

1. Overview

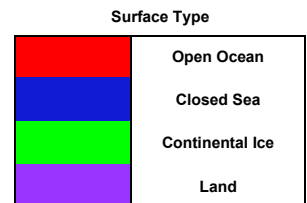
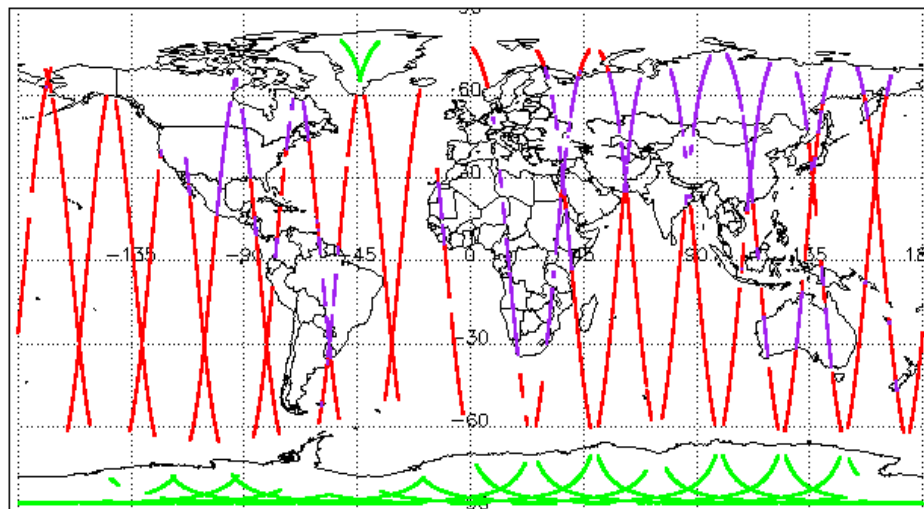
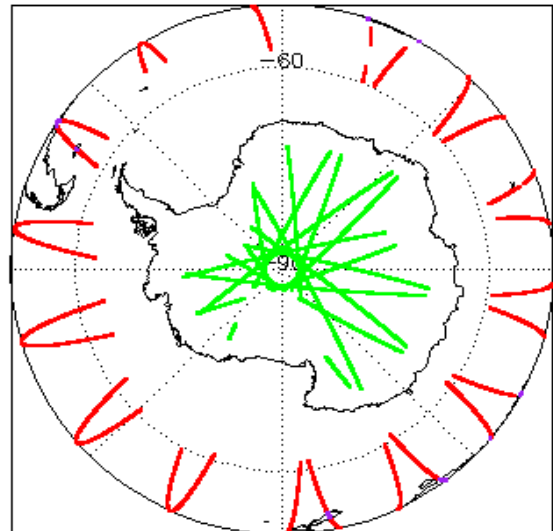
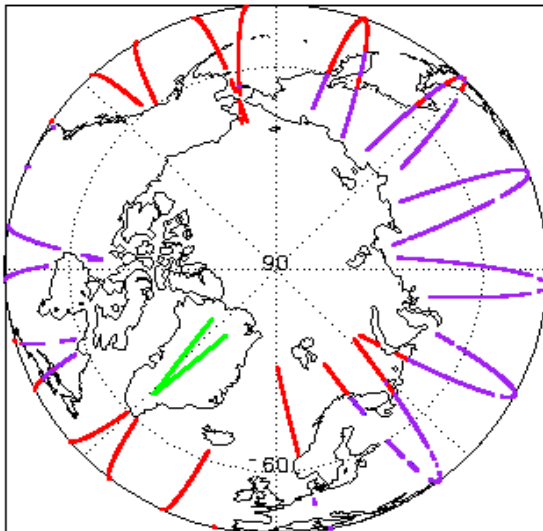
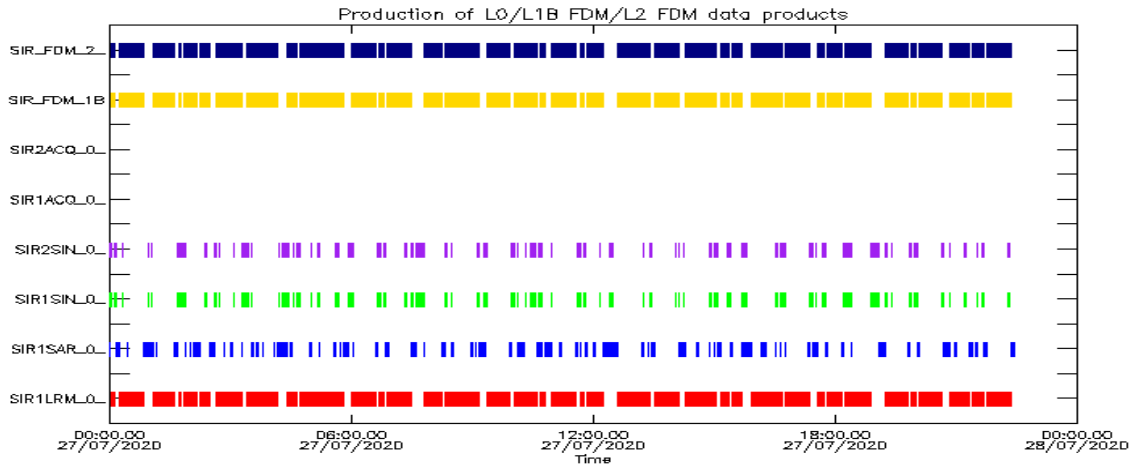
Report Production Date:	28-Jul-2020
Processor Used:	CryoSat Ice Processor
Data Used:	L1 and L2 Fast Delivery Marine (FDM) Mode and L0 Data

Check	Status
Server check: science-pds.cryosat.esa.int	Nominal
Server check: calval-pds.cryosat.esa.int	Nominal
Product Software Check	Nominal
Product Format Check	Nominal
Product Header Analysis	See Section 4.2, 5.2 and 6.2
Star Tracker Usage Check	See Section 5.3
Calibration Usage Check	Nominal
Auxiliary Data File Usage Check	See Section 5.5 and 6.3
Auxiliary Correction Error Check	See Section 5.6 and 6.4
Measurement Confidence Data Check	See Section 5.7, 6.5, 6.6, 6.7 and 6.8
QCC Error/ Warning Check	See Section 7.1 and 7.2

Mission / Instrument News

26-Jul-2020	AUX1 IONGIM files delayed
27-Jul-2020	CRYO2ICE Orbit raising activities. SIRAL unavailability from 27/07/2020 22:26:11 to 28/07/2020 05:09:47. AUX1 IONGIM files continue to be delayed
28-Jul-2020	CRYO2ICE Orbit raising activities.

2. Production Completeness & Global Coverage



3. Instrument Configuration

The SIRAL instrument configuration for the day of acquisition is provided below.

SIRAL instrument(s) in use:	SIRAL - A
Star Tracker(s) in use:	Star Tracker 1

4. Level 0 Data Quality Check

4.1 L0 Product Format Check

Each product, retrieved and unpacked from the science server, is checked to ensure it consists of both an XML header file (.HDR) and a binary product file (.DBL).

Number of products with errors: 0

4.2 L0 Product Header Analysis

For all products, a series of pre-defined checks are carried out on the MPH and SPH in order to identify any inconsistencies and/or errors raised by the processing chain.

Number of products with errors: 1

Product	Test Failed
CS_OPER_SIR1SIN_0__20200727T031717_20200727T032310_0001.HDR	Percentage of processing errors detected greater than minimum acceptable threshold.

5. Level 1B FDM Data Quality Check

5.1 L1B FDM Product Format Check

Each product, retrieved and unpacked from the science server, is checked to ensure it consists of both an XML header file (.HDR) and a binary product file (.DBL).

Number of products with errors: 0

5.2 L1B FDM Product Header Analysis

For all products, a series of pre-defined checks are carried out on the MPH and SPH in order to identify any inconsistencies and/or errors raised by the ground-segment processing chain.

Number of products with errors: 8

Product	Test Failed
CS_OFFL_SIR_FDM_1B_20200727T072117_20200727T072430_C001.DBL	FOS Predicted Orbit (MPL_ORBPRES) used instead of the DORIS Navigator Orbit (DOR_NAV).
CS_OFFL_SIR_FDM_1B_20200727T072430_20200727T072747_C001.DBL	FOS Predicted Orbit (MPL_ORBPRES) used instead of the DORIS Navigator Orbit (DOR_NAV).
CS_OFFL_SIR_FDM_1B_20200727T090048_20200727T090141_C001.DBL	FOS Predicted Orbit (MPL_ORBPRES) used instead of the DORIS Navigator Orbit (DOR_NAV).
CS_OFFL_SIR_FDM_1B_20200727T090141_20200727T090158_C001.DBL	FOS Predicted Orbit (MPL_ORBPRES) used instead of the DORIS Navigator Orbit (DOR_NAV).
CS_OFFL_SIR_FDM_1B_20200727T104036_20200727T104050_C001.DBL	FOS Predicted Orbit (MPL_ORBPRES) used instead of the DORIS Navigator Orbit (DOR_NAV).
CS_OFFL_SIR_FDM_1B_20200727T104050_20200727T104108_C001.DBL	FOS Predicted Orbit (MPL_ORBPRES) used instead of the DORIS Navigator Orbit (DOR_NAV).
CS_OFFL_SIR_FDM_1B_20200727T140329_20200727T140651_C001.DBL	FOS Predicted Orbit (MPL_ORBPRES) used instead of the DORIS Navigator Orbit (DOR_NAV).
CS_OFFL_SIR_FDM_1B_20200727T140651_20200727T140721_C001.DBL	FOS Predicted Orbit (MPL_ORBPRES) used instead of the DORIS Navigator Orbit (DOR_NAV).

5.3 L1B FDM Star Tracker Usage Check

Each product is checked in order to ensure a valid star tracker file has been used in processing.

Number of products with errors: 4

Product	Test Failed
CS_OFFL_SIR_FDM_1B_20200727T072117_20200727T072430_C001	No Star Tracker file used in the processing of this product
CS_OFFL_SIR_FDM_1B_20200727T090048_20200727T090141_C001	No Star Tracker file used in the processing of this product
CS_OFFL_SIR_FDM_1B_20200727T104036_20200727T104050_C001	No Star Tracker file used in the processing of this product
CS_OFFL_SIR_FDM_1B_20200727T140329_20200727T140651_C001	No Star Tracker file used in the processing of this product

5.4 L1B FDM Calibration Usage Check

Each product is checked in order to ensure the necessary calibration files have been used in processing.

Number of products with errors: 0

5.5 L1B FDM Auxiliary Data File Usage Check

Each product is checked for missing Data Set Descriptors with respect to a pre-determined baseline and also to check the validity of Auxiliary Data Files is correct.

Number of products with errors: 147

Product	AUX File	Comment
147 FDM_1B products from 2020/07/27 00:03:24 until 2020/07/27 22:20:38	AUX IONGIM	Due to a missing Forecast Auxiliary File there is an error with the Ionospheric Correction

5.6 L1B FDM Auxiliary Correction Error Check

CryoSat L1B data includes a correction error flag (field 54) for each measurement record. The bit value of this flag indicates any problems when set.

Number of products with errors: 147

Product	Test Failed	Description
147 FDM_1B products from 2020/07/27 00:03:24 until 2020/07/27 22:20:38	Dynamic atmosphere correction, GIM ionospheric correction	Due to a missing Forecast Auxiliary Files there is an error with the Dry Tropospheric, Wet Tropospheric and Inverse Barometric Corrections

5.7 L1B FDM Measurement Confidence Data Check

CryoSat L1B data includes a measurement confidence flag (field 18) for each measurement record. The bit value of this flag indicates any problems when set.

Number of products with errors: 6

Product	Test Failed	Description
CS_OFFL_SIR_FDM_1B_20200727T072117_20200727T072430_C001	Attitude correction missing	The attitude has not been corrected
CS_OFFL_SIR_FDM_1B_20200727T090048_20200727T090141_C001	Attitude correction missing	The attitude has not been corrected
CS_OFFL_SIR_FDM_1B_20200727T104036_20200727T104050_C001	Attitude correction missing	The attitude has not been corrected
CS_OFFL_SIR_FDM_1B_20200727T140329_20200727T140651_C001	Attitude correction missing	The attitude has not been corrected
CS_OFFL_SIR_FDM_1B_20200727T141536_20200727T142114_C001	Echo error, TRK echo error	The tracking echo has returned an error and the Rx1 Echo Error flag is set, indicating a degraded echo
CS_OFFL_SIR_FDM_1B_20200727T211432_20200727T212005_C001	Echo error, TRK echo error	The tracking echo has returned an error and the Rx1 Echo Error flag is set, indicating a degraded echo

6. Level 2 FDM Data Quality Check

6.1 L2 FDM Product Format Check

Each product, retrieved and unpacked from the science server, is checked to ensure it consists of both an XML header file (.HDR) and a binary product file (.DBL).

Number of products with errors: 0

6.2 L2 FDM Product Header Analysis

For all products, a series of pre-defined checks are carried out on the MPH and SPH in order to identify any inconsistencies and/or errors raised by the ground-segment processing chain.

Number of products with errors: 25

Product	Test Failed
CS_OFFL_SIR_FDM_2_20200727T021520_20200727T022220_C001.DBL	Product filename start/stop differs slightly from start/stop validity due to rounding.
CS_OFFL_SIR_FDM_2_20200727T030134_20200727T030433_C001.DBL	Product filename start/stop differs slightly from start/stop validity due to rounding.
CS_OFFL_SIR_FDM_2_20200727T032604_20200727T033026_C001.DBL	Product filename start/stop differs slightly from start/stop validity due to rounding.
CS_OFFL_SIR_FDM_2_20200727T043410_20200727T043857_C001.DBL	Product filename start/stop differs slightly from start/stop validity due to rounding.
CS_OFFL_SIR_FDM_2_20200727T054154_20200727T054210_C001.DBL	Product filename start/stop differs slightly from start/stop validity due to rounding.
CS_OFFL_SIR_FDM_2_20200727T065231_20200727T065528_C001.DBL	Product filename start/stop differs slightly from start/stop validity due to rounding.
CS_OFFL_SIR_FDM_2_20200727T071807_20200727T072011_C001.DBL	Product filename start/stop differs slightly from start/stop validity due to rounding.
CS_OFFL_SIR_FDM_2_20200727T072117_20200727T072430_C001.DBL	FOS Predicted Orbit (MPL_ORBPRES) used instead of the DORIS Navigator Orbit (DOR_NAV).
CS_OFFL_SIR_FDM_2_20200727T072430_20200727T072747_C001.DBL	FOS Predicted Orbit (MPL_ORBPRES) used instead of the DORIS Navigator Orbit (DOR_NAV).
CS_OFFL_SIR_FDM_2_20200727T090048_20200727T090141_C001.DBL	FOS Predicted Orbit (MPL_ORBPRES) used instead of the DORIS Navigator Orbit (DOR_NAV).
CS_OFFL_SIR_FDM_2_20200727T090141_20200727T090158_C001.DBL	FOS Predicted Orbit (MPL_ORBPRES) used instead of the DORIS Navigator Orbit (DOR_NAV).
CS_OFFL_SIR_FDM_2_20200727T104036_20200727T104050_C001.DBL	FOS Predicted Orbit (MPL_ORBPRES) used instead of the DORIS Navigator Orbit (DOR_NAV).
CS_OFFL_SIR_FDM_2_20200727T104050_20200727T104108_C001.DBL	FOS Predicted Orbit (MPL_ORBPRES) used instead of the DORIS Navigator Orbit (DOR_NAV).
CS_OFFL_SIR_FDM_2_20200727T123708_20200727T131214_C001.DBL	Product filename start/stop differs slightly from start/stop validity due to rounding.
CS_OFFL_SIR_FDM_2_20200727T140329_20200727T140651_C001.DBL	FOS Predicted Orbit (MPL_ORBPRES) used instead of the DORIS Navigator Orbit (DOR_NAV).
CS_OFFL_SIR_FDM_2_20200727T140651_20200727T140721_C001.DBL	FOS Predicted Orbit (MPL_ORBPRES) used instead of the DORIS Navigator Orbit (DOR_NAV).
CS_OFFL_SIR_FDM_2_20200727T163336_20200727T163835_C001.DBL	Product filename start/stop differs slightly from start/stop validity due to rounding.
CS_OFFL_SIR_FDM_2_20200727T172123_20200727T172200_C001.DBL	Product filename start/stop differs slightly from start/stop validity due to rounding.
CS_OFFL_SIR_FDM_2_20200727T185015_20200727T185315_C001.DBL	Product filename start/stop differs slightly from start/stop validity due to rounding.
CS_OFFL_SIR_FDM_2_20200727T192314_20200727T194904_C001.DBL	Product filename start/stop differs slightly from start/stop validity due to rounding.
CS_OFFL_SIR_FDM_2_20200727T195715_20200727T200042_C001.DBL	Product filename start/stop differs slightly from start/stop validity due to rounding.
CS_OFFL_SIR_FDM_2_20200727T211432_20200727T212005_C001.DBL	Product filename start/stop differs slightly from start/stop validity due to rounding.
CS_OFFL_SIR_FDM_2_20200727T213203_20200727T213740_C001.DBL	Product filename start/stop differs slightly from start/stop validity due to rounding.
CS_OFFL_SIR_FDM_2_20200727T213905_20200727T213942_C001.DBL	Product filename start/stop differs slightly from start/stop validity due to rounding.
CS_OFFL_SIR_FDM_2_20200727T214510_20200727T221742_C001.DBL	Product filename start/stop differs slightly from start/stop validity due to rounding.

6.3 L2 FDM Auxiliary Data File Usage Check

Each product is checked for missing Data Set Descriptors with respect to a pre-determined baseline and also to check the validity of Auxiliary Data Files is correct.

Number of products with errors: 145

Product	AUX File	Comment
145 SIR_FDM_2_ products from 2020/07/27 00:03:24 until 2020/07/27 22:17:42	Ionospheric Correction	Due to a missing Forecast Auxiliary File there is an error with the Ionospheric Correction

6.4 L2 FDM Auxiliary Correction Error Check

Each product is checked to detect auxiliary corrections flagged by the ground-station processing chain as missing or containing errors.

Number of products with errors: 145

Product	Test Failed	Description
145 SIR_FDM_2_ products from 2020/07/27 00:03:24 until 2020/07/27 22:17:42	Ionospheric Correction	Due to a missing Forecast Auxiliary File there is an error with the Ionospheric Correction
CS_OFFL_SIR_FDM_2_20200727T024345_20200727T024938_C001	Sea State Bias Correction	There is an error with the Sea State Bias Correction for one or more records
CS_OFFL_SIR_FDM_2_20200727T033306_20200727T033914_C001	Sea State Bias Correction	There is an error with the Sea State Bias Correction for one or more records

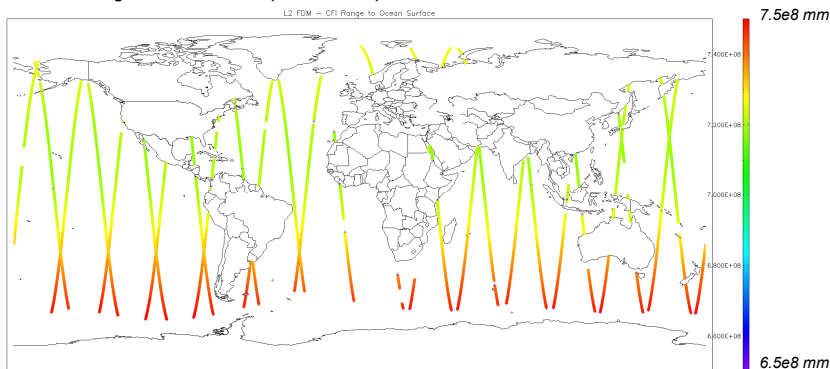
CS_OFFL_SIR_FDM_2_20200727T120236_20200727T120853_C001	Ocean Retracking Quality Flag	The Ocean Retracking Quality Flag is set indicating the CFI Ocean Retracker was not successfully executed for one or more records.
CS_OFFL_SIR_FDM_2_20200727T121028_20200727T121510_C001	Ocean Retracking Quality Flag	The Ocean Retracking Quality Flag is set indicating the CFI Ocean Retracker was not successfully executed for one or more records.
CS_OFFL_SIR_FDM_2_20200727T123708_20200727T131214_C001	Ocean Retracking Quality Flag	The Ocean Retracking Quality Flag is set indicating the CFI Ocean Retracker was not successfully executed for one or more records.
CS_OFFL_SIR_FDM_2_20200727T133128_20200727T140150_C001	Ocean Retracking Quality Flag	The Ocean Retracking Quality Flag is set indicating the CFI Ocean Retracker was not successfully executed for one or more records.
CS_OFFL_SIR_FDM_2_20200727T141536_20200727T142114_C001	Ocean Retracking Quality Flag	The Ocean Retracking Quality Flag is set indicating the CFI Ocean Retracker was not successfully executed for one or more records.
CS_OFFL_SIR_FDM_2_20200727T142121_20200727T143445_C001	Ocean Retracking Quality Flag	The Ocean Retracking Quality Flag is set indicating the CFI Ocean Retracker was not successfully executed for one or more records.
CS_OFFL_SIR_FDM_2_20200727T143649_20200727T145147_C001	Ocean Retracking Quality Flag	The Ocean Retracking Quality Flag is set indicating the CFI Ocean Retracker was not successfully executed for one or more records.
CS_OFFL_SIR_FDM_2_20200727T150850_20200727T151905_C001	Ocean Retracking Quality Flag	The Ocean Retracking Quality Flag is set indicating the CFI Ocean Retracker was not successfully executed for one or more records.
CS_OFFL_SIR_FDM_2_20200727T152524_20200727T154021_C001	Ocean Retracking Quality Flag	The Ocean Retracking Quality Flag is set indicating the CFI Ocean Retracker was not successfully executed for one or more records.
CS_OFFL_SIR_FDM_2_20200727T155427_20200727T160915_C001	Ocean Retracking Quality Flag	The Ocean Retracking Quality Flag is set indicating the CFI Ocean Retracker was not successfully executed for one or more records.
CS_OFFL_SIR_FDM_2_20200727T161228_20200727T161510_C001	Ocean Retracking Quality Flag	The Ocean Retracking Quality Flag is set indicating the CFI Ocean Retracker was not successfully executed for one or more records.
CS_OFFL_SIR_FDM_2_20200727T164638_20200727T171850_C001	Ocean Retracking Quality Flag	The Ocean Retracking Quality Flag is set indicating the CFI Ocean Retracker was not successfully executed for one or more records.
CS_OFFL_SIR_FDM_2_20200727T174820_20200727T180858_C001	Ocean Retracking Quality Flag	The Ocean Retracking Quality Flag is set indicating the CFI Ocean Retracker was not successfully executed for one or more records.
CS_OFFL_SIR_FDM_2_20200727T182505_20200727T185012_C001	Ocean Retracking Quality Flag	The Ocean Retracking Quality Flag is set indicating the CFI Ocean Retracker was not successfully executed for one or more records.
CS_OFFL_SIR_FDM_2_20200727T185015_20200727T185315_C001	Ocean Retracking Quality Flag	The Ocean Retracking Quality Flag is set indicating the CFI Ocean Retracker was not successfully executed for one or more records.
CS_OFFL_SIR_FDM_2_20200727T192314_20200727T194904_C001	Ocean Retracking Quality Flag	The Ocean Retracking Quality Flag is set indicating the CFI Ocean Retracker was not successfully executed for one or more records.
CS_OFFL_SIR_FDM_2_20200727T205042_20200727T205724_C001	Ocean Retracking Quality Flag	The Ocean Retracking Quality Flag is set indicating the CFI Ocean Retracker was not successfully executed for one or more records.
CS_OFFL_SIR_FDM_2_20200727T210103_20200727T210921_C001	Ocean Retracking Quality Flag	The Ocean Retracking Quality Flag is set indicating the CFI Ocean Retracker was not successfully executed for one or more records.
CS_OFFL_SIR_FDM_2_20200727T214510_20200727T221742_C001	Ocean Retracking Quality Flag	The Ocean Retracking Quality Flag is set indicating the CFI Ocean Retracker was not successfully executed for one or more records.

6.9 L2 Parameters Check

The following section provides plots and statistics of some key science parameters extracted from the L2 products.

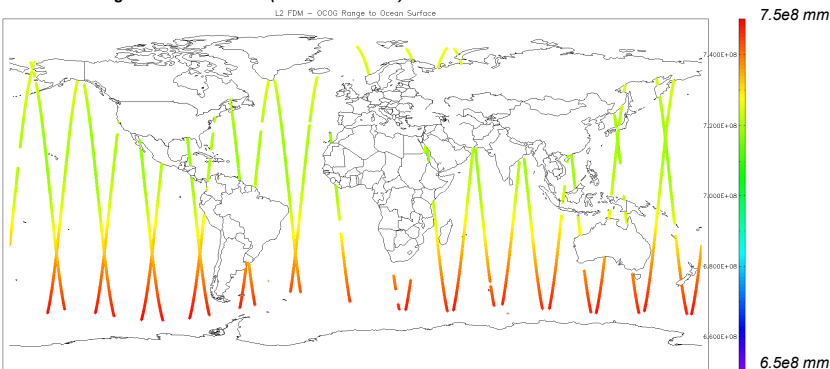
Range to Ocean Surface (1 Hz)

L2 FDM - Range to Ocean Surface (CFI Retracker)



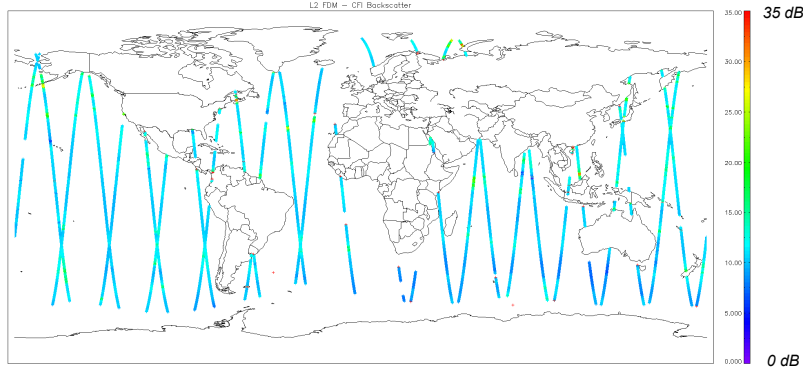
Parameter	mean (km)	st dev (km)
Range CFI (1 Hz)	727.83	33.66
Range OCOG (1 Hz)	729.19	11.81

L2 FDM - Range to Ocean Surface (OCOG Retracker)



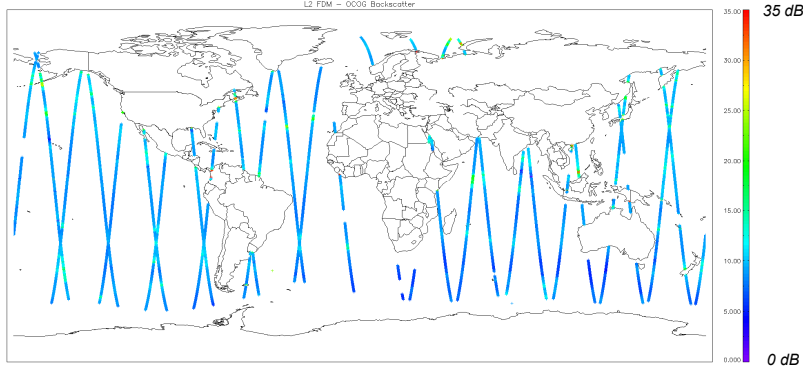
Backscatter (1 Hz)

L2 FDM - Backscatter (CFI Retracker)



Parameter	mean (dB)	st dev. (dB)
Backscatter CFI (1 Hz)	11.11	14.2
Backscatter OCOG (1 Hz)	8.76	2.72

L2 FDM - Backscatter (OCOG Retracker)



7. QCC Report Analysis

The Quality Control for CryoSat (QCC) facility performs a primary survey of data products immediately after production by the PDS and LTA processing facilities. A list of the tests which raised errors or warnings is provided below.

Product type	Nb. Products	Nb. QCC Reports	Nb. Valid	Nb. Warnings	Nb. Errors
SIR1LRM_0_	147	147	147	0	0
SIR1SAR_0_	107	107	107	0	0
SIR1SIN_0_	105	105	105	0	0
SIR2SIN_0_	105	105	105	0	0
SIR_FDM_1B	147	147	4	0	143
SIR_FDM_2	145	145	82	63	0

7.1 QCC Errors

Number of QCC reports with errors: 143

Total number of occurrences of each error

Product Type	UVOB	-	-	-	-	-	-	-	-	-
SIR_FDM_1B	143									

Test Description Key:

Abbreviation	Test name	Details
UVOB	UnitVectorOrBlank_6	The three array elements should form a unit vector (using a scale factor of 10 ⁻⁶)

7.2 QCC Warnings

Number of QCC reports with warnings: 212

Total number of occurrences of each warning

Product Type	MVSIO	MVSIOFD	RAGCOFOFD	RBSZO	RBSZOFD	RSSBCO	-	-	-	-
SIR_FDM_1B	0	0	1	0	0	0				
SIR_FDM_2_	63.00	43.00	0.00	37.00	51.00	17.00				

Test Description Key:

Abbreviation	Test name	Details
MVSIO	MissingValueShortIntOcean	The value should not be a 'missing value' for surface type 0 only
MVSIOFD	MissingValueShortIntOceanFD2	The value should not be a 'missing value' for surface type 0 only
RAGCOFOFD	RangeAGCOFlaggedOceanFD3	The AGC should be between 0 and 6200 or the AGC_inconsistency flag should be set for surface type = ocean
RBSZO	RangeBackscatterSigmaZeroOcean	The backscatter sigma zero should be between 700 and 3000 (or missing) for surface type = ocean
RBSZOFD	RangeBackscatterSigmaZeroOceanFD2	The backscatter sigma zero should be between 700 and 3000 (or missing) for surface type = ocean
RSSBCO	RangeSeaStateBiasCorrectionOcean	The sea state bias correction should be between -500mm and 0mm (or missing) for surface type = ocean

7.3 Missing QCC Reports

Number of products with missing QCC reports: 0