

**1. Overview**

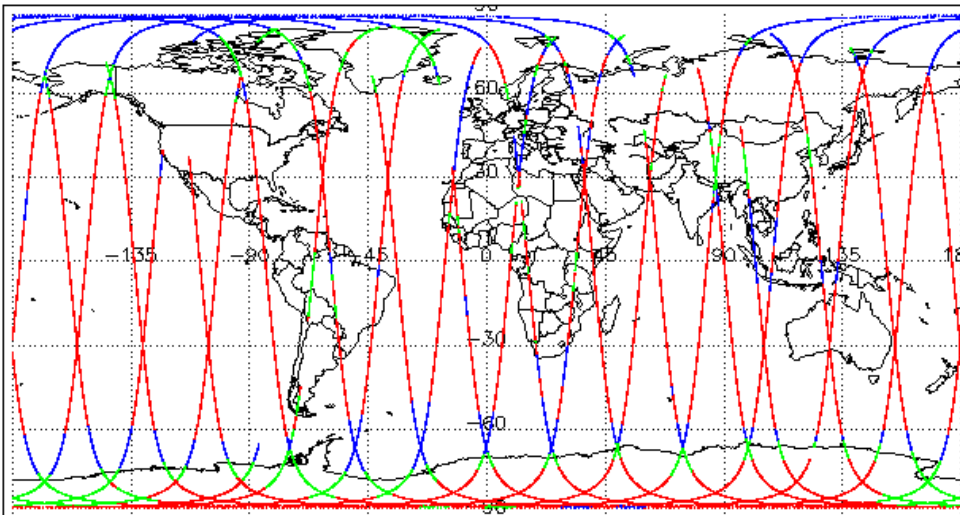
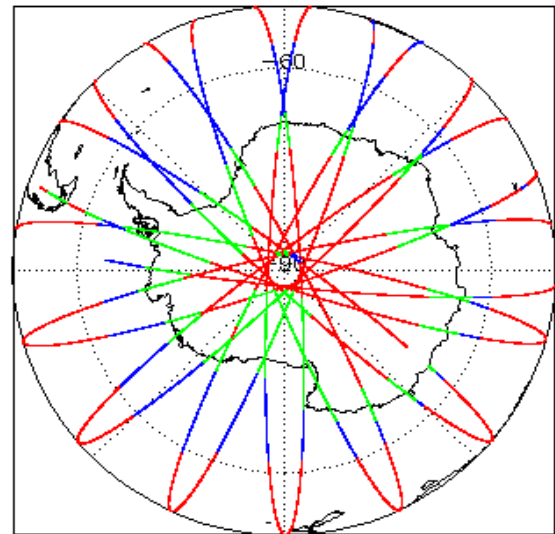
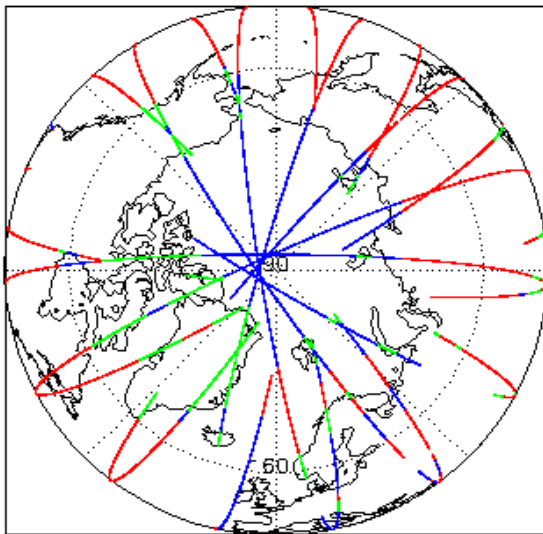
|                           |                                                              |
|---------------------------|--------------------------------------------------------------|
| <b>Report Production:</b> | 03-Nov-2020                                                  |
| <b>Processor Used:</b>    | CryoSat Ocean Processor                                      |
| <b>Data Used:</b>         | Near Real Time Ocean Products (NOP)<br>L1B & L2 Science Data |

| Check                                     | L1 & L2                      |
|-------------------------------------------|------------------------------|
| 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                   | Nominal                      |
| Auxiliary Data File Usage Check           | Nominal                      |
| Auxiliary Correction Error Check          | See Section 5.4              |
| Measurement Confidence Data Check         | See Section 4.5, 4.6 and 5.5 |
| Measurement Quality Flag Check            | See Section 5.6              |
| Ocean Retracking Quality Check            | See Section 5.7              |
| QCC Error/ Warning Check                  | See Section 7.1 and 7.2      |

**Mission / Instrument News**

|             |                 |
|-------------|-----------------|
| 01-Nov-2020 | None            |
| 02-Nov-2020 | None            |
| 03-Nov-2020 | Nothing planned |

**2. Global Coverage**



**Mode Coverage**

|  |       |
|--|-------|
|  | LRM   |
|  | SAR   |
|  | SARIn |

**3. Instrument Configuration**

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

|                                    |                |
|------------------------------------|----------------|
| <b>SIRAL instrument(s) in use:</b> | SIRAL - A      |
| <b>Star Tracker(s) in use:</b>     | Star Tracker 1 |

**4. NOP Level 1B Data Quality Check**

**4.1 L1B 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 L1B Product Header Analysis

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

**L1B Processing Quality HR:** The l1b\_proc\_flag\_hr flag is currently set all L1B IOPR and IOPN products because the l1b\_processing\_quality\_hr field is not correctly configured in the OSAR and OSARIn chains. A modification is required in the next release.

Number of products with errors: 0

## 4.3 L1B 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.

**Dynamic Atmospheric Correction:** The DAC is missing in all products because the auxiliary files required are not available in time for processing. This known and expected behaviour.

Number of products with errors: 0

## 4.4 L1B Auxiliary Correction Error Check

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

Number of products with errors: 0

## 4.5 L1B Measurement Confidence Data Check

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

> **Attitude Correction Missing:** This flag is currently set in error for NOPR products due to a configuration issue. This is being investigated and will be updated in the next SW update.

Number of products with errors: 1

| Product                                                 | Test Failed         | Description                                                                  |
|---------------------------------------------------------|---------------------|------------------------------------------------------------------------------|
| CS_OFFL_SIR_NOPM1B_20201102T223823_20201102T225615_C001 | Power scaling error | There is an error in the scaling of the L1B waveform for one or more records |

## 4.6 L1B Waveform Group Data Check

CryoSat L1B data includes a waveform data flag for each measurement record. The bit value of this flag indicates any problems when set.

> **Loss of Echo Flag:** This flag is currently set for products over land, but this is to be expected.

Number of products with errors: 10

| Product                                                 | Test Failed  | Description                                          |
|---------------------------------------------------------|--------------|------------------------------------------------------|
| CS_OFFL_SIR_NOPM1B_20201102T094506_20201102T100021_C001 | Loss of Echo | The tracking echo is missing for one or more records |
| CS_OFFL_SIR_NOPN1B_20201102T010353_20201102T010511_C001 | Loss of Echo | The tracking echo is missing for one or more records |
| CS_OFFL_SIR_NOPN1B_20201102T042739_20201102T042900_C001 | Loss of Echo | The tracking echo is missing for one or more records |
| CS_OFFL_SIR_NOPN1B_20201102T064416_20201102T064826_C001 | Loss of Echo | The tracking echo is missing for one or more records |
| CS_OFFL_SIR_NOPN1B_20201102T105337_20201102T105550_C001 | Loss of Echo | The tracking echo is missing for one or more records |
| CS_OFFL_SIR_NOPN1B_20201102T123933_20201102T124007_C001 | Loss of Echo | The tracking echo is missing for one or more records |
| CS_OFFL_SIR_NOPN1B_20201102T205453_20201102T205919_C001 | Loss of Echo | The tracking echo is missing for one or more records |
| CS_OFFL_SIR_NOPN1B_20201102T223354_20201102T223505_C001 | Loss of Echo | The tracking echo is missing for one or more records |
| CS_OFFL_SIR_NOPN1B_20201102T231018_20201102T231213_C001 | Loss of Echo | The tracking echo is missing for one or more records |
| CS_OFFL_SIR_NOPR1B_20201102T064150_20201102T064416_C001 | Loss of Echo | The tracking echo is missing for one or more records |

## 5. NOP Level 2 Data Quality Check

### 5.1 L2 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 L2 Product Header Analysis

For all products, a series of pre-defined checks are performed 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: 0

### 5.3 L2 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.

**Wind Model File Usage:** This file is currently not included in all L2 products.

Number of products with errors: 0

### 5.4 L2 Auxiliary Correction Error Check

For all products, the auxiliary corrections within the Geophysical Group are checked for the default error value (32767).

**Currently, there are some common auxiliary correction errors raised in the Level 2 products which are expected due to surface type. All common flags are summarised in the list below, followed by a table highlighting any additional issues which may arise from this test.**

> **ECMWF Meteo Corrections:** Currently the following corrections are not computed over CONTINENTAL ICE: Dry Tropospheric Correction, Wet Tropospheric Correction, Inverse Barometric Correction and the U-Wind and V-Wind components of the ECMWF model wind vector. This is a known anomaly (CRYO-COP-3) and will be resolved in a future IPF update.

> **Mean Sea Surface:** The error value is currently set for products over land and sea ice, but this is to be expected.

> **Mean Dynamic Topography:** The error value is currently set for products over land and sea ice, but this is to be expected.

> **Altimetric Wind Speed Error:** The error value is currently set for products over land and sea ice, but this is to be expected.

Number of products with errors: 46

| Product                                                 | Test Failed                                                    | Description                                                                                                                                   |
|---------------------------------------------------------|----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| CS_OFFL_SIR_NOPM_2_20201102T103342_20201102T104940_C001 | Mean Dynamic Topography (1), Total Geocentric Ocean Tide (GOT) | There is an error with the Mean Dynamic Topography (solution 1) and the Total Geocentric Ocean Tide (solution 1: GOT) for one or more records |



|                                                         |                                                                                                                                           |                                                                                                                                                                                                               |
|---------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CS_OFFL_SIR_NOPR_2_20201102T055629_20201102T060541_C001 | Mean Sea Surface (1), Mean Dynamic Topography (1)                                                                                         | There is an error with the MSS height (solution 1) and the Mean Dynamic Topography height (solution 1) for one or more records                                                                                |
| CS_OFFL_SIR_NOPR_2_20201102T073737_20201102T073852_C001 | Mean Sea Surface (1), Mean Dynamic Topography (1)                                                                                         | There is an error with the MSS height (solution 1) and the Mean Dynamic Topography height (solution 1) for one or more records                                                                                |
| CS_OFFL_SIR_NOPR_2_20201102T073852_20201102T074500_C001 | Mean Sea Surface (1), Mean Dynamic Topography (1)                                                                                         | There is an error with the MSS height (solution 1) and the Mean Dynamic Topography height (solution 1) for one or more records                                                                                |
| CS_OFFL_SIR_NOPR_2_20201102T091634_20201102T092215_C001 | Mean Sea Surface (1), Mean Dynamic Topography (1)                                                                                         | There is an error with the MSS height (solution 1) and the Mean Dynamic Topography height (solution 1) for one or more records                                                                                |
| CS_OFFL_SIR_NOPR_2_20201102T092229_20201102T092345_C001 | Mean Dynamic Topography (1)                                                                                                               | There is an error with the Mean Dynamic Topography height for one or more records                                                                                                                             |
| CS_OFFL_SIR_NOPR_2_20201102T105550_20201102T105652_C001 | Mean Sea Surface (1), Mean Dynamic Topography (1)                                                                                         | There is an error with the MSS height (solution 1) and the Mean Dynamic Topography height (solution 1) for one or more records                                                                                |
| CS_OFFL_SIR_NOPR_2_20201102T105653_20201102T110239_C001 | Mean Sea Surface (1), Mean Dynamic Topography (1)                                                                                         | There is an error with the MSS height (solution 1) and the Mean Dynamic Topography height (solution 1) for one or more records                                                                                |
| CS_OFFL_SIR_NOPR_2_20201102T122802_20201102T122941_C001 | Mean Dynamic Topography (1), Total Geocentric Ocean Tide (GOT), Total Geocentric Ocean Tide (FES), Non-Equilibrium Long Period Ocean Tide | There is an error with the Mean Dynamic Topography (solution 1), the Total Geocentric Ocean Tide (solution 1: GOT and solution 2: FES) and the Non-Equilibrium Long Period Ocean Tide for one or more records |
| CS_OFFL_SIR_NOPR_2_20201102T123414_20201102T123933_C001 | Mean Sea Surface (1), Mean Dynamic Topography (1)                                                                                         | There is an error with the MSS height (solution 1) and the Mean Dynamic Topography height (solution 1) for one or more records                                                                                |
| CS_OFFL_SIR_NOPR_2_20201102T160703_20201102T160735_C001 | Mean Dynamic Topography (1)                                                                                                               | There is an error with the Mean Dynamic Topography height for one or more records                                                                                                                             |
| CS_OFFL_SIR_NOPR_2_20201102T160748_20201102T160859_C001 | Mean Dynamic Topography (1)                                                                                                               | There is an error with the Mean Dynamic Topography height for one or more records                                                                                                                             |
| CS_OFFL_SIR_NOPR_2_20201102T222720_20201102T222957_C001 | Mean Dynamic Topography (1)                                                                                                               | There is an error with the Mean Dynamic Topography height for one or more records                                                                                                                             |
| CS_OFFL_SIR_NOPR_2_20201102T234502_20201102T234751_C001 | Mean Dynamic Topography (1)                                                                                                               | There is an error with the Mean Dynamic Topography height for one or more records                                                                                                                             |

## 5.5 L2 Measurement Confidence Data Check

CryoSat L2 data includes a measurement confidence flag for each 20-Hz measurement record. The bit value of this flag indicates any problems when set.

**Number of products with errors:** 1

| Product                                               | Test Failed         | Description                                                                 |
|-------------------------------------------------------|---------------------|-----------------------------------------------------------------------------|
| CS_OFFL_SIR_NOPM_2_20201102T23823_20201102T25615_C001 | Power scaling error | There is an error in the scaling of the L2 waveform for one or more records |

## 5.6 L2 Measurement Quality Flag Check

### L2 Quality Flags (20Hz)

CryoSat L2 data includes Quality Flags for each 20 Hz, 20 Hz PLRM and 1 Hz measurement record. The bit value of this flag indicates any problems when set.

Currently, there are several common flags raised in the Level 2 products, which are summarised below. The table provides the full list of products flagged.

> **Ocean Altimeter Range, SSHA, SWH and Backscatter Quality Flags:** These flags are currently set for some records over ocean.

> **OCOG Altimeter Range and Backscatter Quality Flags:** These flags are currently set for some records over continental ice.

**Number of products with errors:** 85

| Product                                                 | Test Failed                                                                                            | Description                                                                                                                                                          |
|---------------------------------------------------------|--------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CS_OFFL_SIR_NOPM_2_20201102T000913_20201102T001750_C001 | OCOG Altimeter Range Quality, OCOG Backscatter Quality                                                 | The OCOG Altimeter Range and Backscatter Quality Flags have been set for one or more records.                                                                        |
| CS_OFFL_SIR_NOPM_2_20201102T002053_20201102T004252_C001 | Ocean Altimeter Range, SSHA, SWH and Backscatter Quality, OCOG Altimeter Range and Backscatter Quality | The Ocean Altimeter Range, SSHA, SWH and Backscatter Quality Flags and the OCOG Altimeter Range and Backscatter Quality Flags have been set for one or more records. |
| CS_OFFL_SIR_NOPM_2_20201102T012054_20201102T014428_C001 | Ocean Altimeter Range, SSHA, SWH and Backscatter Quality, OCOG Altimeter Range and Backscatter Quality | The Ocean Altimeter Range, SSHA, SWH and Backscatter Quality Flags and the OCOG Altimeter Range and Backscatter Quality Flags have been set for one or more records. |
| CS_OFFL_SIR_NOPM_2_20201102T015115_20201102T015550_C001 | OCOG Altimeter Range Quality, OCOG Backscatter Quality                                                 | The OCOG Altimeter Range and Backscatter Quality Flags have been set for one or more records.                                                                        |
| CS_OFFL_SIR_NOPM_2_20201102T020036_20201102T020331_C001 | Ocean Altimeter Range, SSHA, SWH and Backscatter Quality, OCOG Altimeter Range and Backscatter Quality | The Ocean Altimeter Range, SSHA, SWH and Backscatter Quality Flags and the OCOG Altimeter Range and Backscatter Quality Flags have been set for one or more records. |
| CS_OFFL_SIR_NOPM_2_20201102T020417_20201102T022410_C001 | Ocean Altimeter Range, SSHA, SWH and Backscatter Quality, OCOG Altimeter Range and Backscatter Quality | The Ocean Altimeter Range, SSHA, SWH and Backscatter Quality Flags and the OCOG Altimeter Range and Backscatter Quality Flags have been set for one or more records. |
| CS_OFFL_SIR_NOPM_2_20201102T025739_20201102T032223_C001 | Ocean Altimeter Range, SSHA, SWH and Backscatter Quality, OCOG Altimeter Range and Backscatter Quality | The Ocean Altimeter Range, SSHA, SWH and Backscatter Quality Flags and the OCOG Altimeter Range and Backscatter Quality Flags have been set for one or more records. |
| CS_OFFL_SIR_NOPM_2_20201102T033033_20201102T033627_C001 | OCOG Altimeter Range Quality, OCOG Backscatter Quality                                                 | The OCOG Altimeter Range and Backscatter Quality Flags have been set for one or more records.                                                                        |
| CS_OFFL_SIR_NOPM_2_20201102T033948_20201102T035740_C001 | Ocean Altimeter Range, SSHA, SWH and Backscatter Quality, OCOG Altimeter Range and Backscatter Quality | The Ocean Altimeter Range, SSHA, SWH and Backscatter Quality Flags and the OCOG Altimeter Range and Backscatter Quality Flags have been set for one or more records. |
| CS_OFFL_SIR_NOPM_2_20201102T040020_20201102T040301_C001 | Ocean Altimeter Range, SSHA, SWH and Backscatter Quality, OCOG Altimeter Range and Backscatter Quality | The Ocean Altimeter Range, SSHA, SWH and Backscatter Quality Flags and the OCOG Altimeter Range and Backscatter Quality Flags have been set for one or more records. |







|                                                         |                                                                                                        |                                                                                                                                                                      |
|---------------------------------------------------------|--------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CS_OFFL_SIR_NOPM_2_20201102T214110_20201102T214309_C001 | OCOG Altimeter Range Quality, OCOG Backscatter Quality                                                 | The OCOG Altimeter Range and Backscatter Quality Flags have been set for one or more records.                                                                        |
| CS_OFFL_SIR_NOPM_2_20201102T214423_20201102T214811_C001 | OCOG Altimeter Range Quality, OCOG Backscatter Quality                                                 | The OCOG Altimeter Range and Backscatter Quality Flags have been set for one or more records.                                                                        |
| CS_OFFL_SIR_NOPM_2_20201102T215021_20201102T220532_C001 | Ocean Altimeter Range, SSHA, SWH and Backscatter Quality, OCOG Altimeter Range and Backscatter Quality | The Ocean Altimeter Range, SSHA, SWH and Backscatter Quality Flags and the OCOG Altimeter Range and Backscatter Quality Flags have been set for one or more records. |
| CS_OFFL_SIR_NOPM_2_20201102T220733_20201102T221656_C001 | Ocean Altimeter Range, SSHA, SWH and Backscatter Quality, OCOG Altimeter Range and Backscatter Quality | The Ocean Altimeter Range, SSHA, SWH and Backscatter Quality Flags and the OCOG Altimeter Range and Backscatter Quality Flags have been set for one or more records. |
| CS_OFFL_SIR_NOPM_2_20201102T222228_20201102T222234_C001 | OCOG Altimeter Range Quality, OCOG Backscatter Quality                                                 | The OCOG Altimeter Range and Backscatter Quality Flags have been set for one or more records.                                                                        |
| CS_OFFL_SIR_NOPM_2_20201102T222241_20201102T222720_C001 | OCOG Altimeter Range Quality, OCOG Backscatter Quality                                                 | The OCOG Altimeter Range and Backscatter Quality Flags have been set for one or more records.                                                                        |
| CS_OFFL_SIR_NOPM_2_20201102T223823_20201102T225615_C001 | Ocean Altimeter Range, SSHA, SWH and Backscatter Quality, OCOG Altimeter Range and Backscatter Quality | The Ocean Altimeter Range, SSHA, SWH and Backscatter Quality Flags and the OCOG Altimeter Range and Backscatter Quality Flags have been set for one or more records. |
| CS_OFFL_SIR_NOPM_2_20201102T230919_20201102T231018_C001 | OCOG Altimeter Range Quality, OCOG Backscatter Quality                                                 | The OCOG Altimeter Range and Backscatter Quality Flags have been set for one or more records.                                                                        |
| CS_OFFL_SIR_NOPM_2_20201102T231213_20201102T231337_C001 | Ocean Altimeter Range, SSHA, SWH and Backscatter Quality, OCOG Altimeter Range and Backscatter Quality | The Ocean Altimeter Range, SSHA, SWH and Backscatter Quality Flags and the OCOG Altimeter Range and Backscatter Quality Flags have been set for one or more records. |
| CS_OFFL_SIR_NOPM_2_20201102T231430_20201102T231438_C001 | Ocean Altimeter Range, SSHA, SWH and Backscatter Quality, OCOG Altimeter Range and Backscatter Quality | The Ocean Altimeter Range, SSHA, SWH and Backscatter Quality Flags and the OCOG Altimeter Range and Backscatter Quality Flags have been set for one or more records. |
| CS_OFFL_SIR_NOPM_2_20201102T231922_20201102T232714_C001 | OCOG Altimeter Range Quality, OCOG Backscatter Quality                                                 | The OCOG Altimeter Range and Backscatter Quality Flags have been set for one or more records.                                                                        |
| CS_OFFL_SIR_NOPM_2_20201102T233014_20201102T234438_C001 | Ocean Altimeter Range, SSHA, SWH and Backscatter Quality, OCOG Altimeter Range and Backscatter Quality | The Ocean Altimeter Range, SSHA, SWH and Backscatter Quality Flags and the OCOG Altimeter Range and Backscatter Quality Flags have been set for one or more records. |
| CS_OFFL_SIR_NOPM_2_20201102T235254_20201102T235400_C001 | OCOG Altimeter Range Quality, OCOG Backscatter Quality                                                 | The OCOG Altimeter Range and Backscatter Quality Flags have been set for one or more records.                                                                        |
| CS_OFFL_SIR_NOPM_2_20201102T235753_20201102T235908_C001 | OCOG Altimeter Range Quality, OCOG Backscatter Quality                                                 | The OCOG Altimeter Range and Backscatter Quality Flags have been set for one or more records.                                                                        |
| CS_OFFL_SIR_NOPN_2_20201102T001751_20201102T001952_C001 | Ocean Altimeter Range, SSHA, SWH and Backscatter Quality, OCOG Altimeter Range and Backscatter Quality | The Ocean Altimeter Range, SSHA, SWH and Backscatter Quality Flags and the OCOG Altimeter Range and Backscatter Quality Flags have been set for one or more records. |
| CS_OFFL_SIR_NOPN_2_20201102T100945_20201102T101202_C001 | Ocean Altimeter Range, SSHA, SWH and Backscatter Quality, OCOG Altimeter Range and Backscatter Quality | The Ocean Altimeter Range, SSHA, SWH and Backscatter Quality Flags and the OCOG Altimeter Range and Backscatter Quality Flags have been set for one or more records. |
| CS_OFFL_SIR_NOPN_2_20201102T125055_20201102T125429_C001 | OCOG Altimeter Range Quality, OCOG Backscatter Quality                                                 | The OCOG Altimeter Range and Backscatter Quality Flags have been set for one or more records.                                                                        |
| CS_OFFL_SIR_NOPN_2_20201102T155744_20201102T155808_C001 | Ocean Altimeter Range, SSHA, SWH and Backscatter Quality, OCOG Altimeter Range and Backscatter Quality | The Ocean Altimeter Range, SSHA, SWH and Backscatter Quality Flags and the OCOG Altimeter Range and Backscatter Quality Flags have been set for one or more records. |
| CS_OFFL_SIR_NOPR_2_20201102T005029_20201102T005100_C001 | OCOG Altimeter Range Quality, OCOG Backscatter Quality                                                 | The OCOG Altimeter Range and Backscatter Quality Flags have been set for one or more records.                                                                        |
| CS_OFFL_SIR_NOPR_2_20201102T010953_20201102T011038_C001 | OCOG Altimeter Range Quality, OCOG Backscatter Quality                                                 | The OCOG Altimeter Range and Backscatter Quality Flags have been set for one or more records.                                                                        |
| CS_OFFL_SIR_NOPR_2_20201102T041635_20201102T041740_C001 | OCOG Altimeter Range Quality, OCOG Backscatter Quality                                                 | The OCOG Altimeter Range and Backscatter Quality Flags have been set for one or more records.                                                                        |
| CS_OFFL_SIR_NOPR_2_20201102T041806_20201102T042600_C001 | Ocean Altimeter Range, SSHA, SWH and Backscatter Quality, OCOG Altimeter Range and Backscatter Quality | The Ocean Altimeter Range, SSHA, SWH and Backscatter Quality Flags and the OCOG Altimeter Range and Backscatter Quality Flags have been set for one or more records. |
| CS_OFFL_SIR_NOPR_2_20201102T074504_20201102T074507_C001 | OCOG Altimeter Range Quality, OCOG Backscatter Quality                                                 | The OCOG Altimeter Range and Backscatter Quality Flags have been set for one or more records.                                                                        |

## L2 Quality Flags (20Hz PLRM)

Currently, there are several common flags raised in the Level 2 products, which are summarised below. The table provides the full list of products flagged.

> **Ocean Altimeter Range, SSHA, SWH and Backscatter PLRM Quality Flags:** These flags are currently set for occasional records over sea ice.

> **OCOG Altimeter Range and Backscatter PLRM Quality Flags:** These flags are currently set for occasional records over continental ice.

**Number of products with errors:** 87

| Product | Test Failed | Description |
|---------|-------------|-------------|
|---------|-------------|-------------|









|                                                         |                                                                                                                  |                                                                                                                                                                      |
|---------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CS_OFFL_SIR_NOPR_2_20201102T182804_20201102T183151_C001 | Ocean Altimeter Range, SSHA, SWH and Backscatter Quality PLRM, OCOG Altimeter Range and Backscatter Quality PLRM | The Ocean Altimeter Range, SSHA, SWH and Backscatter Quality Flags and the OCOG Altimeter Range and Backscatter Quality Flags have been set for one or more records. |
| CS_OFFL_SIR_NOPR_2_20201102T191917_20201102T192931_C001 | OCOG Altimeter Range Quality PLRM, OCOG Backscatter Quality                                                      | The OCOG Range and Backscatter Quality Flags have been set for one or more records.                                                                                  |
| CS_OFFL_SIR_NOPR_2_20201102T195224_20201102T195906_C001 | Ocean Altimeter Range, SSHA, SWH and Backscatter Quality PLRM, OCOG Altimeter Range and Backscatter Quality PLRM | The Ocean Altimeter Range, SSHA, SWH and Backscatter Quality Flags and the OCOG Altimeter Range and Backscatter Quality Flags have been set for one or more records. |
| CS_OFFL_SIR_NOPR_2_20201102T200926_20201102T201134_C001 | Ocean Altimeter Range, SSHA, SWH and Backscatter Quality PLRM, OCOG Altimeter Range and Backscatter Quality PLRM | The Ocean Altimeter Range, SSHA, SWH and Backscatter Quality Flags and the OCOG Altimeter Range and Backscatter Quality Flags have been set for one or more records. |
| CS_OFFL_SIR_NOPR_2_20201102T204742_20201102T204830_C001 | OCOG Altimeter Range Quality PLRM, OCOG Backscatter Quality                                                      | The OCOG Range and Backscatter Quality Flags have been set for one or more records.                                                                                  |
| CS_OFFL_SIR_NOPR_2_20201102T213254_20201102T213834_C001 | Ocean Altimeter Range, SSHA, SWH and Backscatter Quality PLRM, OCOG Altimeter Range and Backscatter Quality PLRM | The Ocean Altimeter Range, SSHA, SWH and Backscatter Quality Flags and the OCOG Altimeter Range and Backscatter Quality Flags have been set for one or more records. |
| CS_OFFL_SIR_NOPR_2_20201102T222720_20201102T222957_C001 | Ocean Altimeter Range, SSHA, SWH and Backscatter Quality PLRM, OCOG Altimeter Range and Backscatter Quality PLRM | The Ocean Altimeter Range, SSHA, SWH and Backscatter Quality Flags and the OCOG Altimeter Range and Backscatter Quality Flags have been set for one or more records. |
| CS_OFFL_SIR_NOPR_2_20201102T234502_20201102T234751_C001 | OCOG Altimeter Range Quality PLRM, OCOG Backscatter Quality                                                      | The OCOG Range and Backscatter Quality Flags have been set for one or more records.                                                                                  |
| CS_OFFL_SIR_NOPR_2_20201102T234809_20201102T235254_C001 | OCOG Altimeter Range Quality PLRM, OCOG Backscatter Quality                                                      | The OCOG Range and Backscatter Quality Flags have been set for one or more records.                                                                                  |

## L2 Quality Flags (1 Hz & 1Hz PLRM)

Currently, there are several common flags raised in the Level 2 products, which are summarised below.

> 1Hz and 1Hz Ocean SSHA Quality Flags: These flags are currently set for products over sea ice, which is to be expected.

Number of products with errors: 174

## 5.7 L2 Ocean Retracking Quality Check

### L2 Retracking Flags (20Hz)

CryoSat L2 data includes an ocean retracking quality flag for each 20-Hz measurement record. The bit value of this flag indicates any problems when set.

**Ocean Retracking Quality Flag:** This flag is currently set for products falling at ocean/ land boundaries, but this is expected.

Number of products with errors: 56

### L2 Retracking Flags (20Hz, PLRM)

CryoSat L2 data includes an ocean retracking quality flag for each 20-Hz PLRM measurement record. The bit value of this flag indicates any problems when set.

**Ocean Retracking Quality Flag (PLRM):** This flag is currently set for products NOPR and NOPN products over sea ice, but this is to be expected.

Number of products with errors: 136

## 7. NOP 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 | No. Products | No. QCC Reports | No. Valid | No. Warnings | No. Errors |
|--------------|--------------|-----------------|-----------|--------------|------------|
| SIR_NOPM1B   | 162          | 162             | 5         | 157          | 0          |
| SIR_NOPR1B   | 105          | 105             | 0         | 105          | 0          |
| SIR_NOPN1B   | 104          | 104             | 4         | 100          | 0          |
| SIR_NOPM_2   | 161          | 161             | 110       | 51           | 0          |
| SIR_NOPR_2   | 105          | 105             | 38        | 65           | 2          |
| SIR_NOPN_2   | 104          | 104             | 44        | 60           | 0          |

### 7.1 QCC Errors

Number of QCC reports with errors: 7

Total number of occurrences of each error

| Product Type | RLOBOPNCDF | RL | RL | RLOBOPNCDF | RL | RL | - | - | - | - |
|--------------|------------|----|----|------------|----|----|---|---|---|---|
| SIR_NOPR_2   | 2          | 1  | 2  | 2          | 1  | 2  | - | - | - | - |

#### Test Description Key:

| Abbreviation | Test name                       | Details                                               |
|--------------|---------------------------------|-------------------------------------------------------|
| RLOBOPNCDF   | RangeLatitudeOrBlankOP_7NetCDF  | Latitude should be between -90E7 and 90E7 - NetCDF    |
| RL           | RangeLatitude_6                 | Latitude should be between -90E6 and 90E6             |
| RL           | RangeLatitude_7                 | Latitude should be between -90E7 and 90E7             |
| RLOBOPNCDF   | RangeLongitudeOrBlankOP_7NetCDF | Longitude should be between -180E7 and 180E7 - NetCDF |
| RL           | RangeLongitude_6                | Longitude should be between -180E6 and 180E6          |
| RL           | RangeLongitude_7                | Longitude should be between -180E7 and 180E7          |

### 7.2 QCC Warnings

Number of QCC reports with warnings: 1716

Total number of occurrences of each warning

| Product Type | BCSHNCDF | IOHHMOOR | MVIOEPFNCDF | MVIOEPCDF | MVIONCDF | RBSZOPEPFNCDF | RBSZOPEPFPLRMNCD |
|--------------|----------|----------|-------------|-----------|----------|---------------|------------------|
| SIR_NOPM1B   | 157      | 0        | 0           | 0         | 0        | 0             | 0                |
| SIR_NOPM_2   | 0        | 0        | 35          | 34        | 2        | 40            | 0                |
| SIR_NOPN1B   | 99       | 0        | 0           | 0         | 0        | 0             | 0                |
| SIR_NOPN_2   | 0        | 0        | 10          | 30        | 8        | 26            | 29               |
| SIR_NOPR1B   | 104      | 0        | 0           | 0         | 0        | 0             | 0                |
| SIR_NOPR_2   | 0        | 2        | 40          | 47        | 1        | 33            | 30               |

| Product Type | RBSZOPEPCDF | RPEOPFPLRMNCD | RPEOPFPLRMSARNCDF | RPEOPFPLRMSINNCDF | RPEOPFDSARNCDF | RPEOPFDSINNCDF | RPEOPLRMNCD |
|--------------|-------------|---------------|-------------------|-------------------|----------------|----------------|-------------|
|--------------|-------------|---------------|-------------------|-------------------|----------------|----------------|-------------|

|            |    |    |    |    |    |    |    |
|------------|----|----|----|----|----|----|----|
| SIR_NOPM1B | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| SIR_NOPM_2 | 34 | 27 | 0  | 0  | 0  | 0  | 22 |
| SIR_NOPN1B | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| SIR_NOPN_2 | 20 | 0  | 0  | 20 | 0  | 28 | 0  |
| SIR_NOPR1B | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| SIR_NOPR_2 | 21 | 0  | 44 | 0  | 53 | 0  | 0  |

| Product Type | RPEOPSARNCDF | RPEOPSINNCDF | RSSBONCDF | RSSHAOFDNCDF | RSSHAOFDPLRMNCDF | RSSHAONCDF | RSWHOEFPDNCDF |
|--------------|--------------|--------------|-----------|--------------|------------------|------------|---------------|
| SIR_NOPM1B   | 0            | 0            | 0         | 0            | 0                | 0          | 0             |
| SIR_NOPM_2   | 0            | 0            | 9         | 27           | 0                | 6          | 35            |
| SIR_NOPN1B   | 0            | 0            | 0         | 0            | 0                | 0          | 0             |
| SIR_NOPN_2   | 0            | 24           | 21        | 40           | 48               | 29         | 28            |
| SIR_NOPR1B   | 0            | 0            | 0         | 0            | 0                | 0          | 0             |
| SIR_NOPR_2   | 46           | 0            | 2         | 59           | 41               | 8          | 40            |

| Product Type | RSWHOEFPDPLRMNCDF | RSWHOEPCDF | SPHRTASCNSCDF | SOOHIFHD | SCSTODHRNCDF | SCSTODNCDF | - |
|--------------|-------------------|------------|---------------|----------|--------------|------------|---|
| SIR_NOPM1B   | 0                 | 0          | 1             | 0        | 0            | 3          |   |
| SIR_NOPM_2   | 0                 | 5          | 1             | 0        | 0            | 0          |   |
| SIR_NOPN1B   | 0                 | 0          | 0             | 0        | 41           | 1          |   |
| SIR_NOPN_2   | 28                | 13         | 0             | 0        | 0            | 0          |   |
| SIR_NOPR1B   | 0                 | 0          | 0             | 0        | 105          | 2          |   |
| SIR_NOPR_2   | 49                | 4          | 1             | 3        | 0            | 0          |   |

| Test Description Key: |                                                             |                                                                                                                                              |
|-----------------------|-------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| Abbreviation          | Test name                                                   | Details                                                                                                                                      |
| BCSHNCDF              | BurstCounterStep20HzNetCDF                                  | The burst counter should be one higher with regard to the previous burst counter                                                             |
| IOHHMOOR              | IndexOf1Hzin20HzMappingOutOfRange                           | The mapping of 20 Hz to 1 Hz measurements should be in the range 0 to (number of 1 Hz samples - 1)                                           |
| MVIOEFPDNCDF          | MissingValueIntOceanExcludingPolarFD2NetCDF                 | The value should not be a 'missing value' for surface type 0 only for latitudes between -70 and 70 degrees                                   |
| MVIOEPNCDF            | MissingValueIntOceanExcludingPolarNetCDF                    | The value should not be a 'missing value' for surface type 0 only for latitudes between -70 and 70 degrees                                   |
| MVIONCDF              | MissingValueIntOceanNetCDF                                  | The value should not be a 'missing value' for surface type 0 only                                                                            |
| RBSZOPEPFNCDF         | RangeBackscatterSigmaZeroOPOceanExcludingPolarFD2NetCDF     | The backscatter sigma zero should be between 700 and 7500 (or missing) for surface type = ocean for latitudes between -70 and 70 degrees     |
| RBSZOPEPFPLRMNCDF     | RangeBackscatterSigmaZeroOPOceanExcludingPolarFD2PLRMNetCDF | The backscatter sigma zero should be between 700 and 7500 (or missing) for surface type = ocean for latitudes between -70 and 70 degrees     |
| RBSZOPEPCDF           | RangeBackscatterSigmaZeroOPOceanExcludingPolarNetCDF        | The backscatter sigma zero should be between 700 and 7500 (or missing) for surface type = ocean for latitudes between -70 and 70 degrees     |
| RPEOPFDLRMNCDF        | RangePeakinessExcludingPolarOPFD2LRMNetCDF                  | The Peakiness should be between 0 and 6400 (or missing) for surface type = ocean for latitudes between -70 and 70 degrees                    |
| RPEOPFDPLRMSARNCDF    | RangePeakinessExcludingPolarOPFD2PLRMSARNNetCDF             | The Peakiness should be between 0 and 15000 (or missing) for surface type = ocean for latitudes between -70 and 70 degrees                   |
| RPEOPFDPLRMSINNCDF    | RangePeakinessExcludingPolarOPFD2PLRMSINNetCDF              | The Peakiness should be between 0 and 90000 (or missing) for surface type = ocean for latitudes between -70 and 70 degrees                   |
| RPEOPFDSARNCDF        | RangePeakinessExcludingPolarOPFD2SARNNetCDF                 | The Peakiness should be between 0 and 15000 (or missing) for surface type = ocean for latitudes between -70 and 70 degrees                   |
| RPEOPFDSINNCDF        | RangePeakinessExcludingPolarOPFD2SINNetCDF                  | The Peakiness should be between 0 and 90000 (or missing) for surface type = ocean for latitudes between -70 and 70 degrees                   |
| RPEOPLRMNCDF          | RangePeakinessExcludingPolarOPLRMNetCDF                     | The Peakiness should be between 0 and 6400 (or missing) for surface type = ocean for latitudes between -70 and 70 degrees                    |
| RPEOPSARNCDF          | RangePeakinessExcludingPolarOPSARNNetCDF                    | The Peakiness should be between 0 and 15000 (or missing) for surface type = ocean for latitudes between -70 and 70 degrees                   |
| RPEOPSINNCDF          | RangePeakinessExcludingPolarOPSINNetCDF                     | The Peakiness should be between 0 and 90000 (or missing) for surface type = ocean for latitudes between -70 and 70 degrees                   |
| RSSBONCDF             | RangeSeaStateBiasCorrectionOceanNetCDF                      | The sea state bias correction should be between -500mm and 0mm (or missing) for surface type = ocean                                         |
| RSSHAOFDNCDF          | RangeSeaSurfaceHeightAnomalyOceanFD3NetCDF                  | The sea surface height anomaly should be between -3000mm and 3000mm (or missing) for surface type = ocean                                    |
| RSSHAOFDPLRMNCDF      | RangeSeaSurfaceHeightAnomalyOceanFD3PLRMNetCDF              | The sea surface height anomaly should be between -3000mm and 3000mm (or missing) for surface type = ocean                                    |
| RSSHAONCDF            | RangeSeaSurfaceHeightAnomalyOceanNetCDF                     | The sea surface height anomaly should be between -3000mm and 3000mm (or missing) for surface type = ocean                                    |
| RSWHOEFPDNCDF         | RangeSignificantWaveHeightOceanExcludingPolarFD2NetCDF      | The significant wave height should be between 0mm and 15000mm (or missing) for surface type = ocean for latitudes between -70 and 70 degrees |
| RSWHOEFPDPLRMNCDF     | RangeSignificantWaveHeightOceanExcludingPolarFD2PLRMNetCDF  | The significant wave height should be between 0mm and 15000mm (or missing) for surface type = ocean for latitudes between -70 and 70 degrees |
| RSWHOEPCDF            | RangeSignificantWaveHeightOceanExcludingPolarNetCDF         | The significant wave height should be between 0mm and 15000mm (or missing) for surface type = ocean for latitudes between -70 and 70 degrees |
| SPHRTASCNSCDF         | SPH_Rel_Time_ASC_Node_Start_v2_NetCDF                       | Rel_Time_ASC_Node_Start mismatch (DBL ASC, rounded up to 0.1)                                                                                |
| SOOHIFHD              | SameOrOneHigher1HzIndexFor20HzData                          | The 1 Hz index of a 20 Hz sample should be the same or 1 higher than its previous sample                                                     |
| SCSTODHRNCDF          | SequenceCounterStepTODHRNetCDF                              | The sequence counter should be modulo 4 higher with regard to the previous sequence counter                                                  |
| SCSTODNCDF            | SequenceCounterStepTODNetCDF                                | The sequence counter should be one higher (modulo 16384) with regard to the previous sequence counter                                        |

### 7.3 Missing QCC Reports

Number of products with missing QCC reports: 0