Title:

S-1 L2 OCN product preliminary qualified

Description:

Sentinel-1A L2 Preliminary qualification has been reached in July 2015 leading to the data access opening of WV, IW and EW OCN products.

A summary of the performance currently achieved by the L2 OCN products is available in this document annex.

Degradation types:

☐ DEGRADED_PRODUCT_RADIOMETRY   ☐ DEGRADED_PRODUCT_GEOLOCATION
☐ DEGRADED_RADIOMETRIC_CALIBRATION   ☐ DEGRADED_PLATFORM_POINTING
☐ DEGRADED_ORBIT_CONTROL   ☐ DEGRADED_PERFORMANCE_INSTRUMENT_ANOMALY
☐ COMPLETE_PRODUCT_DEGRADATION   ☐ SLICE_PRODUCT_NON_CONCATENABLE
☒ OTHER

Degradation percentage[1]:

0%

Impacted products:

Platform: ☒ S-1A   ☐ S-1B
Acquisition mode: ☒ EW   ☒ IW   ☐ SM   ☒ WV   ☐ RF
Product type: ☐ RAW   ☐ SLC   ☐ GRD   ☒ OCN
Resolution class: ☐ MR   ☐ HR   ☐ FR   ☒ N/A
Polarization: ☒ SH (Single pol. H)   ☒ SV (Single pol. V)
                         ☒ DH (Double pol. H)   ☒ DV (Double pol. V)
                         ☒ HH   ☒ HV   ☒ VV   ☒ VH
Processing facility: ☒ PAC1 / UPA   ☒ PAC2 / DPA
                         ☐ CGS1 / Matera   ☐ CGS2 / Svalbard   ☐ CGS3 / Maspalomas

IPF version: version 2.45 and later
Instrument Configuration ID (RDB): 4 and 5
ADF files:

AUX_INS	N/A
AUX_CAL	N/A
AUX_PP1	N/A
AUX_PP2	N/A
AUX_SCS	N/A

Beginning of the issue:

Start acquisition date: 2015-07-02 00:31:03 UTC
Start generation date: 2015-07-02 05:02:58 UTC
Orbit: 6624
Datatake (hex): 008D66

End of the issue:

☒   not yet defined   ☐   available

End acquisition date: N/A
End generation date: N/A
Orbit: N/A
Datatake (hex): N/A

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

Cause:

Preliminary qualification has been done and products are considered mature enough for supporting preliminary exploitation.

Status:

Operational qualification is ongoing to reach the expected performance requirements defined in S-1 Product Definition.

References:

- **MPC ref:** MPCS-963
- **PDGS ref:** N/A
- **ARTS ref:** N/A

Disclaimer for S-1 L2 OCN product preliminary qualified

1   INTRODUCTION

Sentinel-1A L2 Ocean (OCN) products are qualified in two steps:

- Preliminary qualification when the first quantitative assessment has been done and products are considered mature enough for supporting preliminary exploitation
- Operational qualification: when products have reached the expected performance requirements defined in [AD-1].

Sentinel-1A L2 Preliminary qualification has been reached in July 2015 leading to the data access opening of WV, IW and EW OCN products.

Sentinel-1 L2 OCN products provide up to three geophysical components:

- OWI: Ocean surface WInd fields
- OSW: Ocean surface SWell spectrum
- RVL: Radial VeLocities which is an experimental component

This disclaimer summarizes the performance currently achieved by the L2 OCN products.

2   DOCUMENTS

[AD-1] S-1 Product Definition, S1, RS-MDA-52-7440, issue 2.5 available on
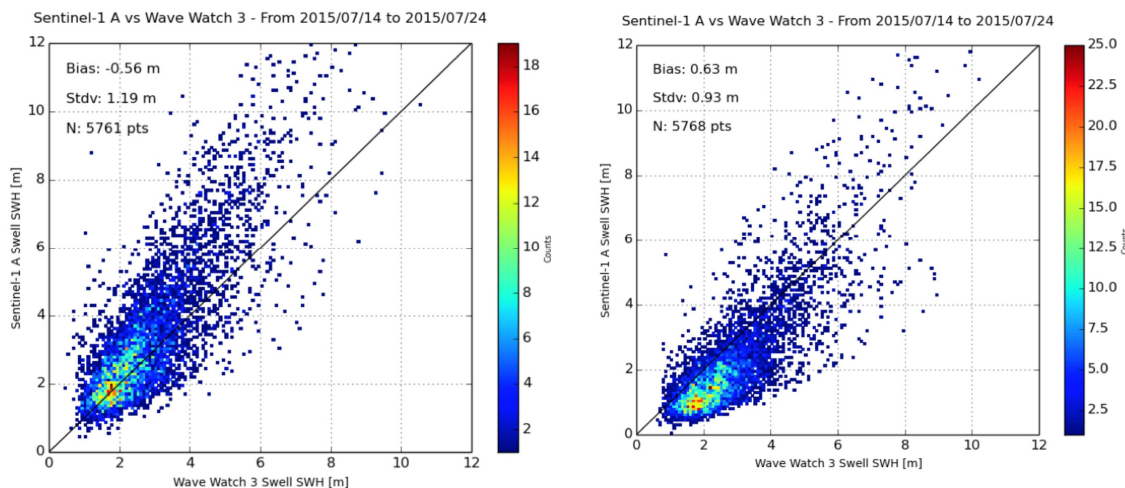https://sentinel.esa.int/web/sentinel/user-guides/sentinel-1-sar/document-library

3   WV OCN DISCLAIMER

WV OCN provides three main components: OSW, OWI and RVL

3.1 **WV OCN/OSW**

The OSW provides three main elements that present different levels of qualification as described below:

- The SAR cross-spectrum: operationally qualified
- The SAR derived swell spectrum
    - o Processing is nominal however as expected the signature of longer swell is filtered out due to the low pass filtering used to cancel non-swell related signal (e.g. rain cells). This filtering is being refined to maximise the longer swell signature and achieve the operational qualification level.
    - o SWH out of this spectrum is overestimated for WV1 and underestimated for WV2, as shown in the figure below. The MTF is being adjusted to remove the observed biases in order to achieve the operational qualification level.

Swell SWH comparison between OSW and WWV3 for WV1 (left) and WV2 (right) at VV polarisation
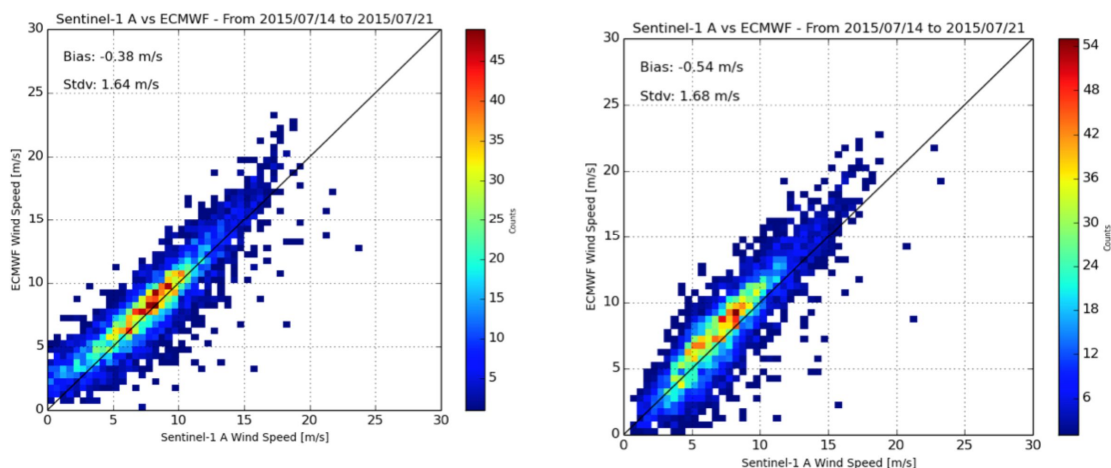
- Partitioning of the 3 most energetic partitions and associated integrated parameters.
    - o In certain conditions, the spectrum is over- or under partitioned. The partitioning scheme is being optimised in order to achieve the operational qualification level.
    - o SWH of each partition is impacted by the same under/over estimation seen in the swell spectra.
    - o Swell direction propagation presents a non-geophysical azimuth dependency with respect to the antenna look angle. This will be corrected by the MTF update

The WV OCN/OSW operational qualification is planned for October 2015.

3.2 WV OCN/OWI

The WV for OWI provides the wind direction as inverted from the wind GMF. The wind direction annotated is provided by the ECMWF wind forecast used for processing. In case no forecast is available a default 45deg direction is used.

- Processing is nominal. However a slight bias of [WV1=-0.38dB, WV2=-0.54] is observed. This will require an adjustment of the calibration constant.

Wind speed comparison between OWI and ECMWF winds for WV1 (left) and WV2 (right) at VV polarisation

The WV OCN/OWI operational qualification is planned for October 2015.

3.3 WV OCN/RVL

See specific RVL in section 5.

4 IW/EW OCN DISCLAIMER

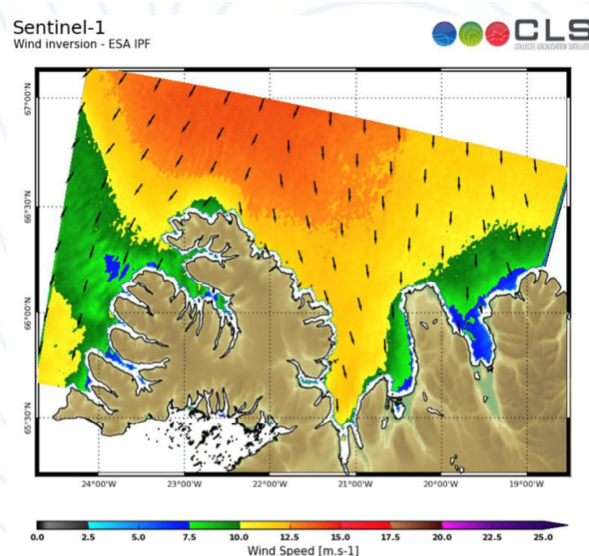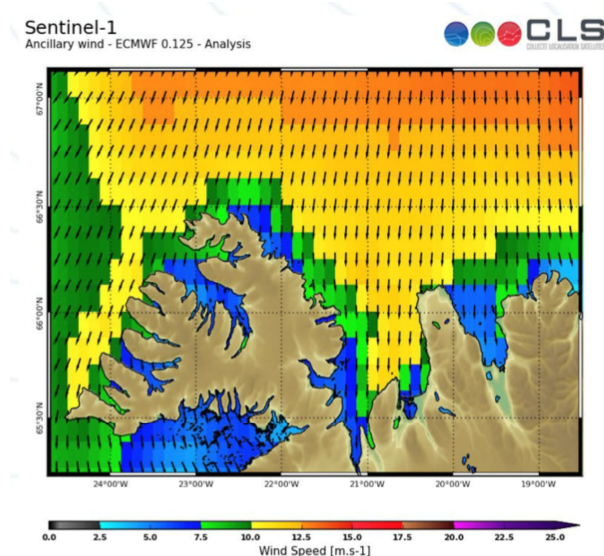TOPS OCN provides two main components: OWI and RVL

4.1 TOPS OCN/OWI

The OWI inversion scheme is nominal. The data can be used for preliminary exploitation.

The following table summarises the performances currently achieved with TOPS OWI estimation. The EW VV wind speed bias results are as expected for an operational qualification. A residual wind bias is however present for IW VV and EW HH which requires a calibration refinement in order to achieve the operational qualification level.

Mode	Polarisation	Speed Bias [m/s]	Speed RMS [m/s]	Direction Bias [deg]	Direction RMS [deg]
IW	VV	-0.41	1.49	0.15	22
	HH	Under reprocessing			
EW	VV	0.05	1.85	-5.77	33.67
	HH	-0.36	1.69	-0.39	16.34

The IW/EW OCN/OWI operational qualification is planned for October 2015.

4.2 **TOPS OCN/RVL**

See specific RVL in section 5.

5 **RVL DISCLAIMER**

The L2 OCN RVL component is an experimental component. RVL mainly relies in the Doppler anomaly defined as the difference between the Doppler centroid frequency estimated from the data and the Doppler centroid frequency estimated from the geometry.

The Doppler anomaly results obtained so far are not considered sufficiently accurate to derive reliable radial velocities, and therefore this experimental component is not considered as preliminary qualified.