S3 Product Notice – OLCI

Mission	S3A & S3B	
Sensor	OLCI	
Product	OL_1_EFR in NRT and NTC OL_1_ERR in NRT and NTC	
Product Notice ID	S3.PN-OLCI-L1.07	EUM/OPS-SEN3/DOC/19/1128998
Issue/Rev Date	29/10/2019	
Version	1.0	
Preparation	This Product Notice was prepared by the S3 Mission Performance Centre and by ESA and EUMETSAT experts	
Approval	Joint ESA-EUM Mission Management	

Summary

This Product Notice addresses both Sentinel-3A and -3B Ocean and Land Colour Imager (OLCI-A and OLCI-B) Level-1B processing baselines deployed on 29/10/2019. It is applicable to Near Real Time (NRT) and Non-Time Critical (NTC) timeliness.

The Notice describes the current Level-1B status, the processing baseline, the product quality and known limitations for both OLCI-A and OLCI-B.

The main change to the previous processing baseline is related to the improvement in OLCI-B geometric performances and the update of calibration gains and dark currents for both OLCI-A and OLCI-B.

Processing Baselines

	S3A	S3B
Processing Baseline	• Processing Baseline: 2.58	• Processing Baseline: 1.30
IPFs version	• OL_1 IPF version: 06.08	• OL_1 IPF version: 06.08
	• PUG version: 03.35	• PUG version: 03.35

Current Operational Processing Baselines

IPF	IPF / PB Version	Into operation since
S3A OL1	06.08 / 2.58	**Land Centres:** NRT mode: 29/10/2019 08:35 UTC NTC mode: 29/10/2019 08:35 UTC **Marine Centre:** NRT mode: 29/10/2019 08:35 UTC NTC mode: 29/10/2019 08:35 UTC
S3B OL1	06.08 / 1.30	**Land Centres:** NRT mode: 29/10/2019 08:35 UTC NTC mode: 29/10/2019 08:35 UTC **Marine Centre:** NRT mode: 29/10/2019 08:35 UTC NTC mode: 29/10/2019 08:35 UTC
PUG	03.35	

Status of the Processing Baselines

S3A

The current processing baseline for Sentinel-3A OLCI Level-1B products is v2.58. The baseline was deployed on 29/10/2019 at the Land and Marine Centres.

The major changes from the last processing baseline v2.55 are the following:

- Update of the Dark Correction Tables to minimize Periodic Noise impact for OLCI-A.
- Update of the Radiometric Gain Model to correct for the drift of all channels and most notably for Oa01.

The quality status of this baseline products is as follows:

Geometric Calibration

- OLCI-A geolocation accuracy meets the mission requirements in terms of global RMS value (0.5 pixel according to S3 MRTD, 2011) with a RMS performance around 0.1 pixel. Validation of the Geometric Calibration, using Landsat ground control points on current datasets (dated on 7 October 2019) shows the following geolocation accuracy per camera:

	Georeferencing Biases (pixels)	
Camera Module	**Across Track**	**Along Track**
1	0.0	-0.02
2	0.0	-0.01
3	0.0	-0.05
4	0.0	-0.05
5	0.0	0.0

The misregistration at the interfaces of each camera is below 0.1 pixels.

Spectral Calibration

- OLCI-A spectral model accuracy meets the mission requirements (S3 MRTD, 2011). The model uses in-flight data from spectral calibrations. The calibrations bring small changes to the central wavelengths compared to OLCI-A pre-launch characterizations and a more significant change to channel Oa1 (400 nm) with up to 0.4nm difference. Consistently with the solar spectrum variability, the most significant change is in in-band irradiance of channel Oa1 (up to around 1.5%) with the same impact on radiometry. OLCI-A spectral response information and datasets are provided in a separate note (S3 OLCI-A SRF, 2016).

Radiometric Calibration

- Radiometric validation results demonstrate that OLCI-A absolute radiometric calibration has a positive bias of about 2 to 3 percent throughout all bands, with the exception of band Oa21 (1020nm) at about 6 percent, OLCI being too bright. Actions are in place to achieve OLCI radiometric compliancy (2% absolute accuracy for bands ≤ 900 nm, 5% > 900 nm, S3 MRTD, 2011).
- OLCI-A Radiometric Gain Model is based on the set of in-flight radiometric calibrations ending on 28/08/2019. It includes radiometric gain coefficients at a reference date (07/12/2016) and a long-term evolution model. The set of radiometric gain coefficients used to derive both the Reference Gains and the Evolution Model have been computed using up-to-date geometric and spectral calibration, instrument settings, an upgraded diffuser BRDF model based on in-flight data, and diffuser ageing (browning) correction. The Radiometric Model is continuously monitored against new Radiometric Calibration acquisitions.

S3B

The current processing baseline for Sentinel-3B OLCI Level-1B products is v1.30. The baseline was deployed on 29/10/2019 at the Land and Marine Centres and is used in OLCI-B full mission reprocessing.

The major change from the last processing baseline v1.27 is the following:

- Update of the Geometric Calibration Models (alignment between instrument and S3-B platform) to improve georeferencing accuracy.
- Update of the Dark Correction Tables to minimize Periodic Noise impact for OLCI-B.
- Update of the Radiometric Gain Model to correct for the drift of all channels and most notably for Oa01.

The quality status of this baseline products is as follows:

Geometric calibration

- OLCI-B geolocation accuracy meets the mission requirements in terms of global RMS value (0.5 pixel according to S3 MRTD, 2011) with a RMS performance around 0.1 pixel. Validation of the updated Geometric Calibration, using Landsat ground control points on reprocessed data between 3 August 2019 and 4 October 2019 shows the following geolocation accuracy per camera:

	Georeferencing Biases (pixels)	
Camera Module	**Across Track**	**Along Track**
1	0.0	-0.1
2	0.01	-0.05
3	0.0	-0.01
4	0.0	-0.01
5	0.0	-0.02

The misregistration at the interfaces of each camera is below 0.1 pixel, except between camera 1 and camera 2 where the across-track offset reaches 0.2 pixels.

Spectral calibration information

- The OLCI-B spectral model is based on the pre-launch spectral characterisation. Spectral calibration acquisitions carried out so far have shown a very close agreement to the pre-launch characterization with small changes to the central wavelengths of max. 0.25 nm. Moreover, the calibrations show an excellent consistency across the spectral range and also with time. OLCI spectral response information and datasets are provided in a separate note (S3 OLCI-B SRF, 2018).

Radiometric calibration information

- Radiometric validation results demonstrate that OLCI-B provides measurements within the mission requirements of < 2% for the spectral range ≤ 900nm (S3 MRTD, 2011). OLCI-B radiometry is comparable to MERIS and by about 1-2% lower than OLCI-A (OLCI-A has a bright bias). Similarly to OLCI-A the 1020nm band is subject to a bright bias of about 4%.
- OLCI-B Radiometric Gain Model is based on the set of in-flight radiometric calibrations ending on 02/10/2019. It includes radiometric gain coefficients at a reference date (18/06/2018) and a long-term evolution model. The set of radiometric gain coefficients used to derive both the Reference Gains and the Evolution Model has been computed using up-to-date geometric and spectral calibration, instrument settings and the upgraded diffuser BRDF model based on in-flight data. Correction for diffuser ageing (browning) is now included. The Radiometric Model is continuously monitored against new Radiometric Calibration acquisitions.

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Known product quality limitations

Common to S3A and S3B

Radiometric Calibration

- Vertical striping at the first 100 pixels at camera interfaces can be observed in bands O19 and O20. The effect is known as periodic noise. A correction for this noise is under investigation.
- Single anomalous pixels, in particular in the region of the South Atlantic Anomaly, may occur due to prompt particle events.

Straylight

- Verification of the OLCI straylight correction performance is ongoing.

Flags

- Accuracy of OLCI L1B product flags is under assessment. No issue has been identified so far.

Per-pixel uncertainty estimates

- Uncertainty estimates for OLCI radiances for all bands are not yet available in the products.

S3A

- Nothing specific to S3A

S3B

- Nothing specific to S3B

Products Availability

☒ Copernicus Open Access Hub (https://scihub.copernicus.eu/), NRT and NTC

☒ Copernicus Online Data Access (CODA) (https://coda.eumetsat.int/), NRT and NTC

☒ EUMETCast (https://eoportal.eumetsat.int/), NRT

☒ EUMETSAT Data Centre (https://eoportal.eumetsat.int/), NRT and NTC, from 29 Oct 2019 onwards

Product	EUMETCast	ODA*	CODA	EUMETSAT Data Centre
L1 RR	NRT	NRT, NTC	NRT, NTC	NRT, NTC
L1 FR	NRT	NRT, NTC	NRT, NTC	NRT, NTC

*** ODA** is available only for Copernicus Services and S3VT users

Any other useful information

- For further details on OLCI L1B status and validation results, refer to S3 OLCI Cyclic Quality Reports available from https://sentinels.copernicus.eu/web/sentinel/technical-guides/sentinel-3-olci/data-quality-reports.

User Support

- Questions about OLCI products can be asked to the Sentinel-3 User Support desk at:
  - eosupport@copernicus.esa.int
  - ops@eumetsat.int

References

- Sentinel-3 Mission Requirements Traceability Document (MRTD), C. Donlon, EOP-SM/2184/CD-cd, 2011, https://sentinel.esa.int/documents/247904/1848151/Sentinel-3-Mission-Requirements-Traceability
- Sentinel-3 OLCI-A and OLCI-B spectral response functions (SRF), Sentinel 3 CalVal Team, S3-TN-ESA-OL-660, 2016

  https://earth.esa.int/web/sentinel/technical-guides/sentinel-3-olci/olci-instrument/spectral-response-function-data
- Product Data Format Specification – OLCI Level 1 Instrument Products, Ref: S3IPF.PDS.004.1, Issue: 2.2, Date: 09/10/2017
  - https://sentinel.esa.int/web/sentinel/user-guides/sentinel-3-olci/document-library
  - https://www.eumetsat.int/website/home/Data/TechnicalDocuments/index.html
- S3 OLCI Cyclic Quality Reports, Ref. S3MPC.ACR.PR, issued monthly, https://sentinels.copernicus.eu/web/sentinel/technical-guides/sentinel-3-olci/data-quality-reports

Static ADFs updated

S3A
▪ S3A_OL_1_CAL_AX_20190927T171839_20991231T235959_20191009T120000_____MPC_O_AL_022.SEN3
S3B
▪ S3B_OL_1_CAL_AX_20191007T204320_20991231T235959_20191009T120000_____MPC_O_AL_008.SEN3

End of the Product Notice