S-3B OLCI Status

Steffen Dransfeld, ESA ESRIN
ESA S3 Optical Data Quality Manager

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S3-B OLCI Data Release

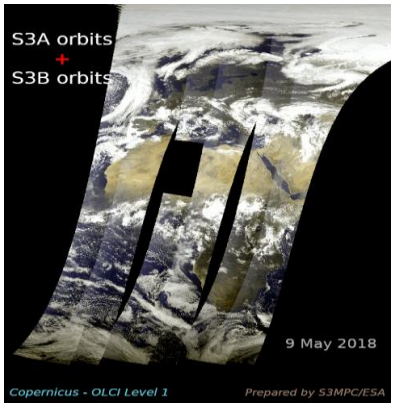
- OLCI-B L1B public release was done on the 12/12/2018 with processing baseline 1.14. L2 Land products have been released 28/01/2019
  - Geolocation for OLCI-B is within requirements in both ALT and ACT for all cameras. A negative drift is present ALT and this is still being monitored as it is about 0.1 pix/month for camera 1, 2 & 5 but monitoring shows that this drift seems to be slowing down.
  - The OLCI-B spectral model is based on the pre-launch spectral characterisation and spectral calibration acquisitions show a very close agreement 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-B radiometry is comparable to MERIS and by about 1% to 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%. These early results show an excellent performance but full radiometric assessment is however continuing.

Sentinel-3B mission status and Tandem Phase

- LEOP and SIOV finished without any anomalies
- IOCR Commissioning Mid-Term Review (MTR) took place 17 October 2018

Tandem Phase:

During drift to Tandem Position nominal 140 deg separation between S3-A and -B was passed on 9 May 2018 with the resulting coverage:



Sentinel-3A and -B tandem acquired on 6 June 2018

Sentinel-3B flew ahead of S-3A with 30 s separation, corresponding to 210 km

Tandem phase finished mid-october -> dedicated ESA project S3TC for analysis of data

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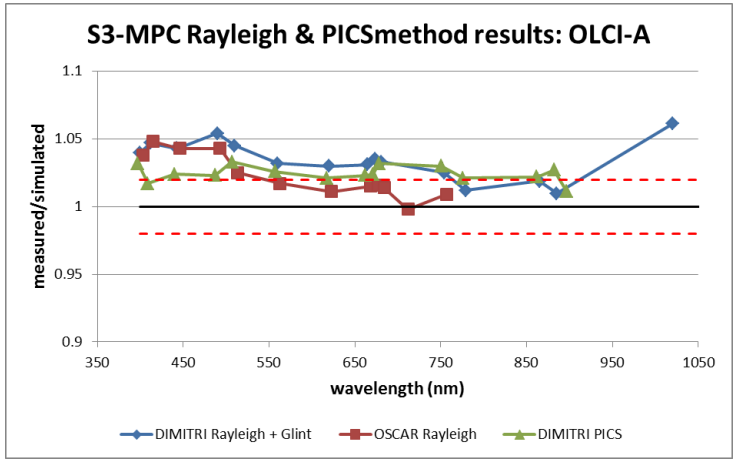
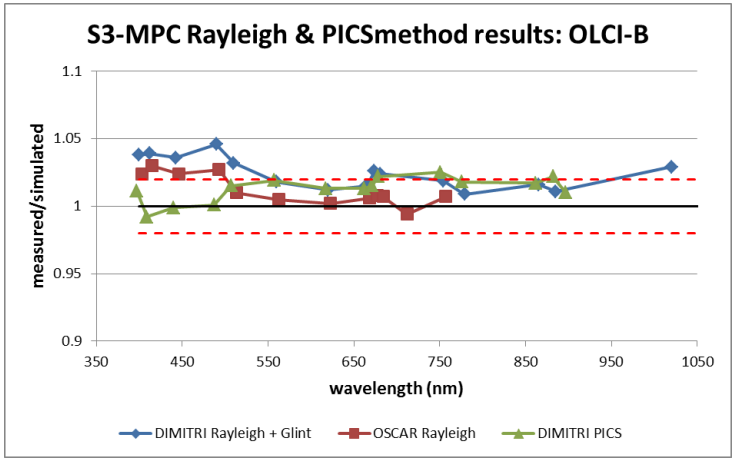
OLCI-B (vs A) Radiometry





Rayleigh, Glint and PICS assessment. For A 2-3% bias in 560-900nm except for 709 likely due to H20 absorption correction accuracy. For B similar shape but only about 1-2% bias. In blue the bias is slightly higher but Rayleigh also tends to overestimate the bias.

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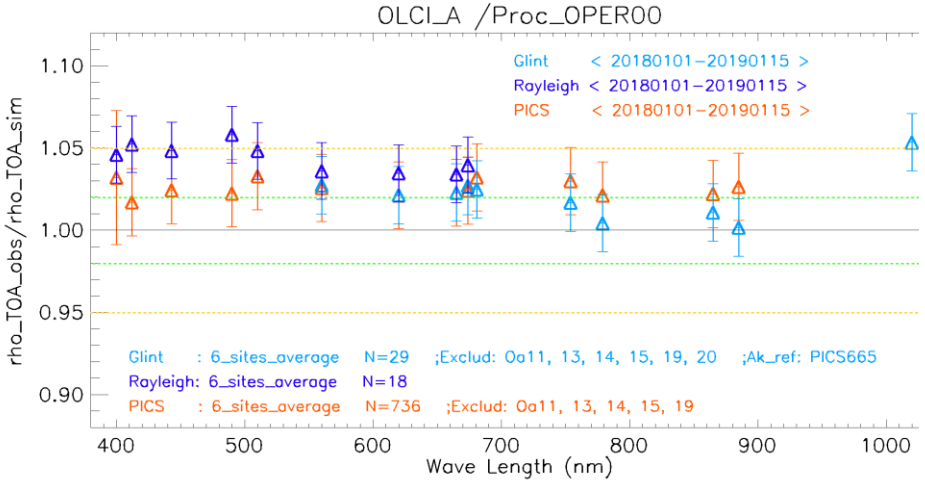
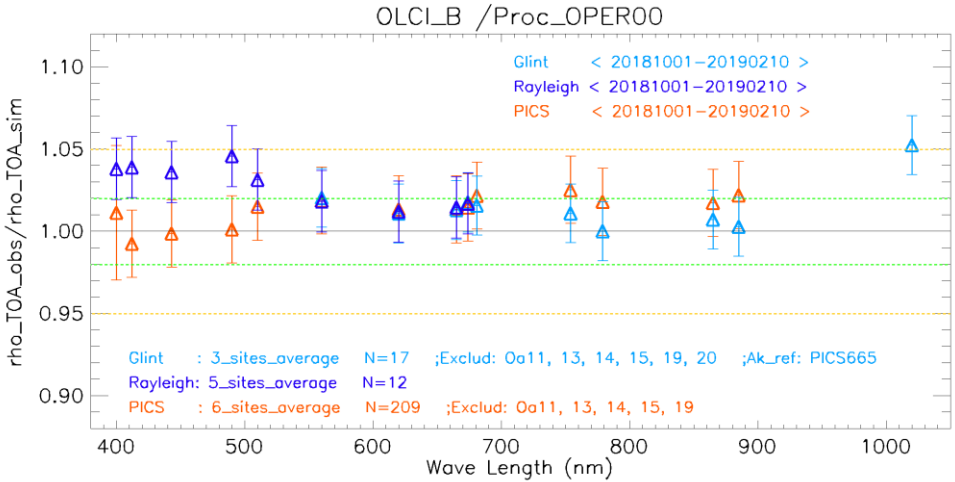
OLCI Radiometry Validation (S3MPC)

- **The ratio of observed/reference TOA reflectance**





Gain value of Oa8 665nm from PICS method as reference gain for Sunglint method. Dashed-green and orange lines indicate the 2% and 5% respectively

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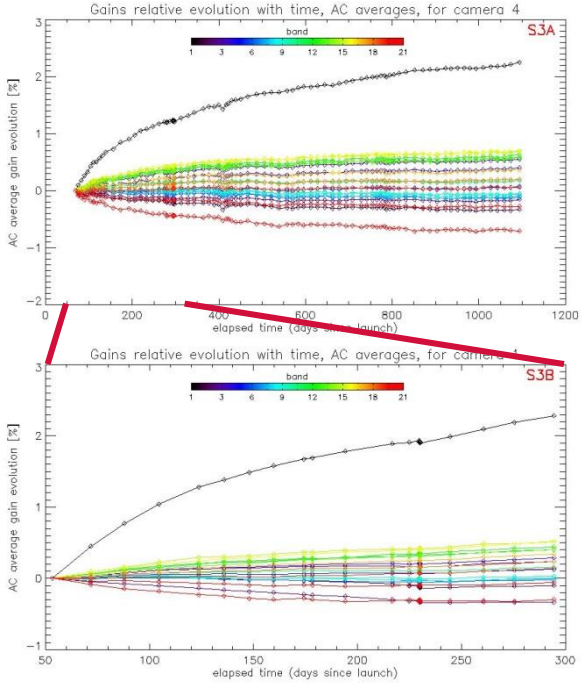
OLCI Radiometric Calibration

- Based on well characterized on-board diffuser(s)
- Diffusers BRDF re-characterized in-flight during Yaw Manoeuvres
- **Radiometric evolution assessed** from radiometric calibration after OLCI-B MTR in June **and modelled**, corrected for during EO data processing
    - OLCI-A model introduced
    - OLCI-B model under validation (delivery foreseen end of March)

OLCI-A and OLCI-B radiometric evolution so far, most varying cameras



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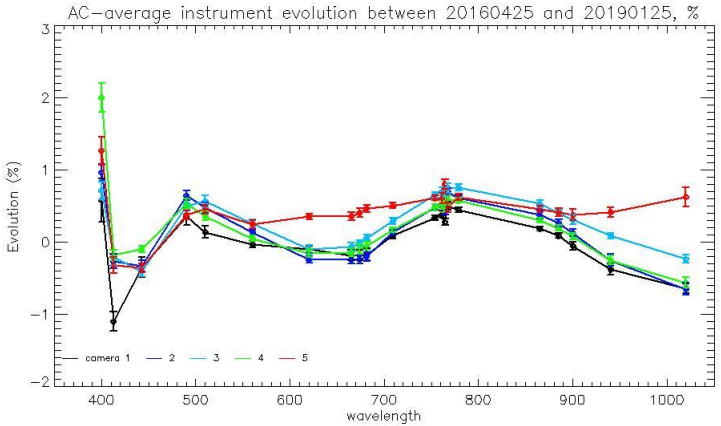
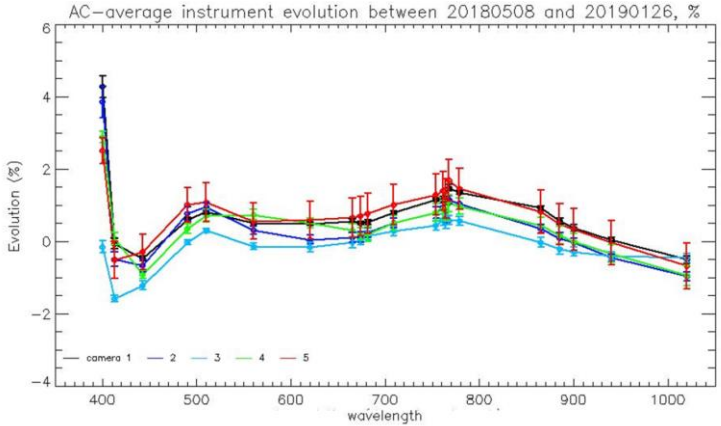
Gain evolution on OLCI-A and B and next changes for L1 radiometry

OLCI-A



OLCI-B



- OLCI-A and OLCI-B show similar evolution as OLCI-B reference for this plot is 8th of May. CF with previous slide
- OLCI-A radiometric gain model to be updated soon
- OLCI-B BRDF in-flight diffuser model based on yaw steering campaign

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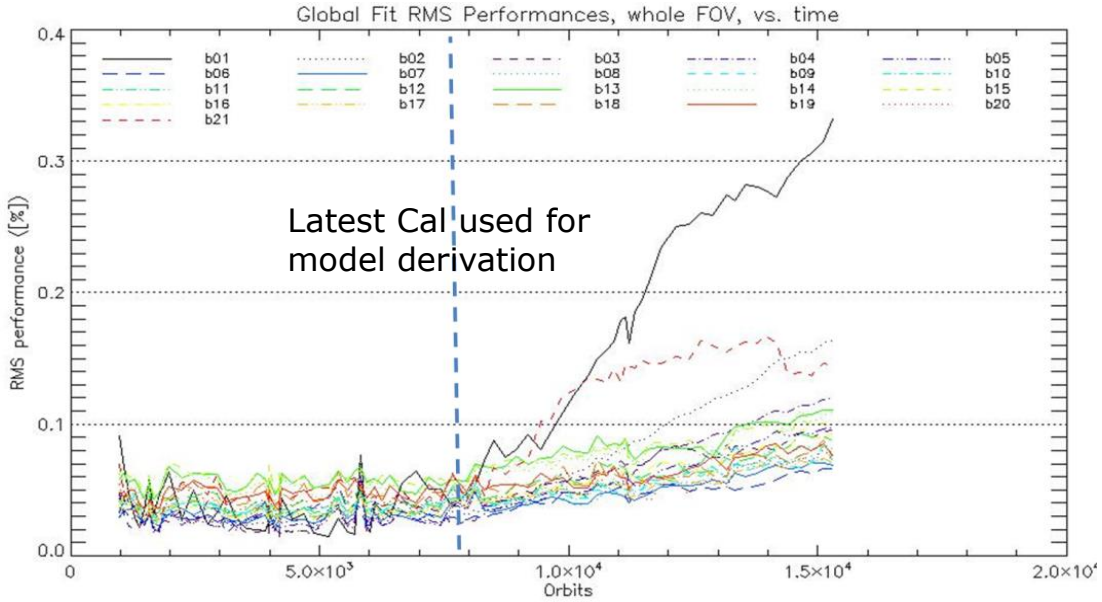
OLCI-A Gain evolution model



Model divergence is still quite low but we are revising it for the routine EO processing to bring it back to within 0.1 rms.

We expect a similar performance for modelling OLCI-B gains after implementation of the BRDF in-flight model.

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OLCI Straylight Status

OLCI-B straylight correction performance has been evaluated thanks to the Moon observation.

- Straylight correction is efficient if not perfect
- Overcorrection along the bright/dark transitions but these are mostly the 'requirement-exclusion' zone (typically 10 Pixels from coastline). Outside of these the requirements are mostly met.
- Investigations ongoing to improve the algorithm

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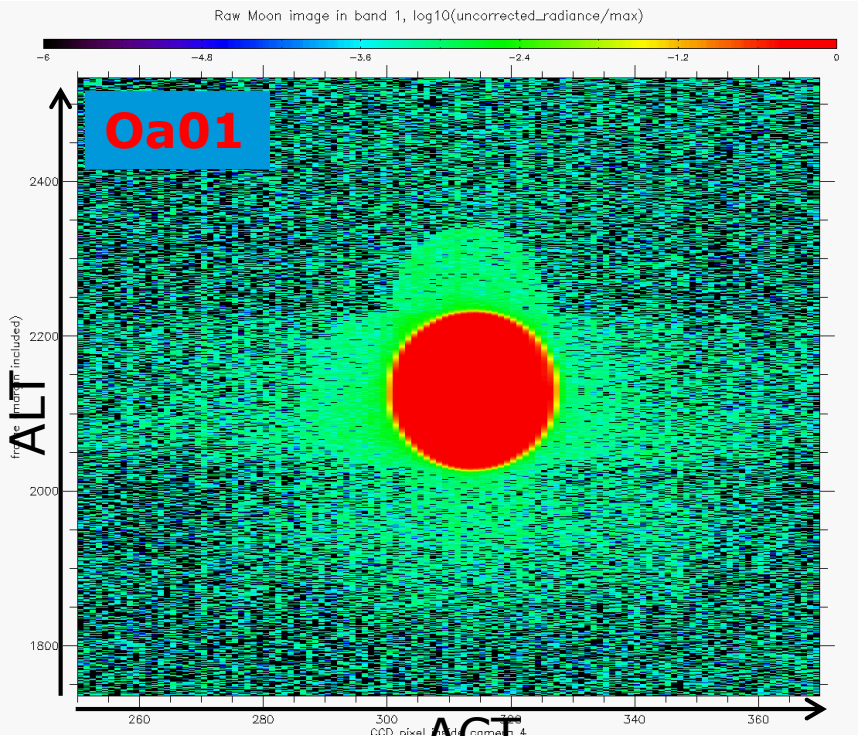
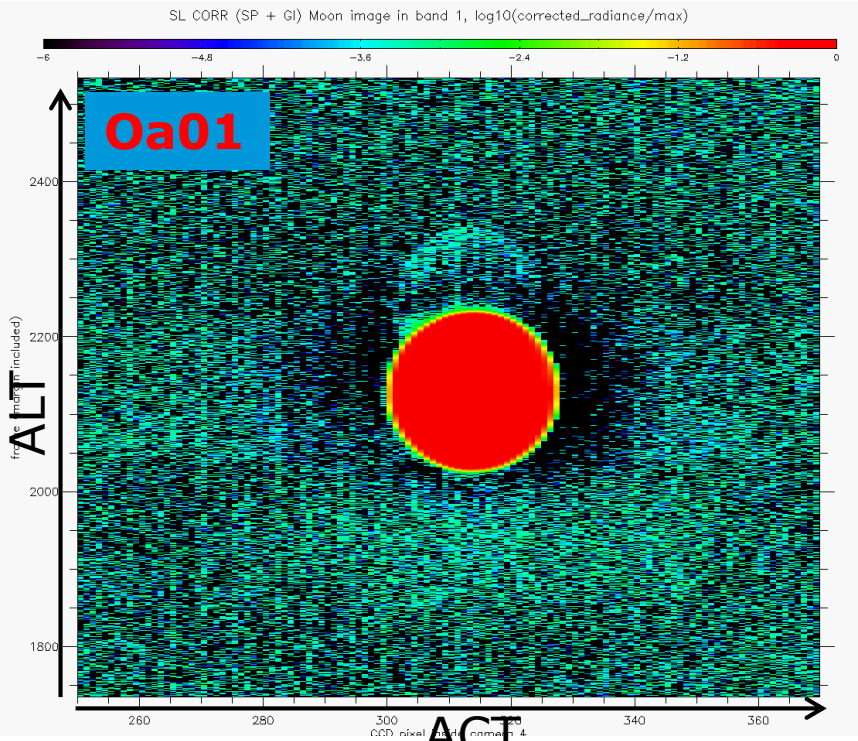
OLCI Straylight Status

Correction examples: Moon radiance (log-scale) before and after correction Oa1 400nm





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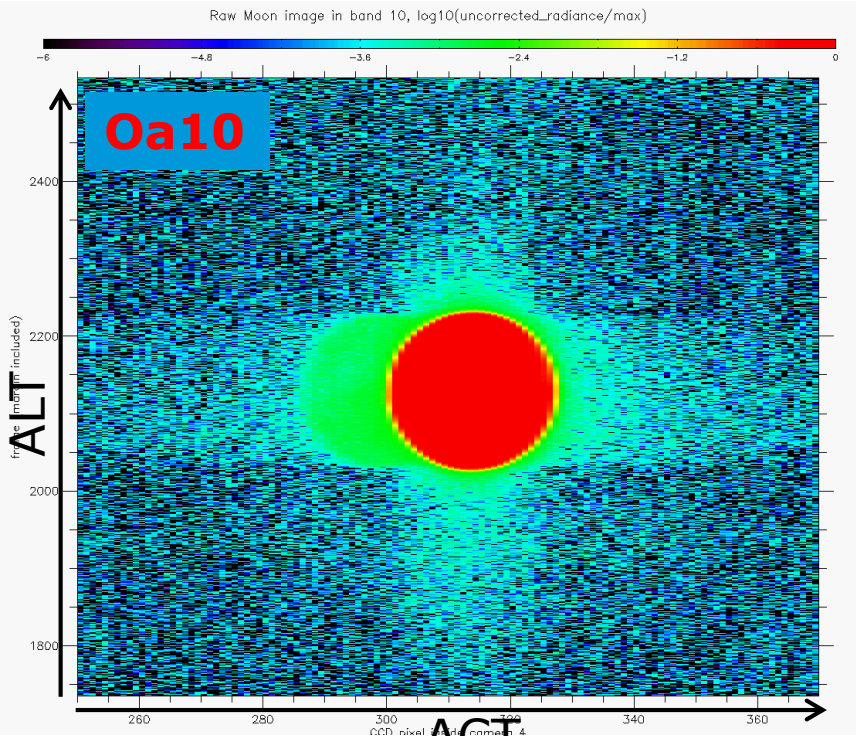
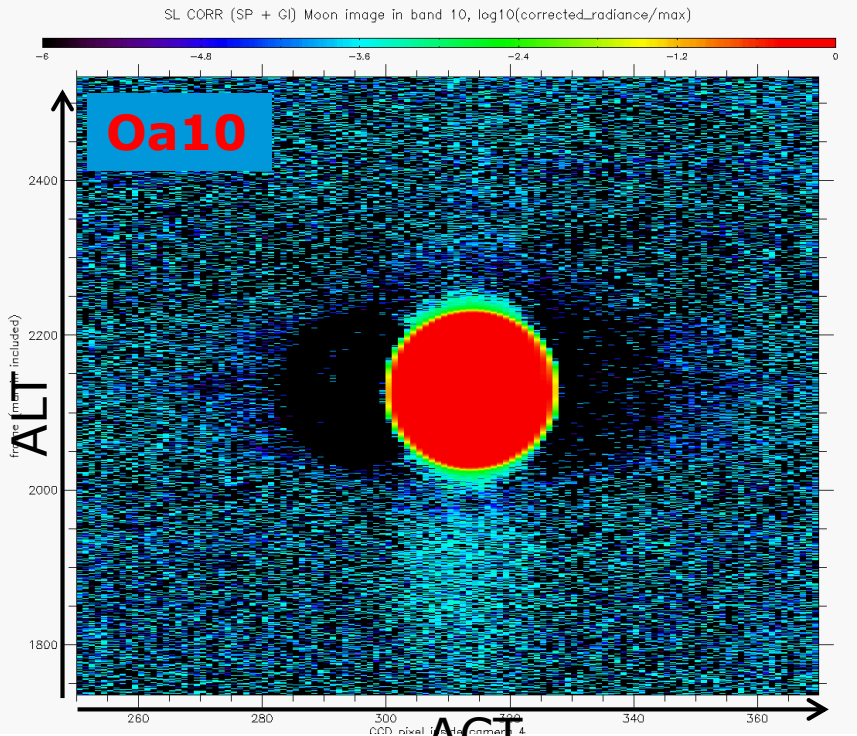
OLCI Straylight Status

Correction examples: Moon radiance (log-scale) before and after correction Oa10 681.25 nm





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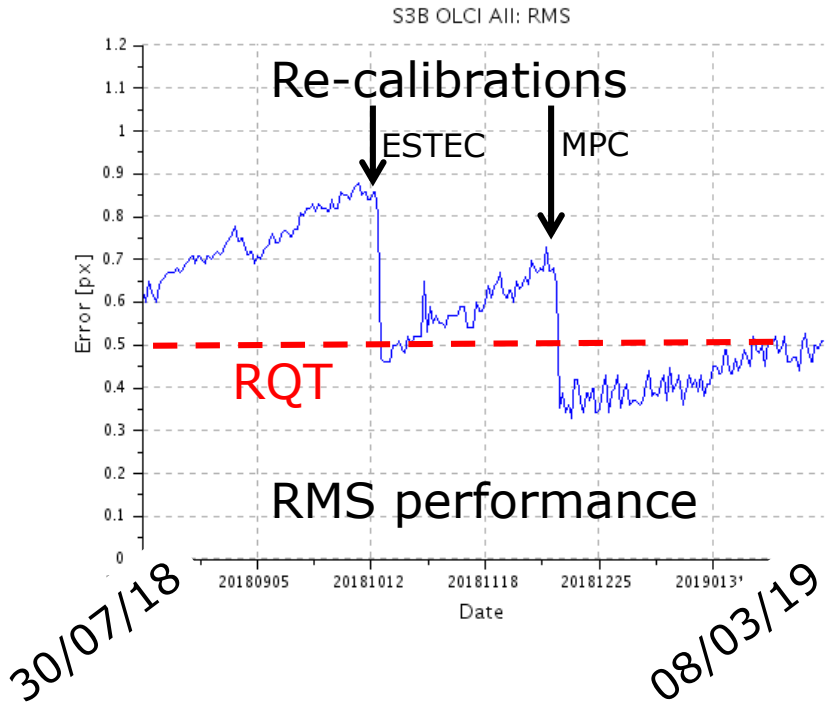
Geometric Calibration Performance OLCI (S3 MPC)



- Regular monitoring by the S3 MPC reveals continuous drift of OLCI-B Geometric Calibration.
- Compliant performance can be achieved only with frequent recalibrations.
- A new one is available and under validation.

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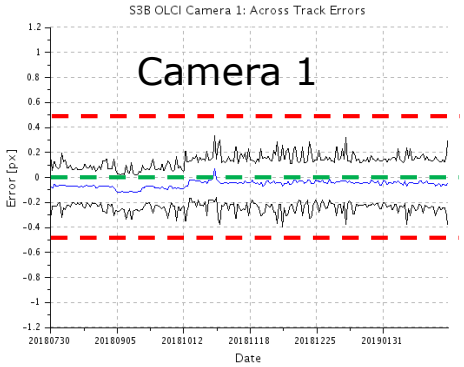
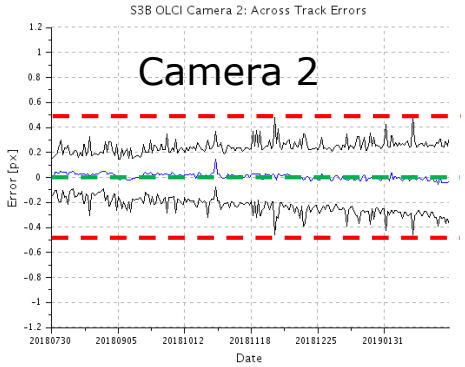
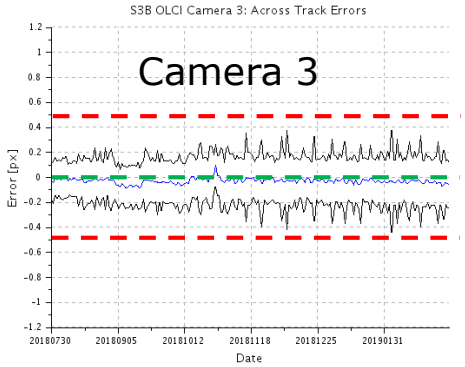
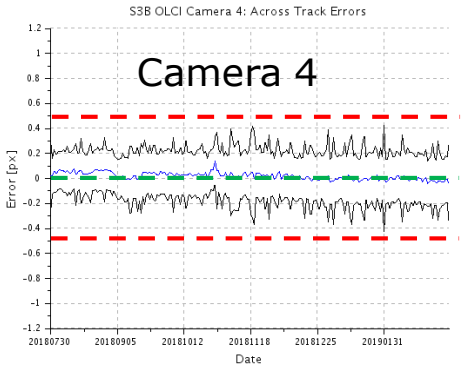
Geometric Calibration Performance OLCI-B (S3 MPC)

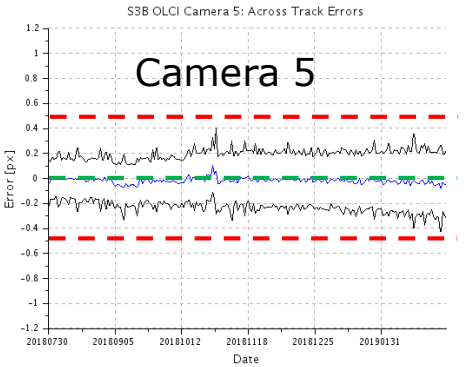
Across-track biases











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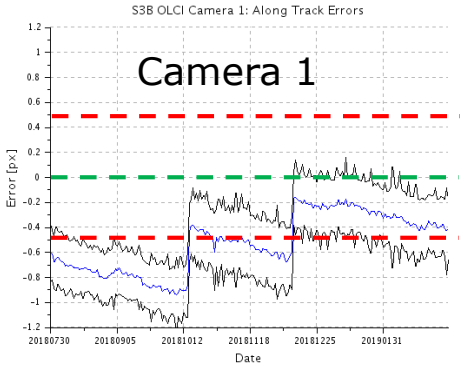
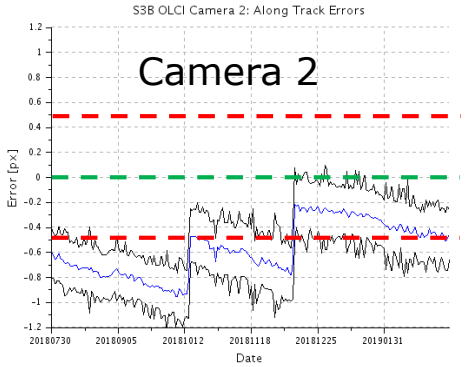
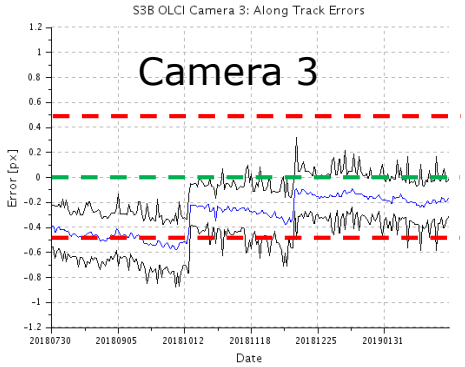
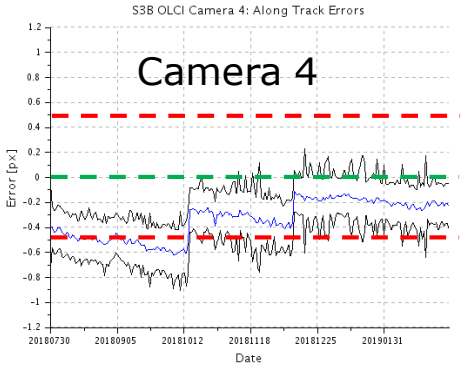
Geometric Calibration Performance OLCI-B (S3 MPC)

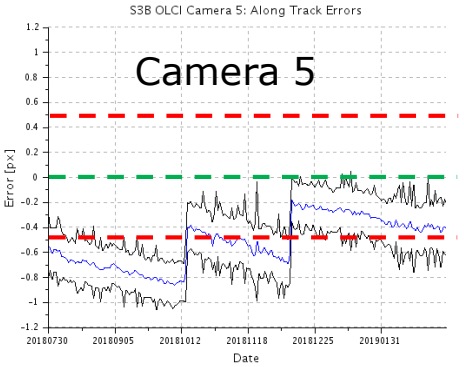
Along-track biases











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iCOR4S3 Implementation and Validation

As a response to the user community request to provide an independent method for a different atmospheric correction than MAR L2 OPE products, ESA funded a study with VITO to implement the iCOR atmospheric correction as a SNAP Plug-in.

- iCOR has also been implemented as a SNAP plug-in for S2 and Landsat 8 providing consistent atmospheric correction

- iCOR includes the adjacency correction SIMEC which improves the AC especially over inland waters

- iCOR4S3 has been implemented end of 2018 and validation using ground-based measurements shows a consistent improvement to the operational products

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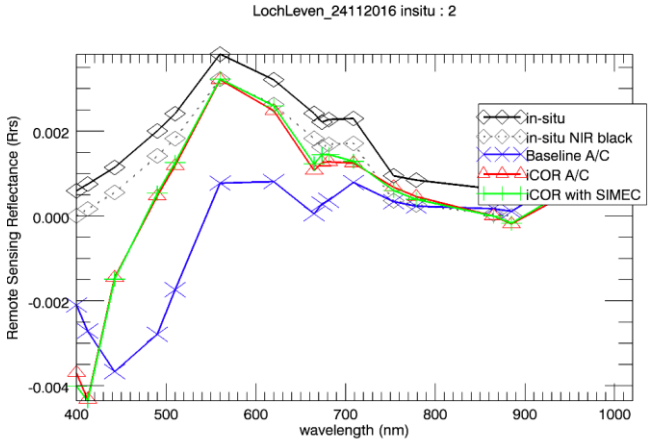
iCOR4S3 – SNAP Plug-in

Different Validation Sites

Site	Surrounding lanscape
Lake Marken	Mostly cultivated areas and some artificial surfaces
Curonian Lagoon	Mostly cultivated areas and water
Lake Garda	Cultivated in the South, tree cover in the North
Lake Balaton	Cultivated area and tree cover
Lake Peipsi	Tree cover. Some cultivation on the West part of the lake
Loch Lomond	Shrub and herbaceous cover
Loch Leven	Cultivated and herbaceous cover
Roodeplaat Dam	Artificial areas, mosaic vegetation/croplands and closed to open shrubland



Loch Leven Validation

Baseline A/C (MAR L2) consistently underestimates reflectances in the blue/green and iCOR approaches in situ spectra. Access to full validation report can be given. Validation using Radcalnet surface data has also started.

iCOR4S3 can be accessed from
https://blog.vito.be/remotesensing/icor-for-sentinel-3

Thank you,

Questions ?

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