



Systematic Calval SWIM - CFOSAT

CNES, CASYS

Synthesis report on parameters quality: cycle 1 (2018-11-01 - 2018-11-14)



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Main Part I

Introduction

Part 1

Context

Document overview This document reports the major features that characterize the quality of SWIM/CFOSAT data. It is released on a cyclic basis.

The main goals of the document are:

- to report any changes in software and data processing;
- to present the main instrumental parameters;
- to provide insights on data quality and coverage.

Software version This cycle was produced with:

- product version: 5.1.2;
- CDB version: 21_28;
- CASYS version: 2.5.5.

Specific events Nothing to report.

Long term monitoring Statistics are provided on a long-term prospect, starting from April 19th, 2019 (cycle 14).

Part 2

Glossary

Track, Pass refers to a half-orbit of CFOSAT.

Cycle refers to the 13-day period that takes CFOSAT to come back to the same position.

AWWAIS SWIM processing chain in the French ground segment associated with a version number.

Main Part II

Coverage

Part 3

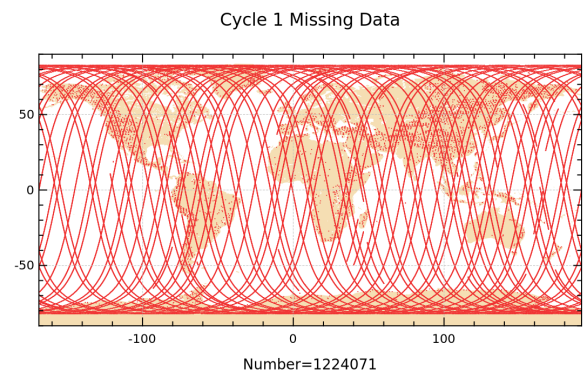
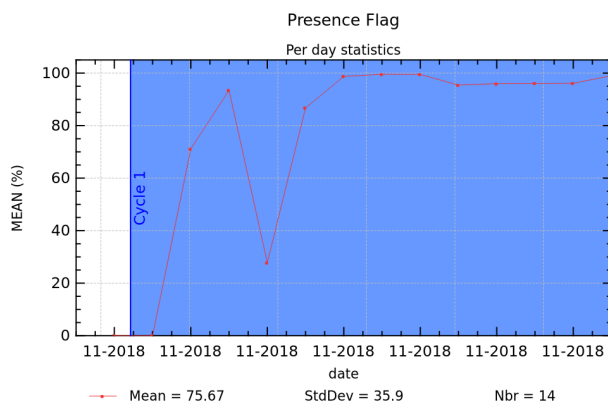
Coverage nadir 5Hz

Coverage is monitored by the presence flag, which gives the percentage of nadir points available in CFOSAT Level-2 products regardless of surface type. This information is obtained by comparing the 5Hz resolution time with the theoretical ground track.

Missing data cycle 001 No missing data.

Table 3.1: SWIM nadir 5Hz coverage

| Percentage on current cycle | Cycle 1 |
|---|---------|
| Percentage of available measurements over ocean | 81.95 % |
| Percentage of missing measurements over ocean | 18.05 % |



Main Part III

Editing

Part 4

Nadir 5Hz Nsec

The data are edited based on two types of criteria: quality (flag) and thresholds, both defined in the table below. The quality criterium is applied first. It is based on the SWH flag that is included in the Level-2 products and illustrated by the "Edited data by quality control" figure below. This flag takes into account surface (land) and sea-ice coverage at a threshold defined in the product attributes. As for the second criterium, thresholds on several variables are applied. Values outside minimal and maximal limits are rejected and are not taken into account in the statistical analyses.

Maps in this part represent data on land and ocean for the current cycle, whereas temporal monitorings are given on ocean only.

Table 4.1: Thresholds for data editing

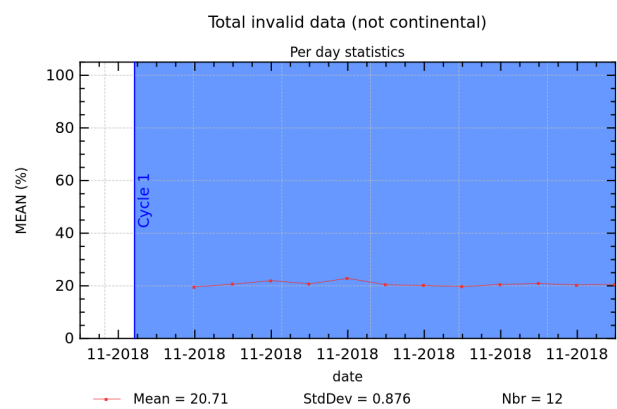
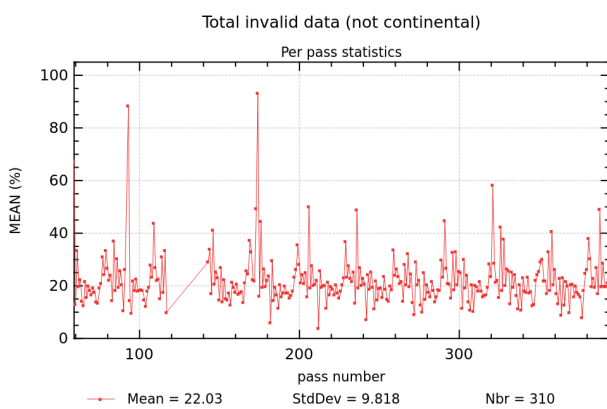
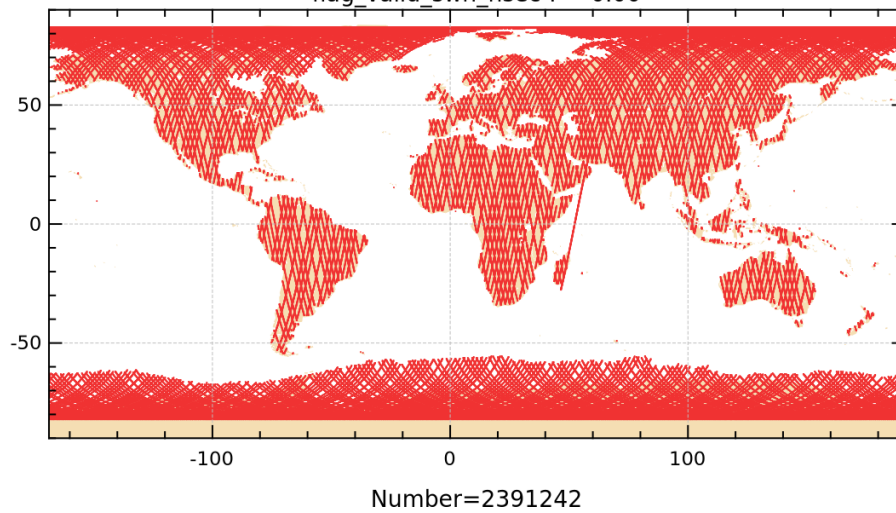
| Variables 5Hz | Min value | Max value |
|---------------------|-----------|---------------------------------|
| nadir_swh_nsec | 0 | 20 |
| nadir_swh_nsec_used | 10 | 20 |
| nadir_swh_nsec_std | 0 | $0.4 + \text{SWH.ALTI} * 0.028$ |
| wind_speed | 0 | 30 |
| nadir_sigma0 | 5 | 25 |
| nadir_sigma0_std | 0 | 3.0 |
| nadir_sigma0_used | 10 | 20 |
| flag_swh | 0 | 0 |
| ice_flag | 0 | 0 |

Table 4.2: SWIM nadir 5Hz coverage

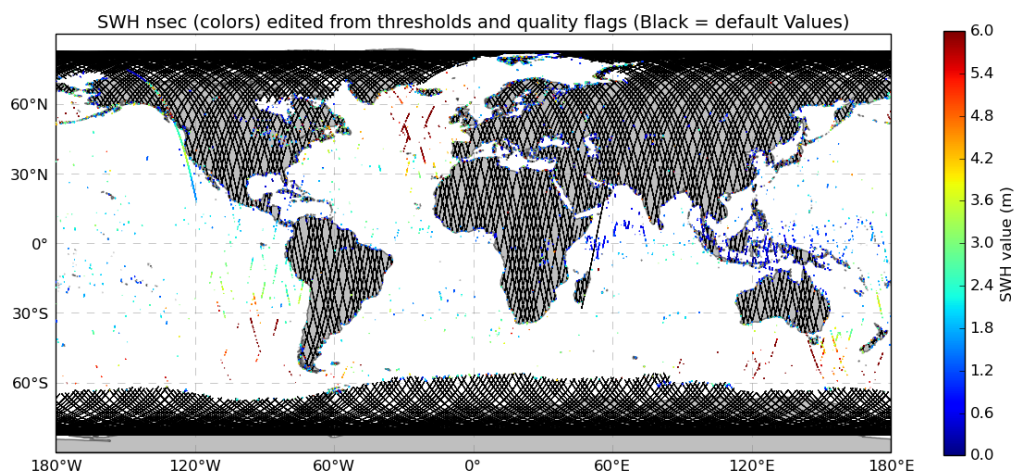
| Percentage on current cycle | Cycle 1 |
|---|---------|
| Percentage of rejected points due to quality flag swh including product ice flag over ocean | 19.04 % |
| Additionnal percentage of threshold rejection | 1.64 % |
| Total percentage of rejected measurements over ocean | 20.70 % |

Edited data by quality control

flag_valid_swh_nsec != 0.00



The figure on the left represents rejected values based on the editing criteria listed in Table 4.1. The map shows the SWH values of rejected points in colour. When this representation is not possible (masked points, non-computed values) points are represented in black.



Main Part IV

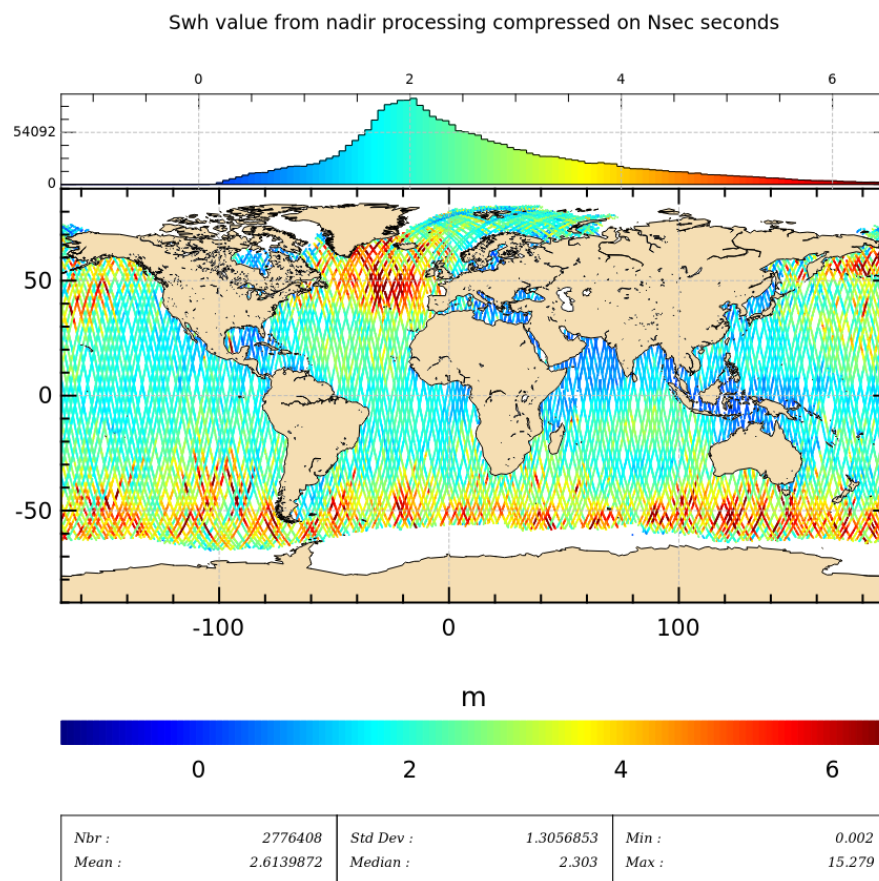
SWIM nadir monitoring

Part 5

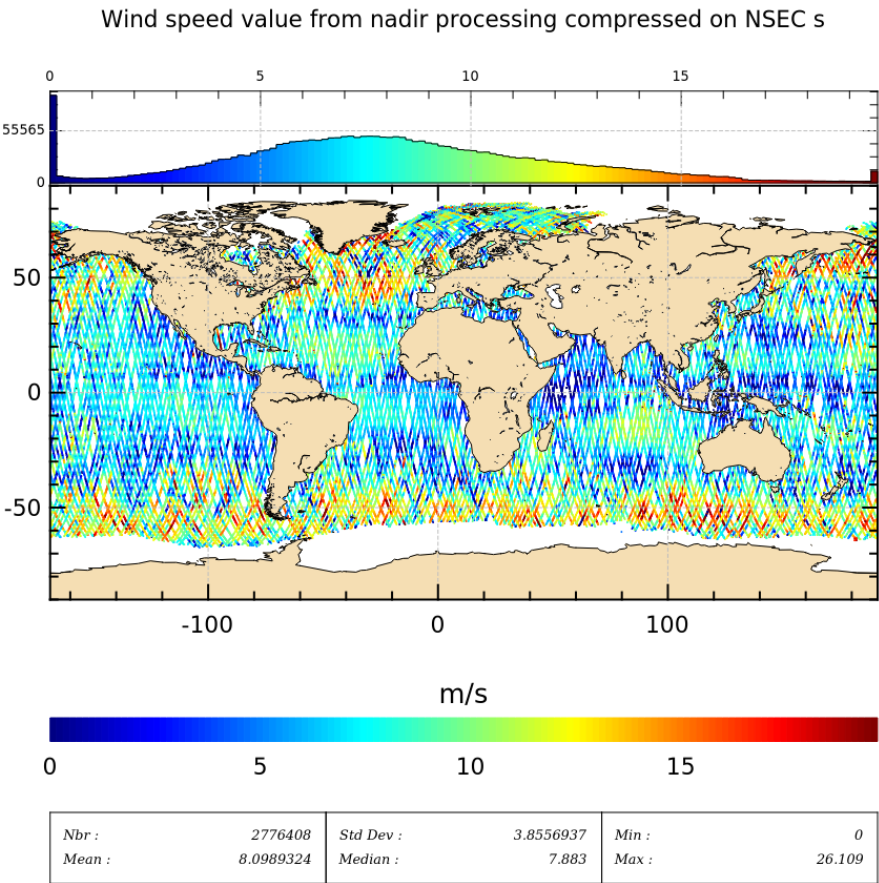
Current cycle maps of valid SWH and wind speed

5.1 Current cycle map of valid SWH

Two types of nadir waves are monitored: native SWH and Nsec SWH. The native SWH is the output of the adaptive retracking at 5Hz resolution. The Nsec SWH is the native SWH compressed with a sliding window of N seconds; here Nsec has a 5Hz resolution. In this part, only valid data are assessed, i.e. all values rejected based on the editing described previously are not taken into account.



5.2 Current cycle map of wind speed

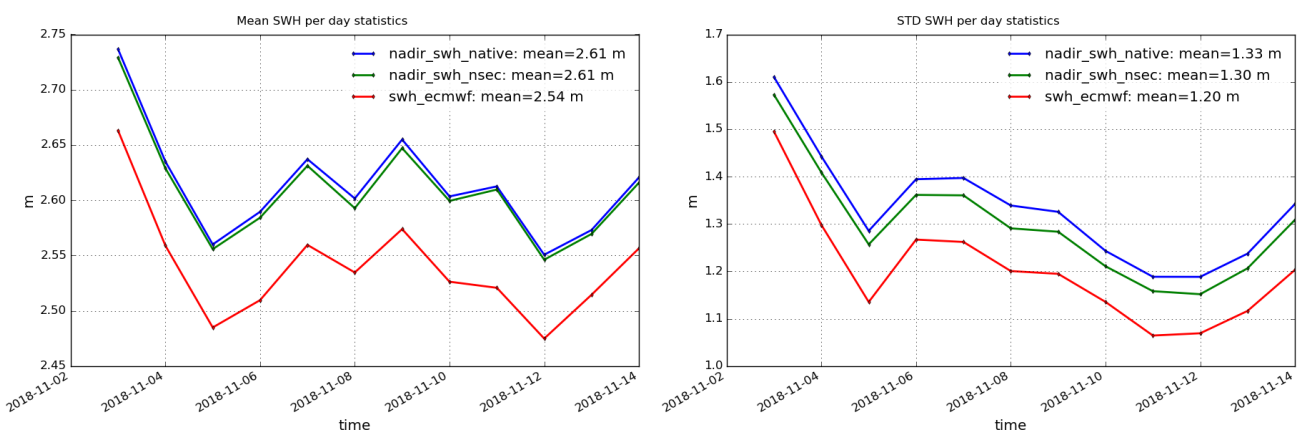


Part 6

SWIM nadir versus ECMWF model

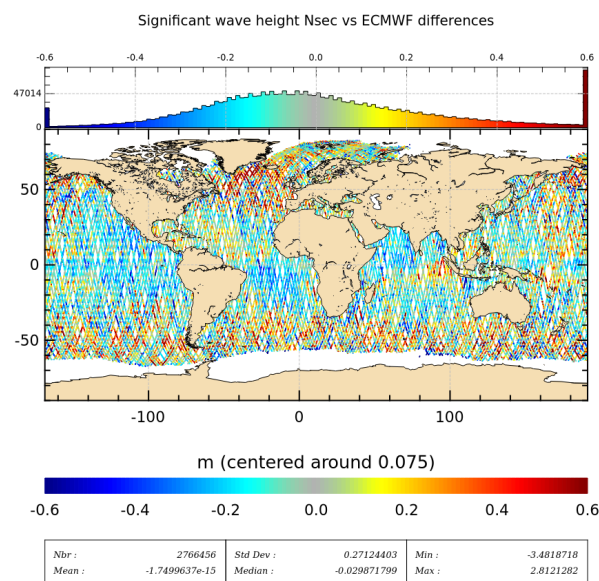
The following figures compare SWH from SWIM nadir to that of the ECMWF model. The editing criteria applied to SWIM data are equally applied to ECMWF in order to perform a direct comparison.

6.1 Long term monitoring along track for SWH



6.2 Current cycle map of SWH difference with ECMWF model

This maps represent the difference SWIM nadir - ECMWF for the current cycle.

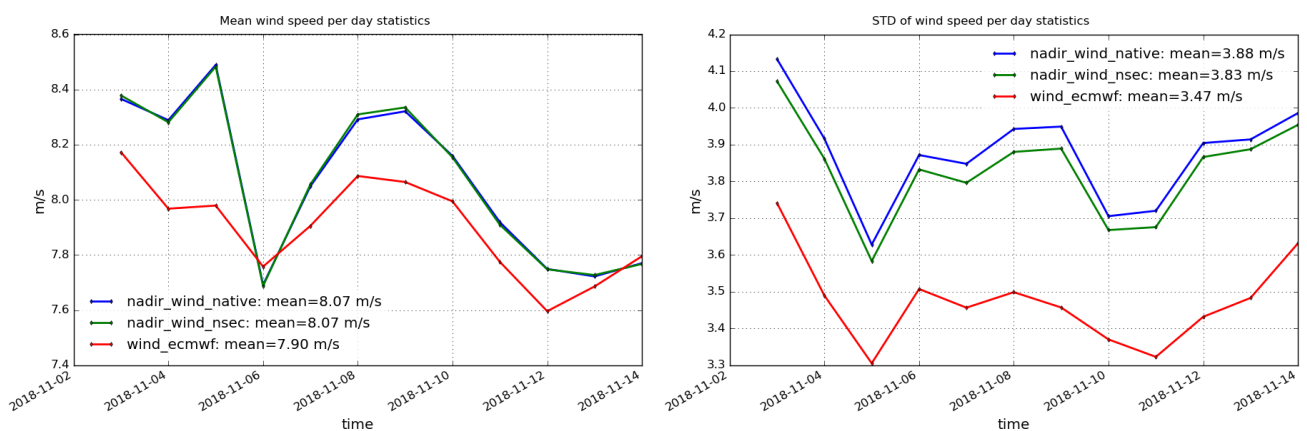


Part 7

Wind speed versus ECMWF model

The following figures compare the wind speed from SWIM nadir to that of the ECMWF model.

7.1 Long term monitoring along track for wind speed



7.2 Current cycle map of Wind speed difference with ECMWF model

This maps represent the difference Wind Nadir (Nsec) - ECMWF for the current cycle.

