass Filter effects";

} // group: ku
```

// 20-Hz C band data

```
group: c {
  variables:
```

// Cf. GDR product 20-Hz C band data

…/… [cf. section 7]

// Tracker range

```
int tracker_range_calibrated(time);
      tracker_range_calibrated:_FillValue = 2147483647;
      tracker_range_calibrated:long_name = "20 Hz C band corrected tracker range";
      tracker_range_calibrated:standard_name = "altimeter_range";
      tracker_range_calibrated:units = "m";
      tracker_range_calibrated:add_offset = 1.300000e+06;
      tracker_range_calibrated:scale_factor = 1.00e-04;
      tracker_range_calibrated:coordinates = "/data_20/longitude /data_20/latitude";
```

```
      tracker_range_calibrated:comment = "Named tracker_20hz_c in GDR-D standard. C band
operating tracker. This includes the Distance antenna-COG (/data_01/range_cor_cog), USO
drift correction (/data_01/range_cor_uso) and internal path correction
(/data_01/c/range_cor_internal_path). But not the Doppler correction
(/data_01/c/range_cor_doppler), modeled instrumental errors correction
(/data_01/c/range_cor_ocean_model_instr) and system bias";
```

// Tracker AGC

```
short agc(time);
      agc:_FillValue = 32767s;
      agc:long_name = "20 Hz C band corrected AGC";
      agc:units = "dB";
      agc:scale_factor = 1.00e-02;
      agc:coordinates = "/data_20/longitude /data_20/latitude";
      agc:comment = "Named agc_20hz_c in GDR-D standard. AGC is corrected for
instrumental errors due to the imperfections of the on-board attenuators";

short agc_cor(time);
      agc_cor:_FillValue = 32767s;
      agc_cor:long_name = "20 Hz C band AGC correction";
      agc_cor:units = "dB";
      agc_cor:scale_factor = 1.00e-02;
      agc_cor:coordinates = "/data_20/longitude /data_20/latitude";
      agc_cor:comment = "Named agc_corr_20hz_c in GDR-D standard. Comes from AGC static
characterization, and added to on-board AGC to obtain applied AGC";
```

// Scaling factors for Sigma0 evaluation

```
int sig0_scaling_factor(time);
      sig0_scaling_factor:_FillValue = 2147483647;
      sig0_scaling_factor:long_name = "Scaling factor for C band backscatter
coefficient";
      sig0_scaling_factor:units = "dB";
      sig0_scaling_factor:scale_factor = 1.00e-02;
      sig0_scaling_factor:coordinates = "/data_20/longitude /data_20/latitude";
      sig0_scaling_factor:comment = "Named scaling_factor_20hz_c in GDR-D standard. This
scaling factor represents the backscatter coefficient for a C band waveform amplitude
equal to 1. It is a raw value accounting for AGC 20 Hz correction and internal
calibration correction. All other correction are not applied (ie atmospheric attenuation,
modeled instrumental errors correction and system bias)";
```

// Ocean retracking outputs

// Ocean-3 (MLE4) outputs

```
int epoch_ocean (time);
      epoch_ocean:_FillValue = 2147483647;
      epoch_ocean:long_name = "C band epoch (ocean retracking)";
      epoch_ocean:units = "s";
      epoch_ocean:scale_factor = 1.00e-15;
      epoch_ocean:coordinates = "/data_20/longitude /data_20/latitude";
      epoch_ocean:comment = "Named epoch_20hz_c in GDR-D standard";

int sigmac_ocean(time);
      sigmac_ocean:_FillValue = 2147483647;
      sigmac_ocean:long_name = "C band width of the leading edge (ocean retracking)";
      sigmac_ocean:units = "s";
      sigmac_ocean:scale_factor = 1.00e-15;
```

```
       sigmac_ocean:coordinates = "/data_20/longitude /data_20/latitude";
       sigmac_ocean:comment = "Named width_leading_edge_20hz_c in GDR-D standard. The
width of the leading edge corresponds to the so-called composite sigma (SigmaC)";

int amplitude_ocean(time);
       amplitude_ocean:_FillValue = 2147483647;
       amplitude_ocean:long_name = "C band amplitude (ocean retracking) [FFT power
unit]";
       amplitude_ocean:units = "count";
       amplitude_ocean:scale_factor = 1.00e-06;
       amplitude_ocean:coordinates = "/data_20/longitude /data_20/latitude";
       amplitude_ocean:comment = "Named amplitude_20hz_c in GDR-D standard";

int noise_floor_ocean (time);
       noise_floor_ocean:_FillValue = 2147483647;
       noise_floor_ocean:long_name = "C band thermal noise (ocean retracking) [FFT power
unit]";
       noise_floor_ocean:units = "count";
       noise_floor_ocean:scale_factor = 1.00e-06;
       noise_floor_ocean:coordinates = "/data_20/longitude /data_20/latitude";
       noise_floor_ocean:comment = "Named thermal_noise_20hz_c in GDR-D standard";
```

// Waveforms

```
int power_waveform(time, samples);
       power_waveform:_FillValue = 2147483647;
       power_waveform:long_name = "C band waveform samples";
       power_waveform:units = "count";
       power_waveform:scale_factor = 1.00e-03;
       power_waveform:comment = "Named waveforms_20hz_c in GDR-D standard. Waveforms are
corrected for the Low Pass Filter effects";


} // group: c

} // group: data_20

}
```

DIFFUSION

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WERY Florian	DNO/OT/AR
DIPPENWEILER Emeric	DNO/OT/AR
BOY François	DSO/SI/TR
MARALDI Claire	DSO/SI/TR
GUINLE Thierry	DNO/OT/OC
JOUAN Christophe	DNO/OT/OC
MARECHAL Christophe	DNO/OT/OC
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