

Title:

Bias in radiometric calibration of S1-B WV products acquired before 12th May 2020

Description:

A change of calibration methodology of S-1 WV products was associated to a compensation of a systematic bias on Normalised Radar Cross Section.

As a consequence, the Normalized Radar Cross Section of products processed before this date is considered biased with 0.51dB for WV1 and -0.18 dB for WV2.

Degradation types:

- | | |
|--|--|
| <input type="checkbox"/> DEGRADED_PRODUCT_RADIOMETRY | <input type="checkbox"/> DEGRADED_PRODUCT_GEOLOCATION |
| <input checked="" type="checkbox"/> DEGRADED_RADIOMETRIC_CALIBRATION | <input type="checkbox"/> DEGRADED_PLATFORM_POINTING |
| <input type="checkbox"/> DEGRADED_ORBIT_CONTROL | <input type="checkbox"/> DEGRADED_PERFORMANCE_INSTRUMENT_ANOMALY |
| <input type="checkbox"/> COMPLETE_PRODUCT_DEGRADATION | <input type="checkbox"/> SLICE_PRODUCT_NON_CONCATENABLE |
| <input type="checkbox"/> DEGRADED_PHASE | <input type="checkbox"/> OTHER |

Degradation percentage¹:

10%

Impacted products:

- | | | | | | |
|-----------------------------|---|--|---|---|-----------------------------|
| Platform: | <input type="checkbox"/> S-1A | <input checked="" type="checkbox"/> S-1B | | | |
| Acquisition mode: | <input type="checkbox"/> EW | <input type="checkbox"/> IW | <input type="checkbox"/> SM | <input checked="" type="checkbox"/> WV | <input type="checkbox"/> RF |
| Product type: | <input type="checkbox"/> RAW | <input checked="" type="checkbox"/> SLC | <input type="checkbox"/> GRD | <input checked="" type="checkbox"/> OCN | |
| Resolution class: | <input type="checkbox"/> MR | <input type="checkbox"/> HR | <input type="checkbox"/> FR | <input checked="" type="checkbox"/> N/A | |
| Polarization: | <input type="checkbox"/> SH (Single pol. H) | <input checked="" type="checkbox"/> SV (Single pol. V) | <input type="checkbox"/> DV (Double pol. V) | | |
| | <input type="checkbox"/> DH (Double pol. H) | | <input type="checkbox"/> PAC2 / DPA | | |
| Processing facility: | <input type="checkbox"/> PAC1 / UPA | <input type="checkbox"/> CGS2 / Svalbard | <input type="checkbox"/> CGS3 / Maspalomas | | |
| | <input type="checkbox"/> CGS1 / Matera | | | | |

IPF version: N/A

Instrument Configuration ID (RDB): N/A

ADF files:

<i>AUX_INS</i>	N/A
<i>AUX_CAL</i>	N/A
<i>AUX_PP1</i>	N/A
<i>AUX_PP2</i>	N/A
<i>AUX_SCS</i>	N/A

Beginning of the issue:

Start acquisition date: 2016-09-26 00:12:13 UT
 Start generation date: N/A
 Orbit: 2232
 Datatake (hex): 003C10

End of the issue:

- not yet defined available

End acquisition date: 2020-05-12 11:07:24 UT
 End generation date: 2020-05-12 13:19:31 UT
 Orbit: 21547
 Datatake (hex): 028E90

¹ Percentage of degradation of the data in the product (100% means that the product should be masked in the product catalogue)

Cause:

The radiometric calibration of S1A & B WV products is performed by geophysical validation of measured normalised radar cross section (NRCS) vs predicted NRCS from numerical weather forecast/analysis and a wind geophysical model function (GMF).

During the year 2020, the WV geophysical calibration was updated. While the Cmod-ifr2 (Quilfen, et al., 2002) was used up to now, the Cmod5n (Herbash, 2008) GMF is now used.

On the 12nd May 2020, an update of processing gain for S-1A WV and S1-B WV beams was put in place to apply the radiometric calibration derived from this new methodology and hence improve the radiometric calibration of S-1A/B WV Level 1 products.

Status:

This Quality Disclaimer reports evolution of the product performances with recalibration of the processing.

References:

- **MPC ref:** MPCs-2096, MPCs-2402

Temporal evolution of S-1B WV1 and WV2 Normalised Radar Cross section

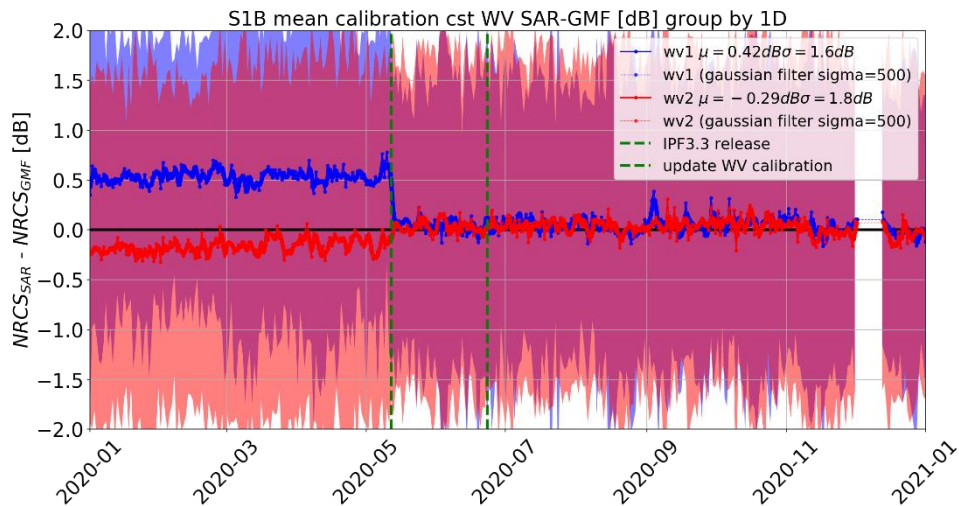


Figure 1: assessment of the WV SLC calibration (denoised Sigma0) using geophysical approach i.e. comparison with Cmod-5n with ECMWF0.125° (3h)