



PROGRAMME OF
THE EUROPEAN UNION



PRODUCT PERFORMANCE STATUS (L1)

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CEOS-IVOS Meeting 25-29th 2023, DLR, Oberpfaffenhofen

OLCI-A/B L1 PLANNED UPDATES AND ACTIVITIES

L1 reprocessing (R 6.11 and A 8.15, 8.16)

the reprocessing to start in summer 2023 (EUM activity)

Cooperation ESA-EUM on the development of the reprocessing L1 IPF PB (ESA activity) ongoing.

Potential future updates:

High Energy Particle flagging in EO data (OLCI/SYN QWG A7.13, R7.3), 2024

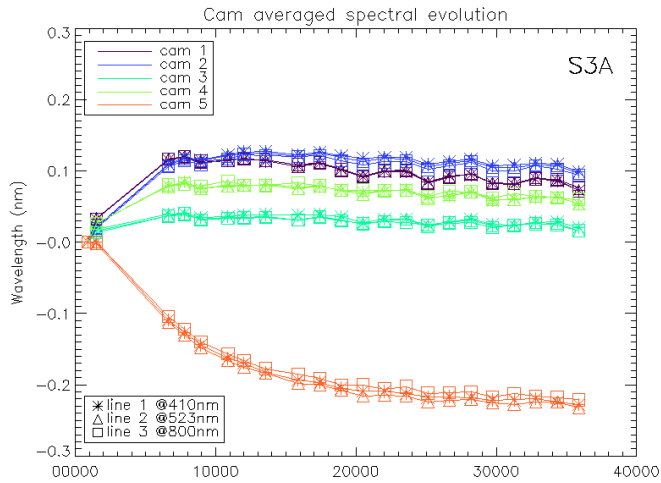
Straylight correction improvements, 2025 or later

Reprocessing IPF PB will include

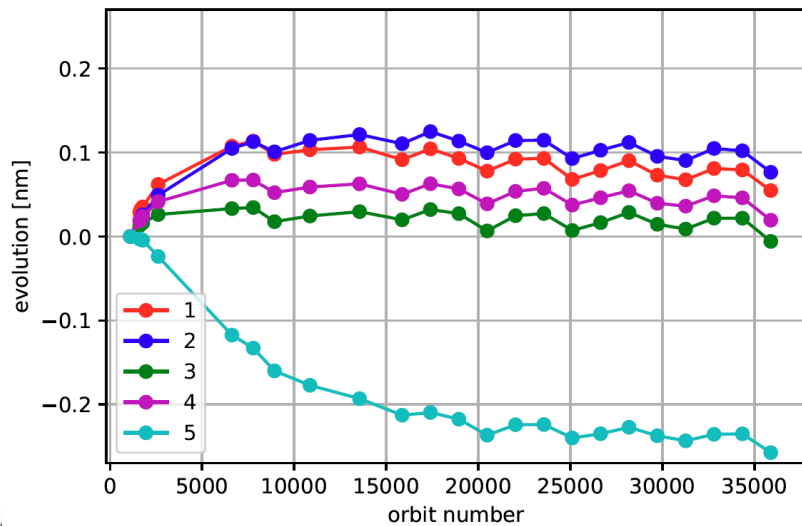
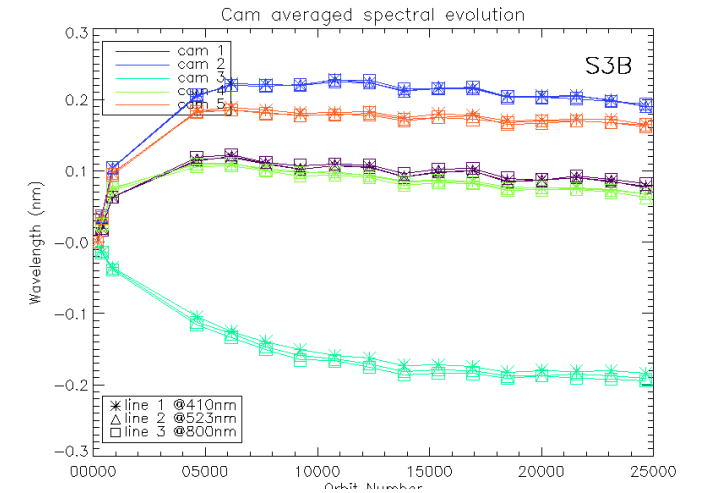
Reprocessing L1 IPF PB updates	Status	Impact on L1 IPF operations
Radiometric calibration – consistent calibration across the A+B missions	To be developed. Consider residual calibration limitations showing as trends in oligotrophic waters in red and NIR.	None But update of cal-ADF may be needed
OLCI-A time series start 6 April 2016	To be developed. Consider the instrument gain change 26/04/2016.	None
Uncertainties products	Available	EUM switch-ON L1 uncertainties in OPE (system impact)
Spectral temporal model	Spectral temporal model exists but needs to be updated and implemented in the IPF.	IPF minor update
New solar spectrum	Switch to TSIS as per CEOS/GSICS recommendation	IPF minor update



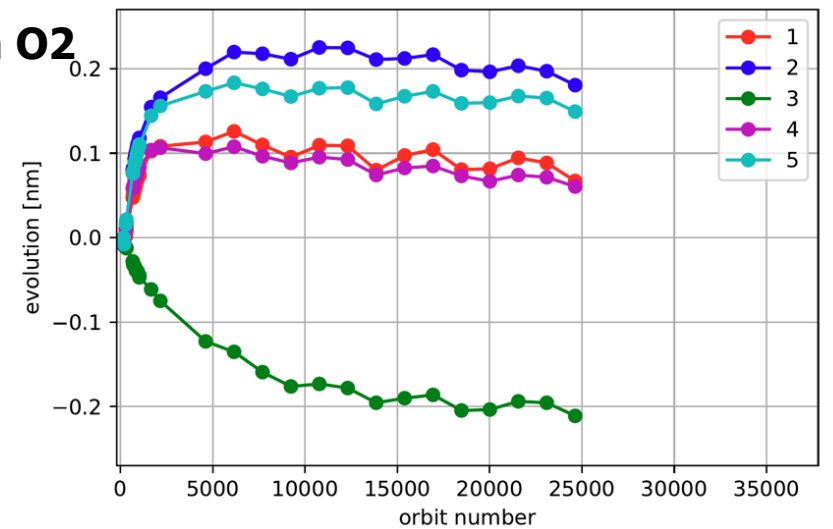
OLCI SPECTRAL CALIBRATION THROUGHOUT MISSION AND AVERAGED PER CAMERA



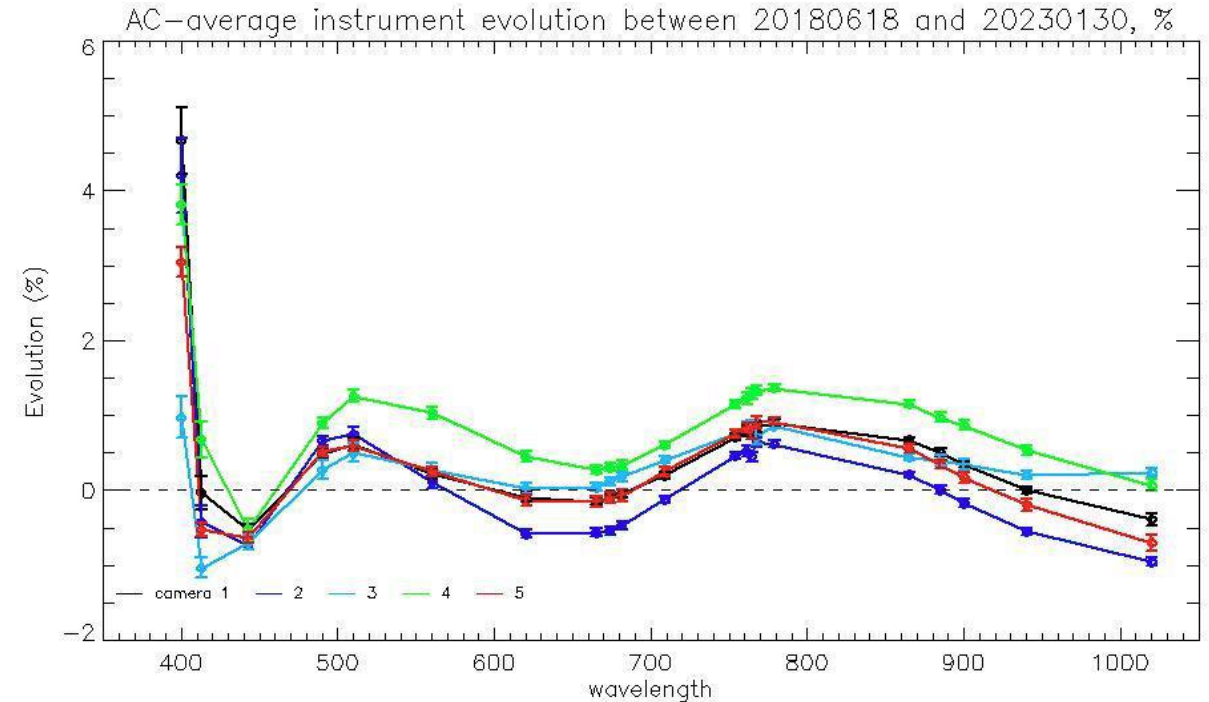
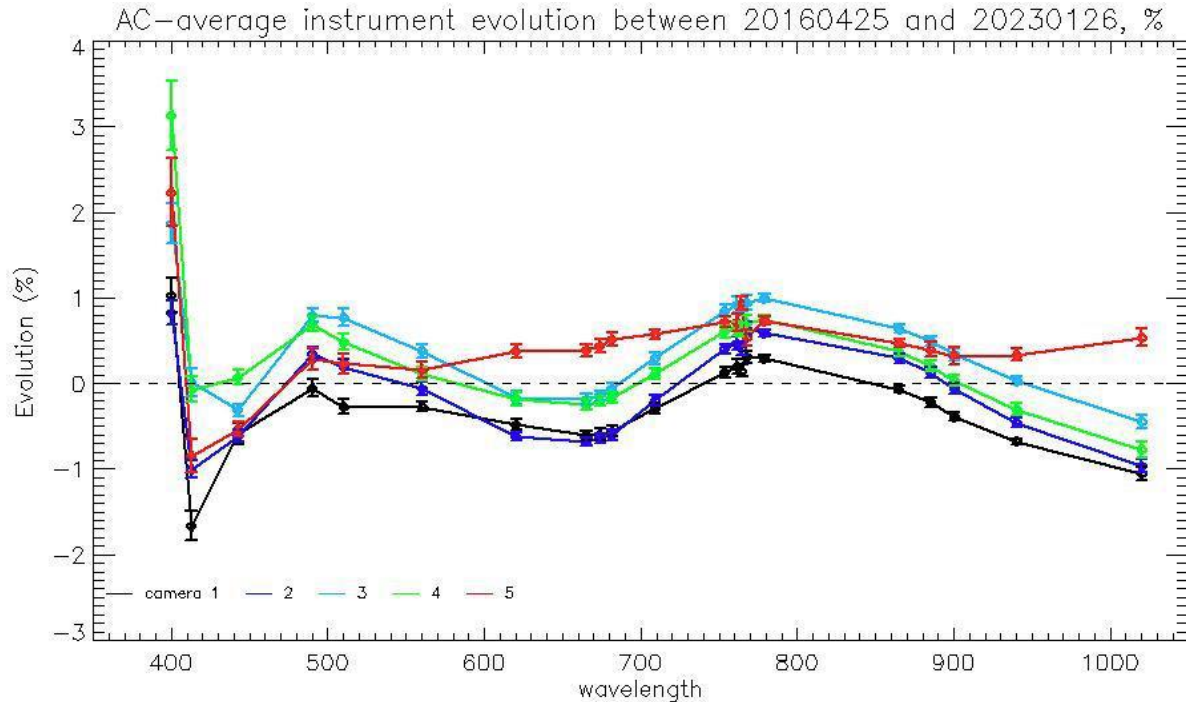
S02/S03 calibration sequence based on diffuser 1 and erbium doped diffuser



S09 calibration sequence based on O2 absorption and Fraunhofer Lines

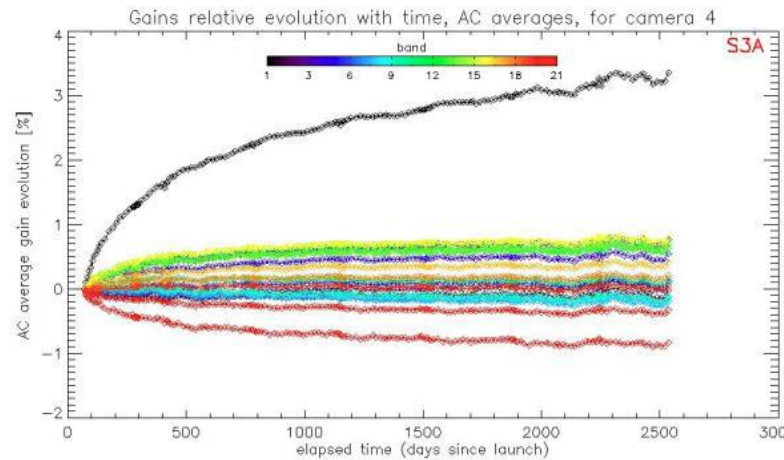
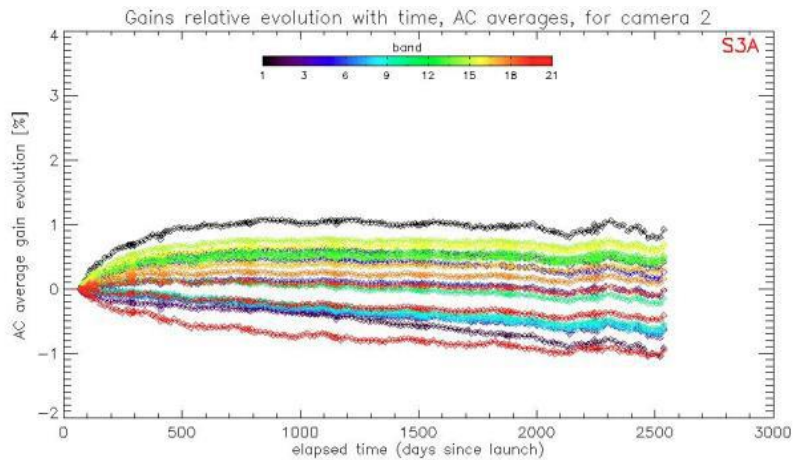
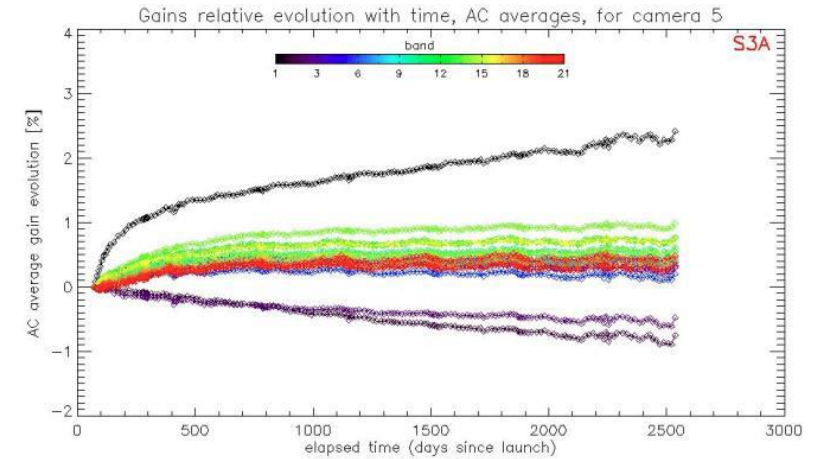
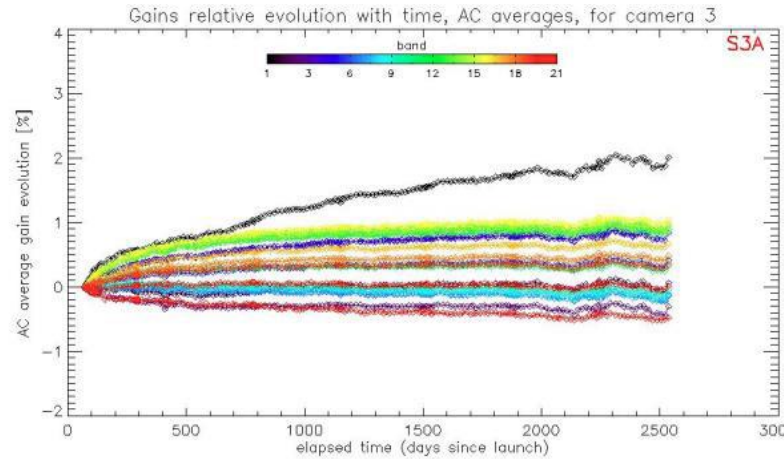
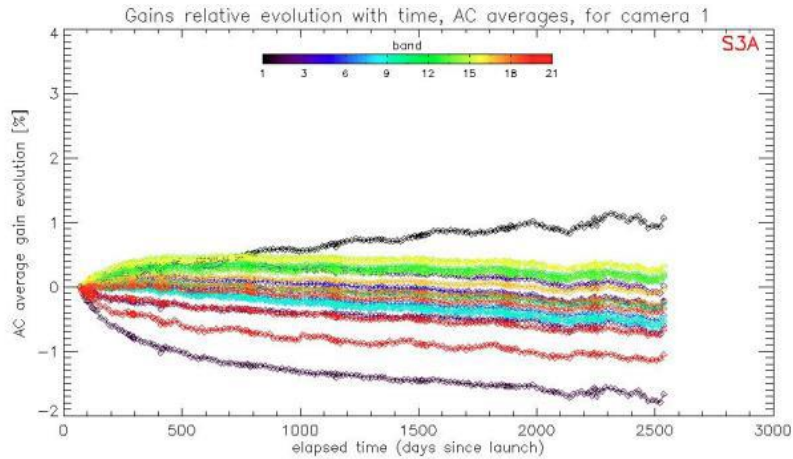


OLCI RADIOMETRIC MODEL EVOLUTION



- **Within 1.5% but @400 nm (3.2% for A, 4.7% for B) so the evolution is slowing down and stabilising**
- **Common spectral shape, but S3A-C5 specific**

OLCI-A RADIOMETRIC GAIN EVOLUTION

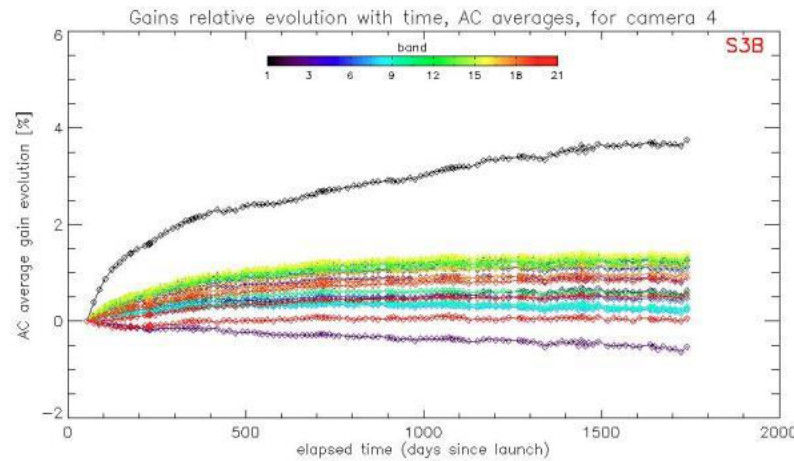
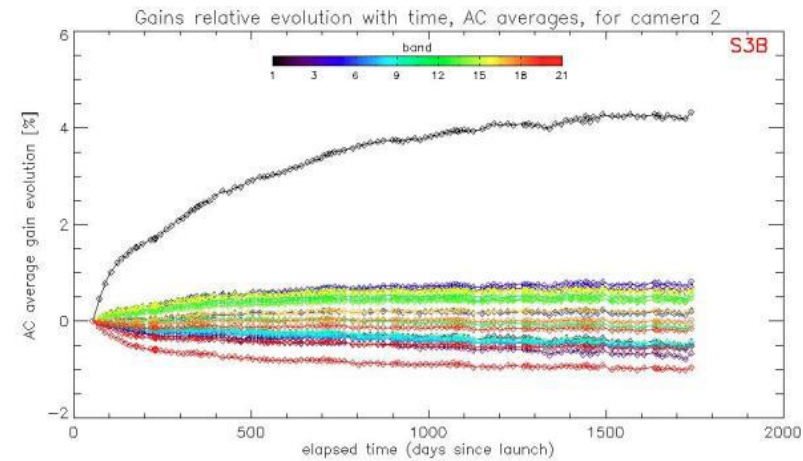
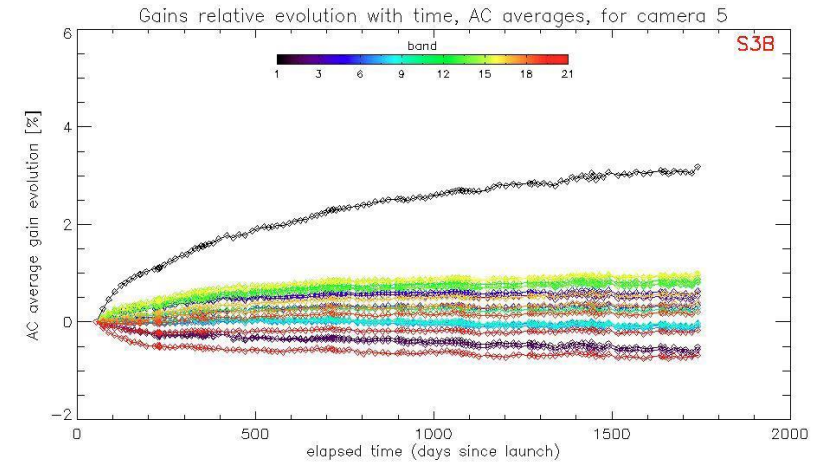
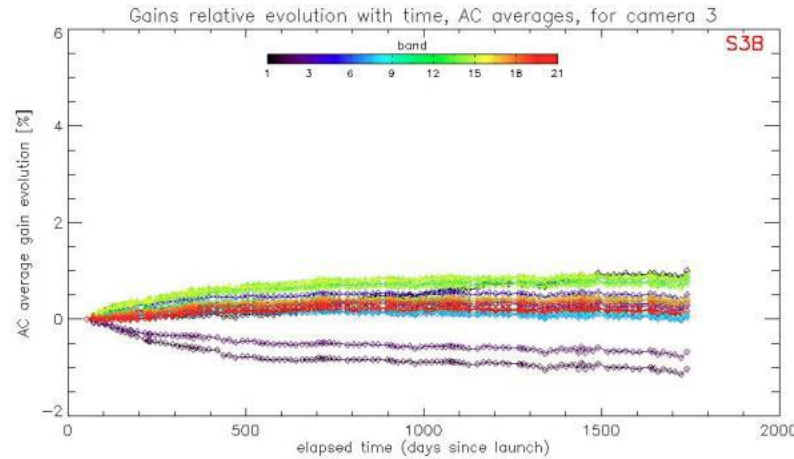
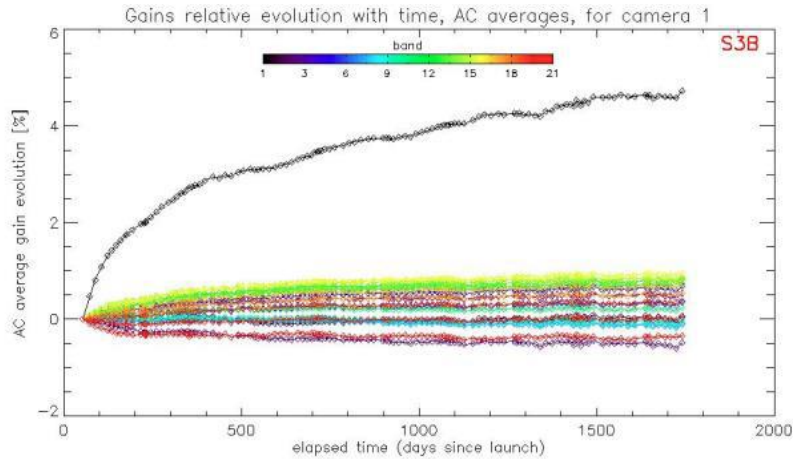


S3-A Gain ratios $G(t)/G(t_0)$, in-flight BRDF models

Camera 2 most stable and camera 4 Band Oa1 the worst at $\sim 3.3\%$



OLCI-B RADIOMETRIC GAIN EVOLUTION

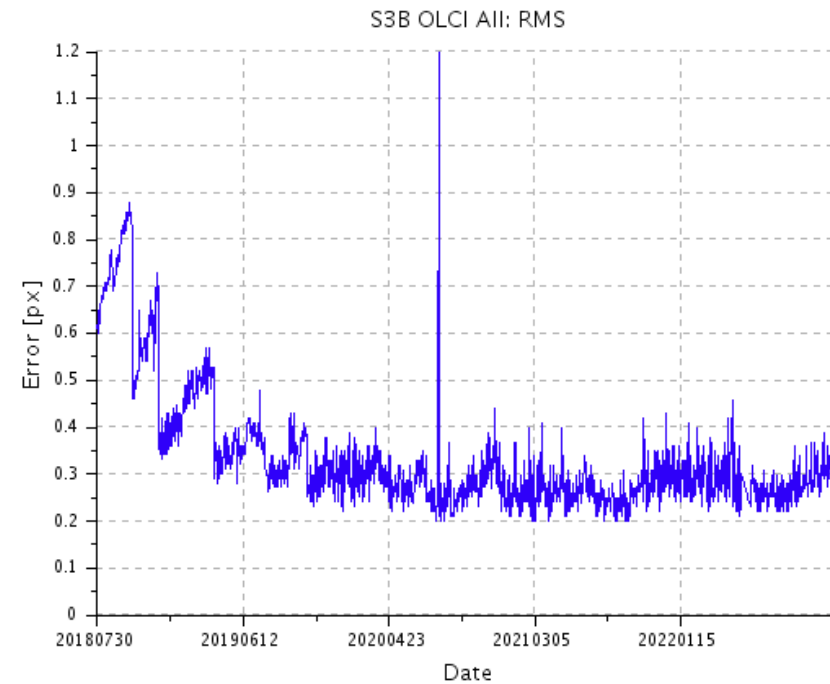
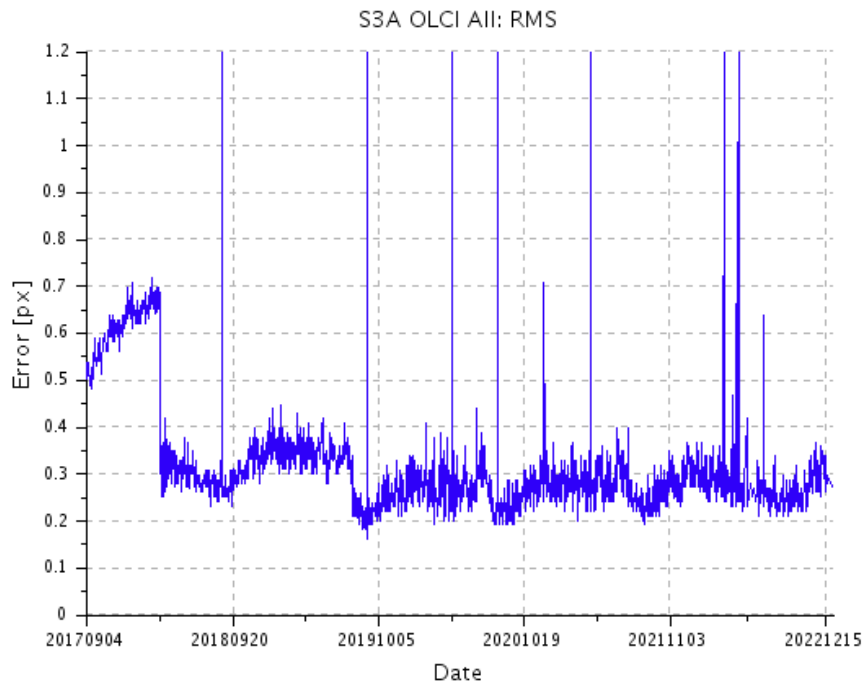


S3-B Gain ratios $G(t)/G(t_0)$, in-flight BRDF models

Camera 3 most stable and camera 1 Band Oa1 the worst at $\sim 4.7\%$



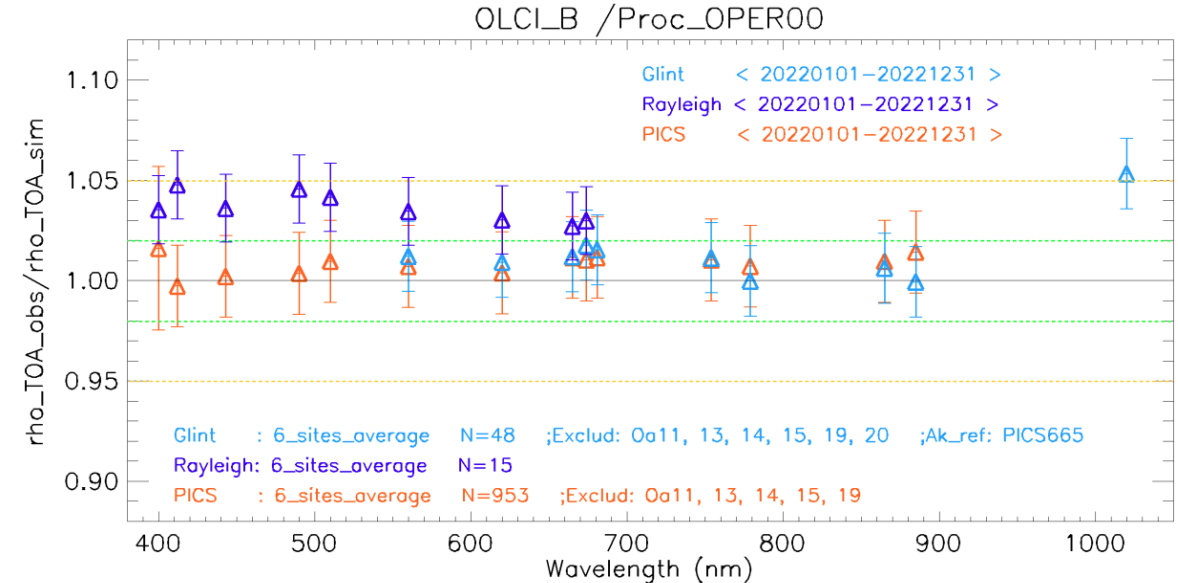
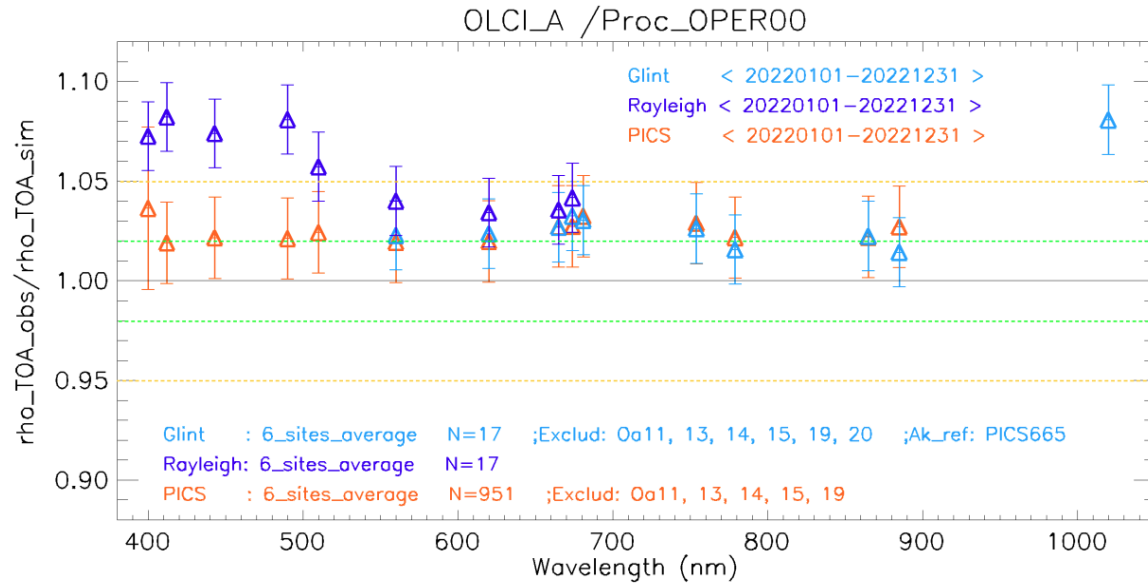
OLCI GEOMETRIC CALIBRATION



Both missions remain compliant within the overall 0.5 pixel RMS requirement. The MPC provide recalibrations to account for any drift. OLCI-B is recalibrated more frequently due to a persisting ACT drift that is however slowing down.



OLCI RADIOMETRIC VALIDATION – VICARIOUS CALIBRATION



Vicarious calibration results demonstrate persistent bright bias larger for A than B. ~2-3% for A and ~1-2% for B.



NEXT EVOLUTIONS OF SLSTR LEVEL-1 UNDER CONSIDERATION

Medium-term:

- Surface classification.

- Online Quality Check decision tree

Long term:

- S7/8/9 mis-registration issues.

- IPF quality control.

- Refine uncertainties on solar channels.

- Further evolution of the F1 geo-referencing for oblique views and evolutions flagging related to F1 over-shooting (for FRP applications).

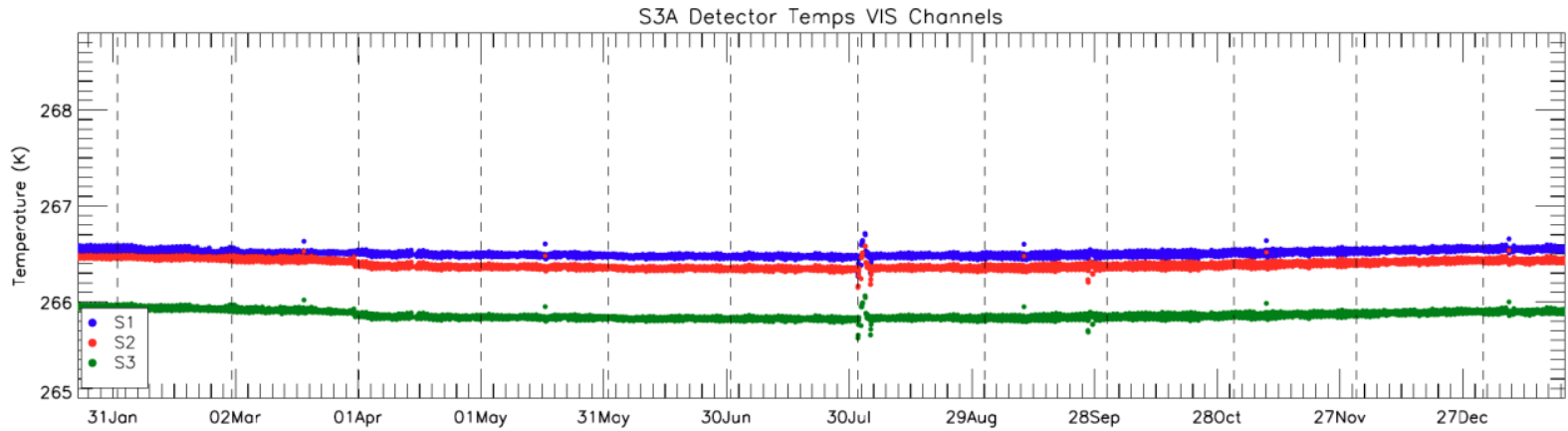
- Update to ECMWF hourly fields (pending investigations).

- L1 uncertainties (and ADF).

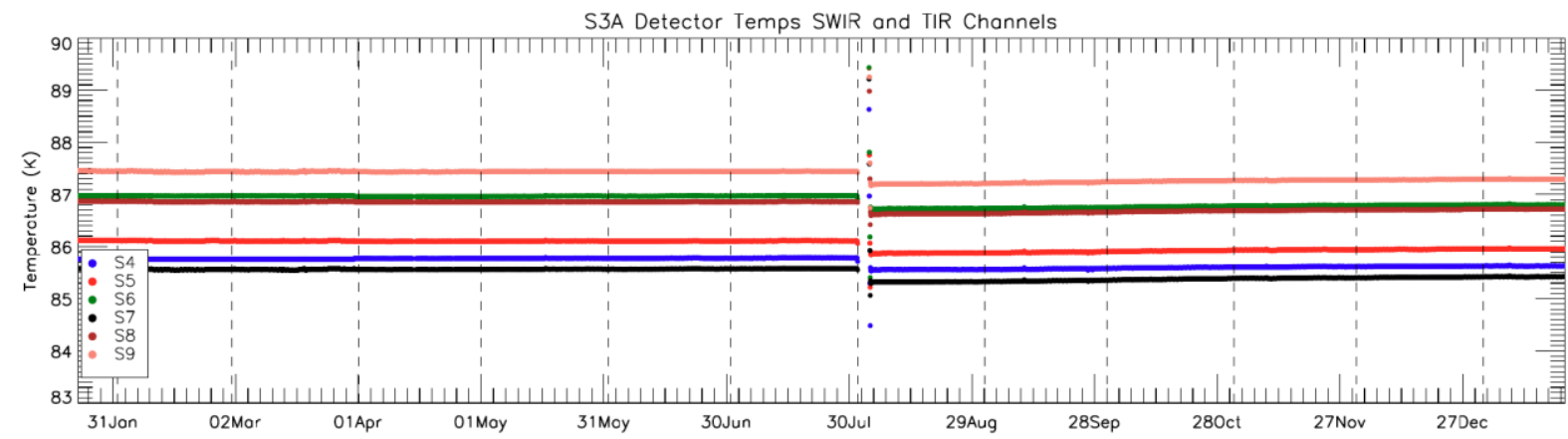
- Further validation of the VIS-NIR-SWIR calibration (dark targets, stray light, inter band) + F1 + Moon.



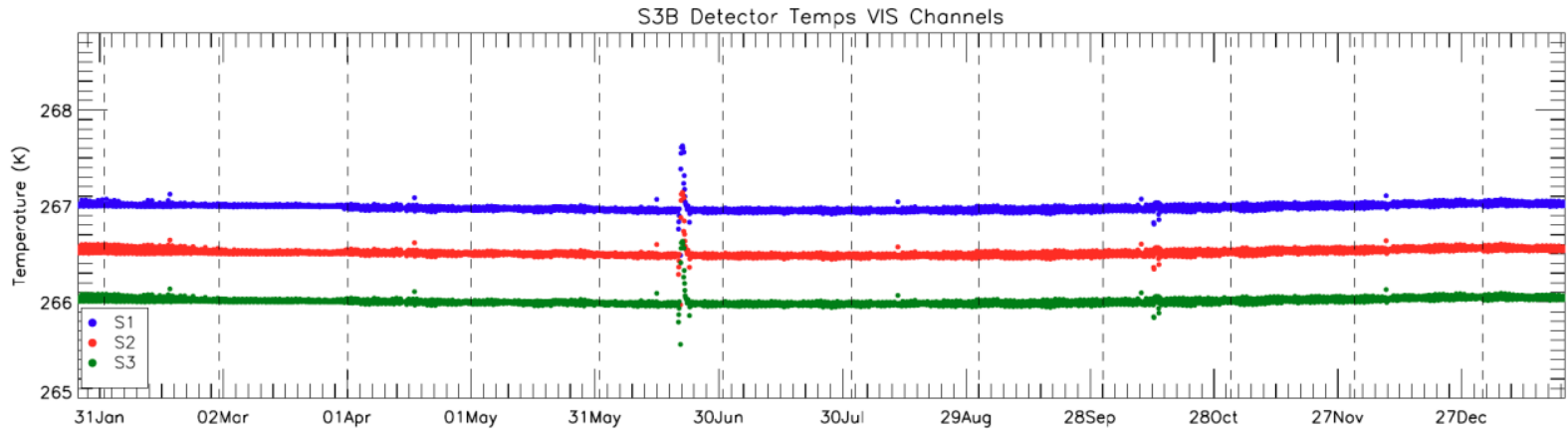
SLSTR DETECTOR TEMPERATURES S-3A



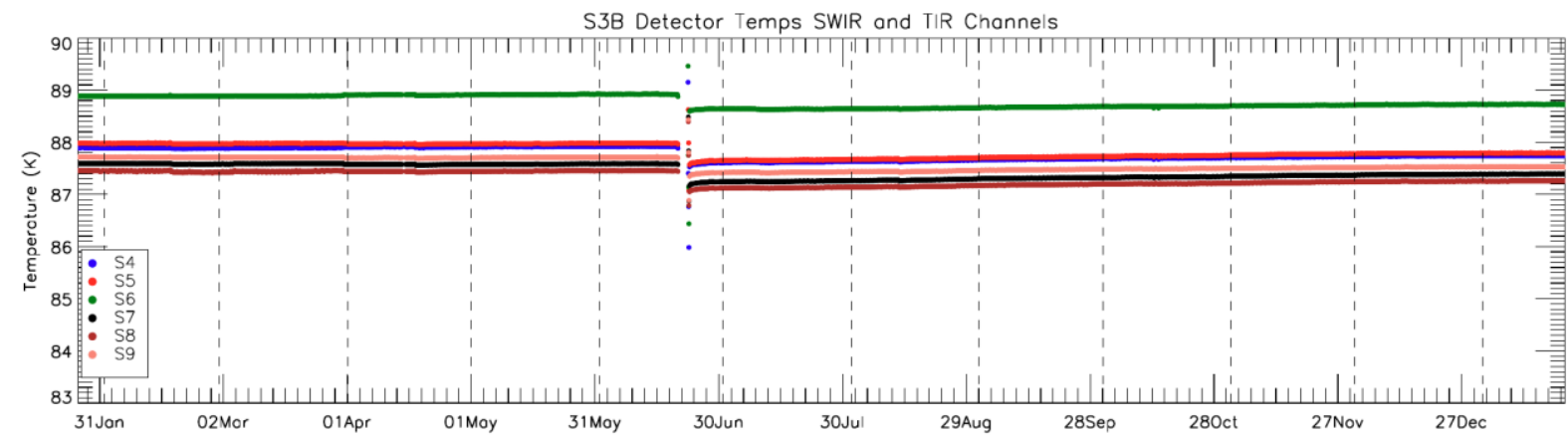
SLSTR-A detector temperatures for each channel from 1st Jan 2022 to end of Jan 2023. The discontinuity for the infrared channels occurs where the FPA was heated for decontamination in July. The vertical dashed lines indicate the start and end of each cycle.



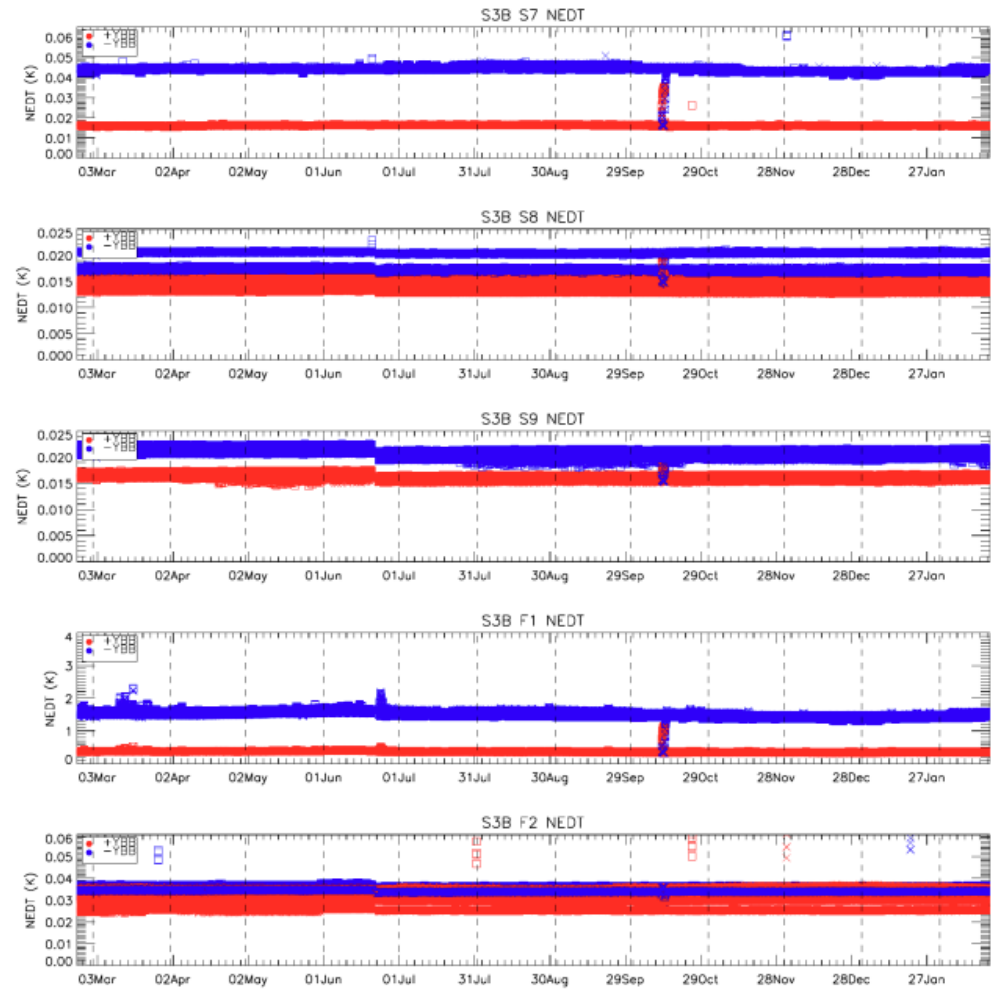
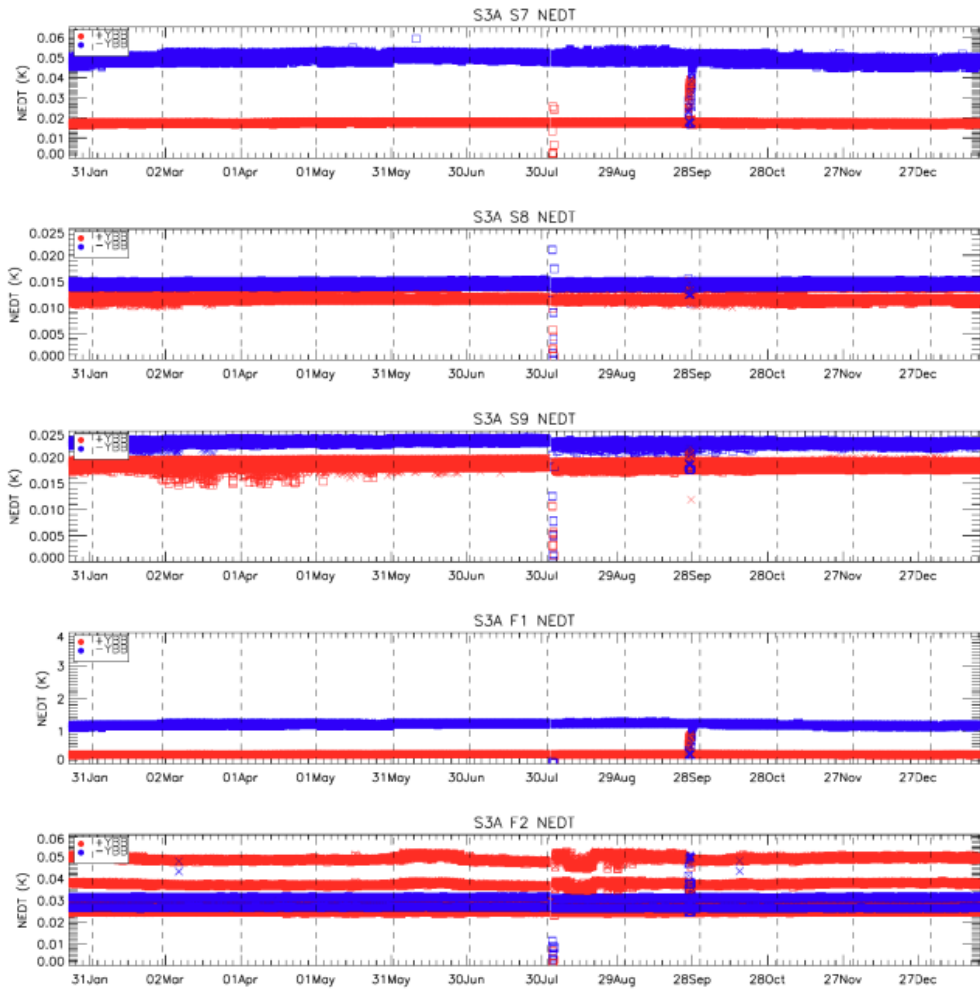
SLSTR DETECTOR TEMPERATURES S-3B



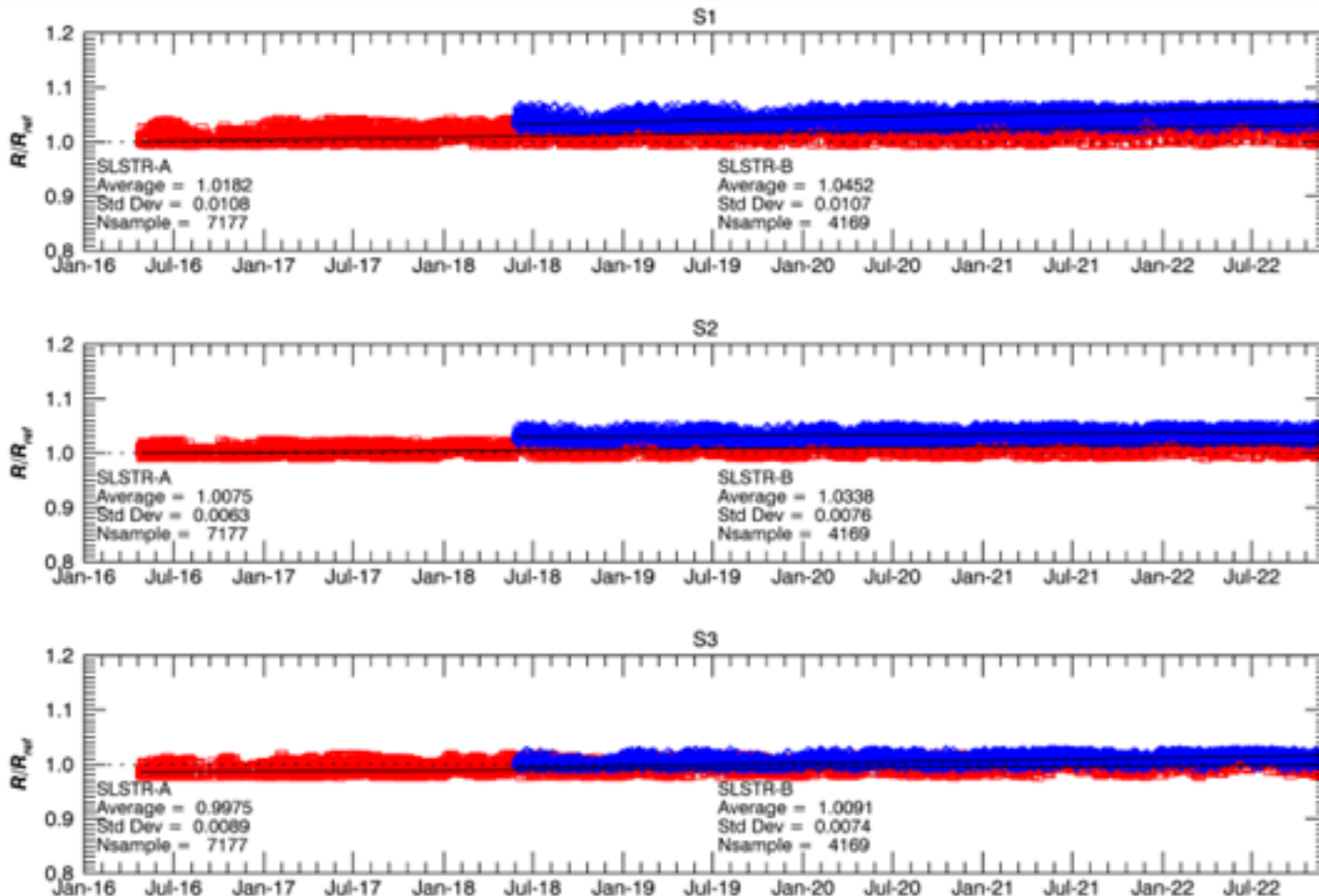
SLSTR-B detector temperatures for each channel from Jan 2022 to end of Jan 2023. The discontinuity in the IR channels in June 2022 is a result of the anomaly and subsequent decontamination. The vertical dashed lines indicate the start and end of each cycle.



SLSTR NEDT DERIVED FROM BLACKBODIES REMAIN STABLE AND WITHIN REQUIREMENTS

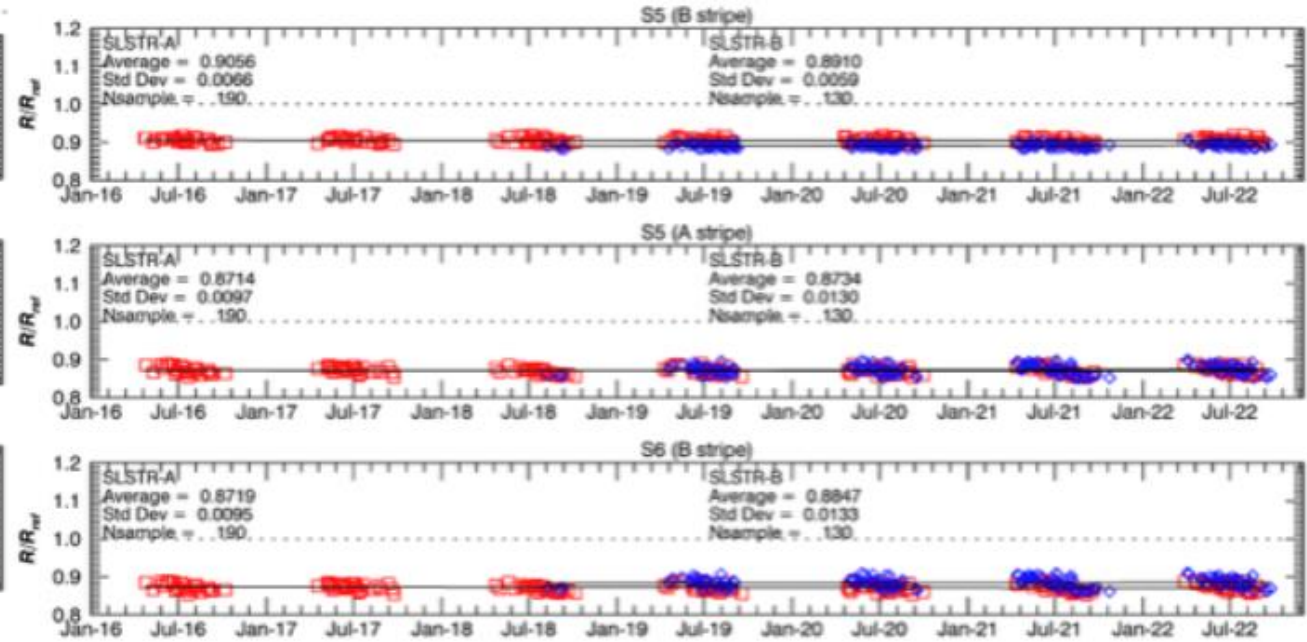
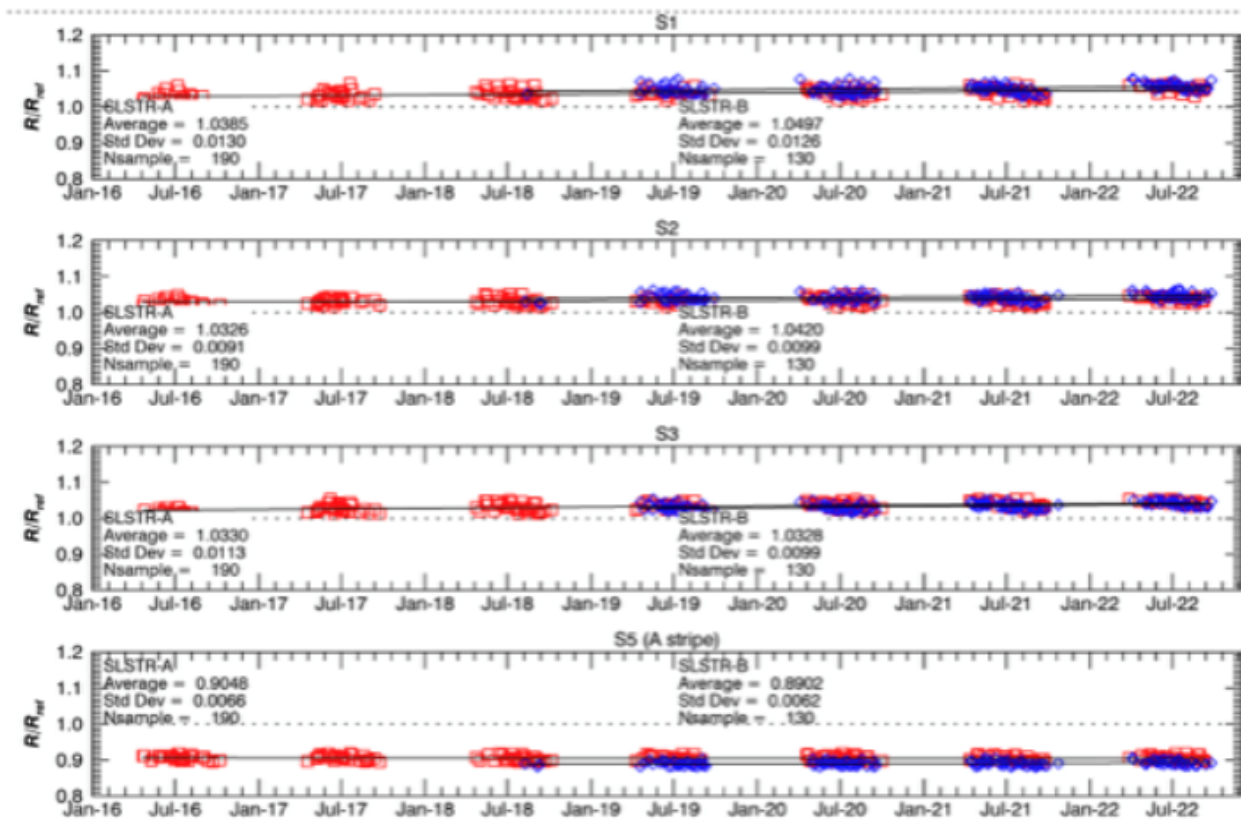


SLSTR VIS/SWIR RADIOMETRIC VALIDATION



Latest MPC Vicarious Calibration Results for Nadir wrt OLCI (red 3A and blue 3B). Overall the performance is stable with a minor drift that we allow users to correct for.

SLSTR VIS/SWIR RADIOMETRIC VALIDATION



Latest MPC Vicarious Calibration Results for Nadir wrt MODIS (red 3A and blue 3B) over desert sites. This time series also shows a stable performance and the persistent significant negative bias for S5 and S6



VIS/SWIR CALIBRATION CORRECTIONS

Valid for SLSTR-A and SLSTR-B

Nadir View

	S1	S2	S3	S5	S6
Correction	0.97	0.98	0.98	1.11	1.13
Uncertainty	0.03	0.02	0.02	0.02	0.02
Input Analysis	UoAz Rayference CNES	UoAz MPC (RAL) Rayference CNES	UoAz MPC (RAL) Rayference CNES	UoAz MPC (RAL) Rayference CNES	UoAz MPC (RAL) Rayference CNES

Oblique View

	S1	S2	S3	S5	S6
Correction	0.94	0.95	0.95	1.04	1.07
Uncertainty	0.05	0.03	0.03	0.03	0.05
Input Analysis	Rayference CNES	MPC (RAL) Rayference CNES	MPC (RAL) Rayference CNES	MPC (RAL) Rayference CNES	Rayference CNES

Note: Uncertainty estimates are at k=1.

Version 3.0 of the document available from Sentinel online (<https://bit.ly/3fJoaQ2>) and <https://www.eumetsat.int/sea-surface-temperature-resources>

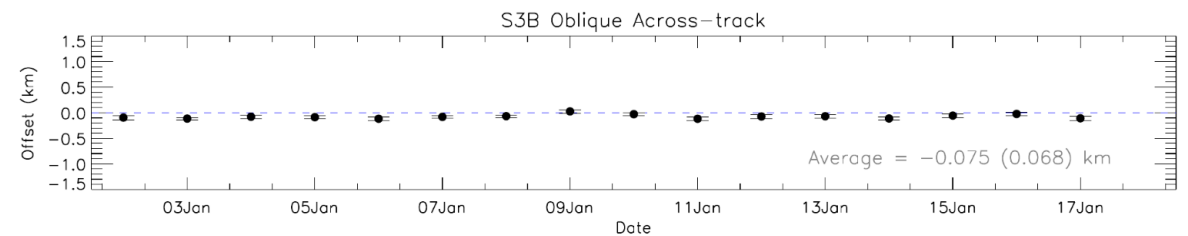
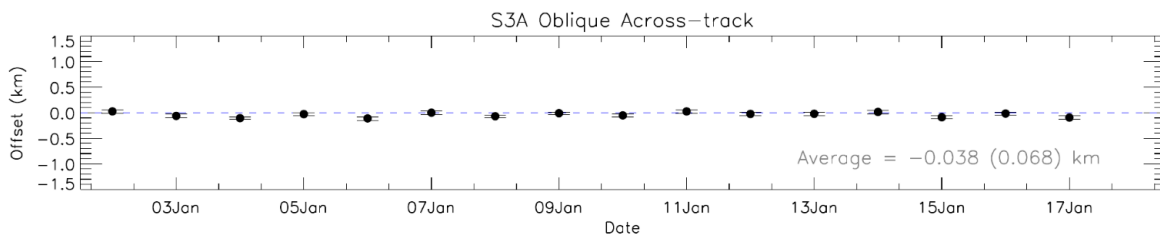
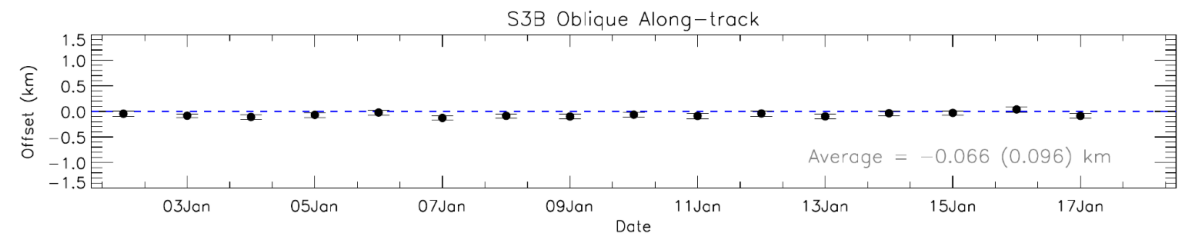
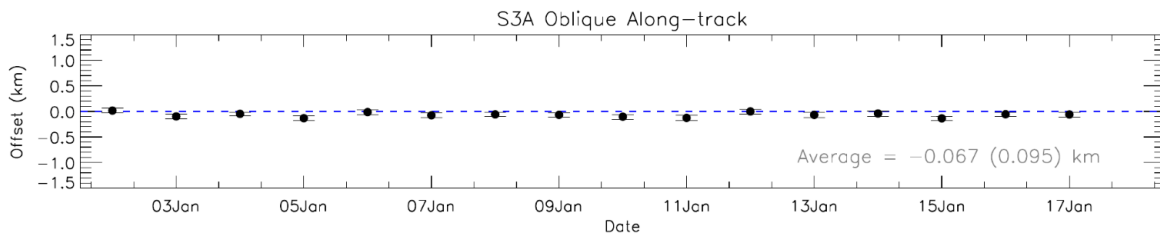
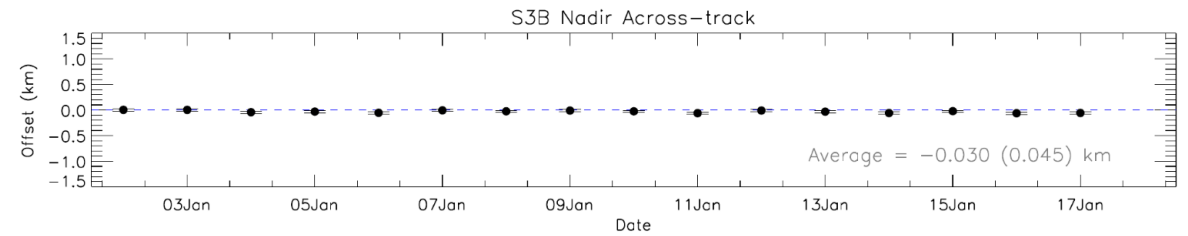
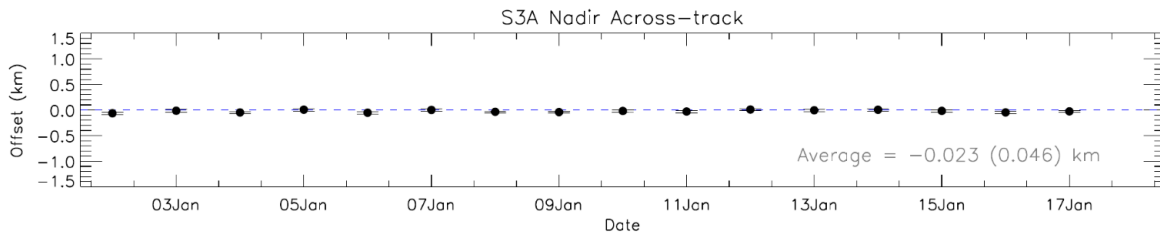
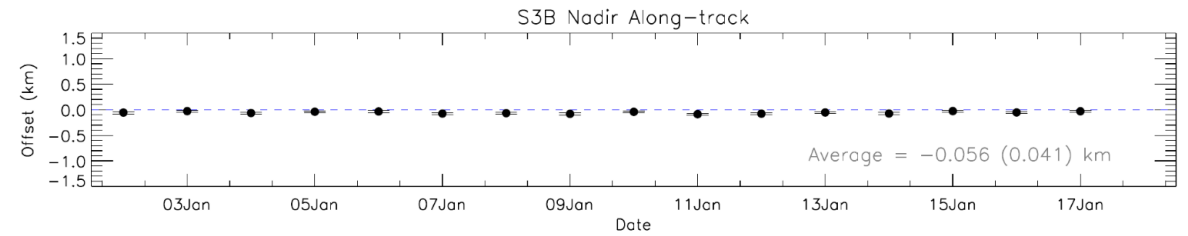
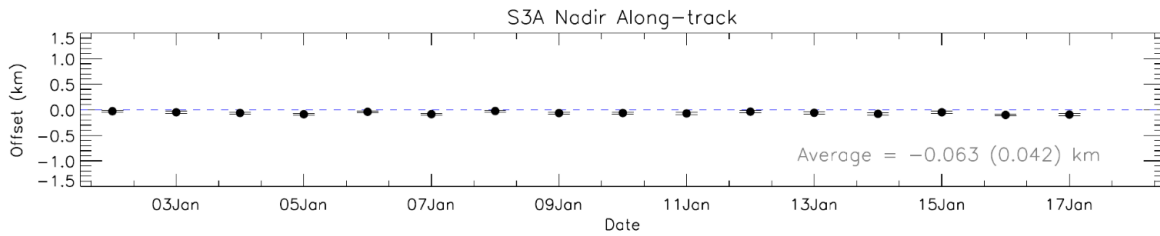
Not applied to the L1 product to L2 users must apply these coefficients within their own processing

$L1_Radiance_Corrected = L1_Radiance \times Adjustment_Factor$

Long-term drift corrections were published to users last year.



SLSTR GEOMETRIC CALIBRATION VALIDATION



THANK YOU FOR ATTENTION



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Questions are welcome