PREPARATION AND OPERATIONS OF THE MISSION PERFORMANCE CENTRE (MPC) FOR THE COPERNICUS SENTINEL-3 MISSION

S3-A SLSTR Cyclic Performance Report

Cycle No. 012

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Disclaimer

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Changes Log

Version	Date	Changes
1.0	09/01/2017	First Version

List of Changes

Version	Section	Answers to RID	Changes



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1 Instrument monitoring

1.1 Instrument temperatures

- Instrument temperatures have been stable and consistent with previous operations (see Figure 1).
- Blackbody, baffle and OME temperatures all showed a systematic increase in temperature during the previous two cycles, but have levelled out during this cycle. This is due to the fact that the Earth was getting closer to the Sun until perihelion on January 3rd causing the instrument to slowly heat up. We expect that the temperatures will now decrease again over the coming cycles as the satellite moves away from perihelion.

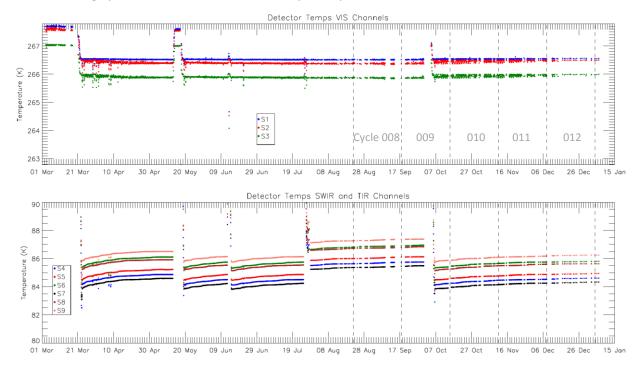


Figure 1: Detector temperatures for each channel from 1st March 2016. Discontinuities occur for the infrared channels where the FPA was heated for decontamination or following an anomaly. The vertical dashed lines indicate the start and end of each cycle.

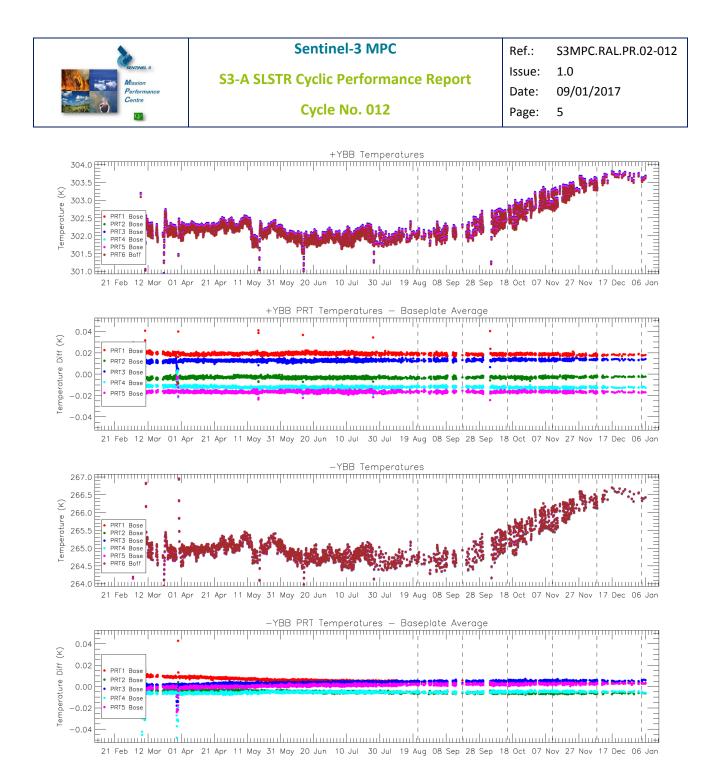


Figure 2: Blackbody temperature and baseplate gradient trends. The vertical dashed lines indicate the start and end of each cycle.



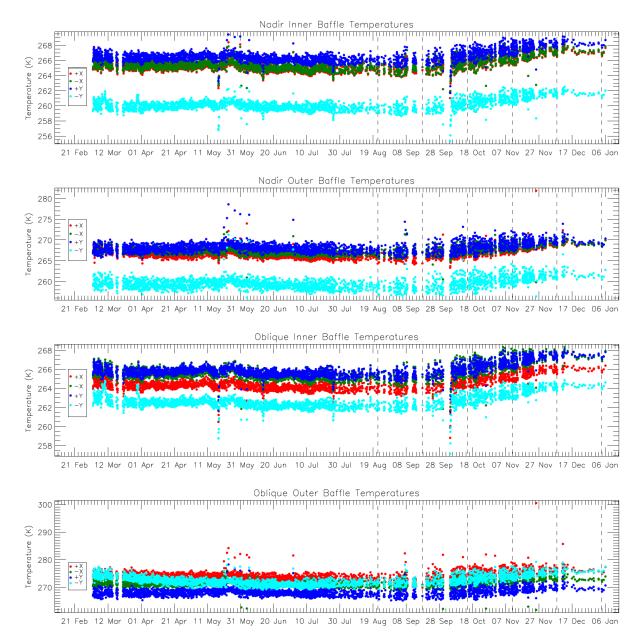


Figure 3: Baffle temperature trends. The vertical dashed lines indicate the start and end of each cycle.



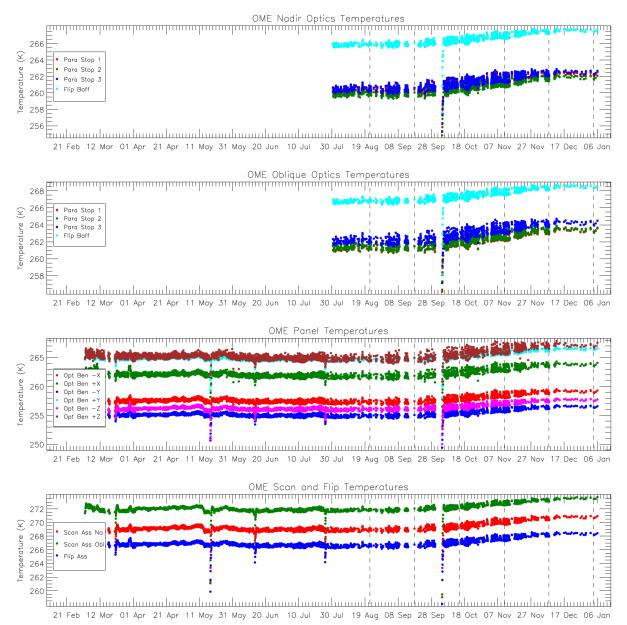


Figure 4: OME temperature trends showing the paraboloid stops and flip baffle (top two plots) and optical bench and scanner and flip assembly (lower two plots). The top two plots only show data starting from 30th July 2016. The vertical dashed lines indicate the start and end of each cycle.



1.2 Scanner performance

Scanner performance has been consistent with previous operations and within required limits.

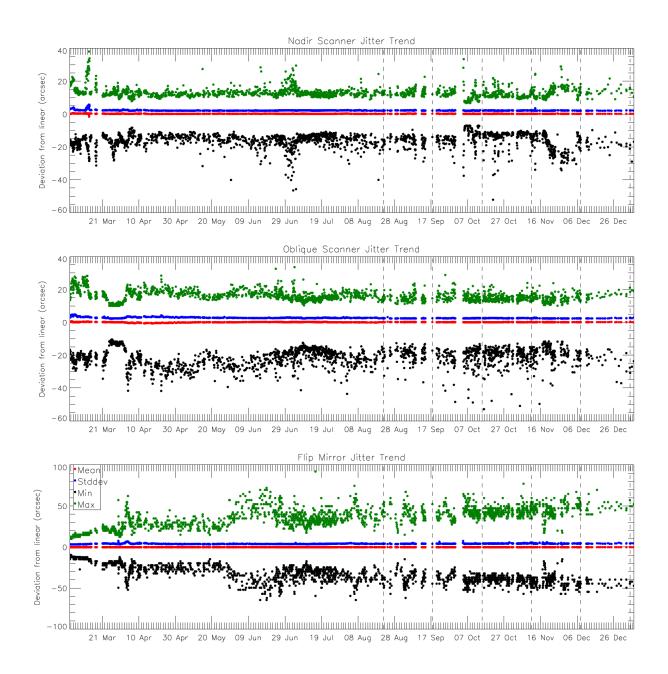


Figure 5: Scanner and flip jitter, showing mean, stddev and max/min position compared to the expected one for the nadir view. The vertical dashed lines indicate the start and end of each cycle.



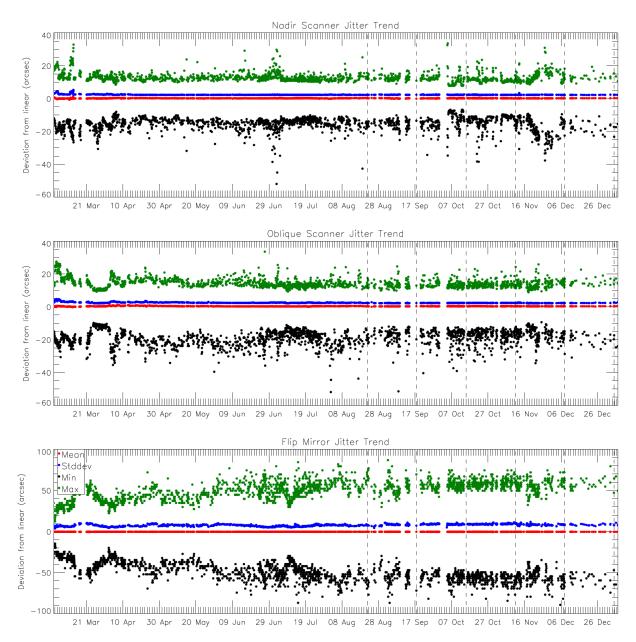


Figure 6: Scanner and flip jitter, showing mean, stddev and max/min position compared to the expected one for the oblique view. The vertical dashed lines indicate the start and end of each cycle.

1.3 Detector noise levels

1.3.1 VIS and SWIR channel signal-to-noise

The VIS and SWIR channel signal-to-noise is stable and consistent with previous operations.



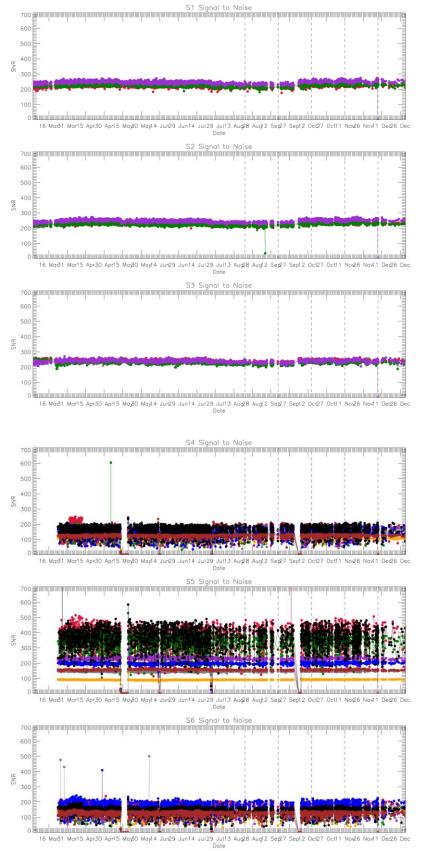


Figure 7: VIS and SWIR channel signal-to-noise. Different colours indicate different detectors.



1.3.2 TIR channel NEDT

The thermal channel NEDT values are consistent with previous operations and within the requirements.

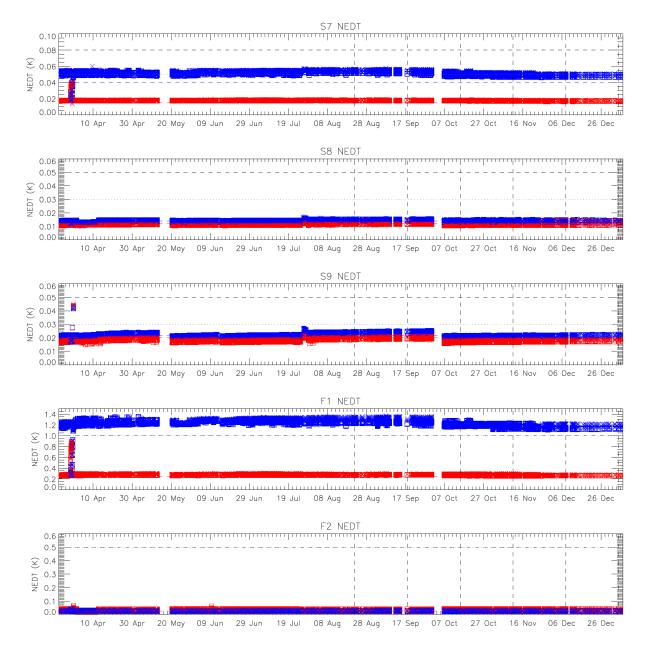


Figure 8: NEDT trend for the thermal channels. Blue points were calculated from the cold blackbody signal and red points from the hot blackbody. Horizontal lines indicate the requirement (dashed) and goal (dotted) as well as the measured values on ground (red and blue dashed).



1.4 Calibration factors

1.4.1 VIS and SWIR VISCAL signal response

Signals from the VISCAL source for the VIS channels show oscillations due to the build up of ice on the optical path within the FPA. Decontamination is carried out periodically, in order to warm up the FPA and remove the ice. The last decontamination cycle was successfully performed at the beginning of October in the middle of cycle 009.

Yaw manoeuvres were carried out as described in Section 2, and these affected the VISCAL signal, which shows a slightly lower value than the surrounding orbits for both VIS and SWIR channels (indicated by the red arrows in Figure 9 and Figure 10 on 17th, 22nd, 29th November and 7th December). This is due to the changed solar azimuth angle on the diffuser. See Section 2 for more details.

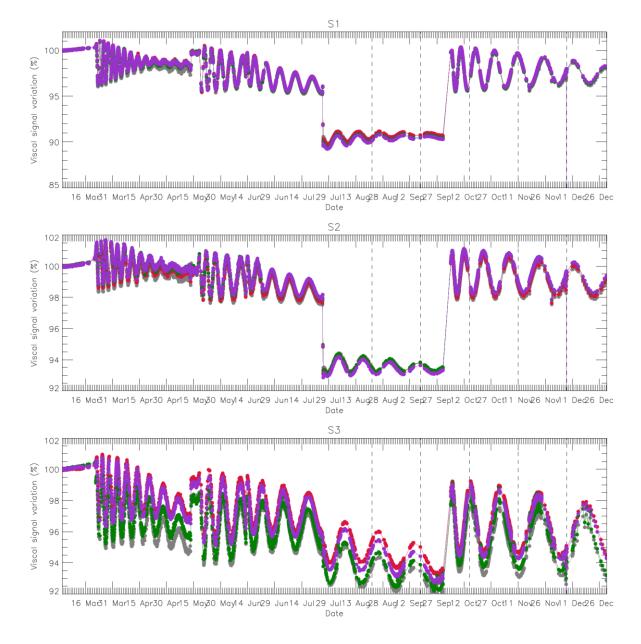
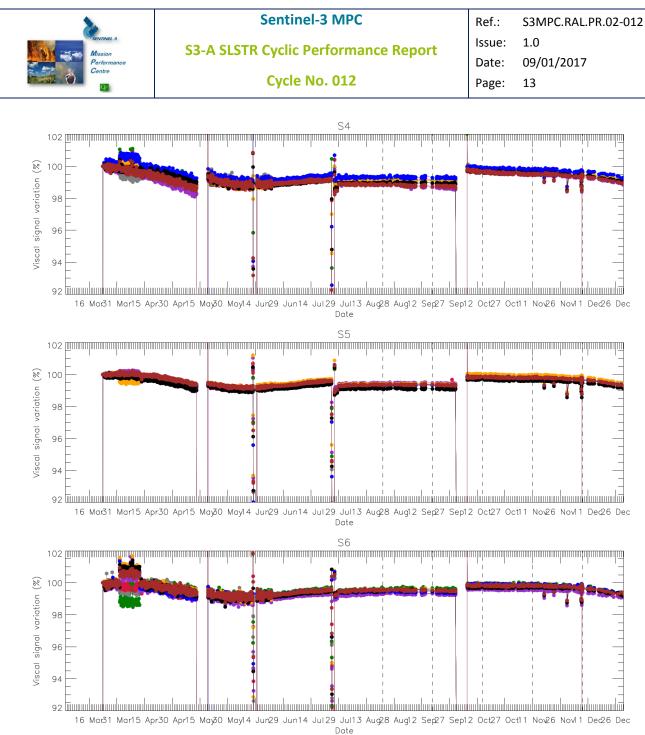


Figure 9: VISCAL signal trend for VIS channels (nadir view).



Date

Figure 10: VISCAL signal trend for SWIR channels (nadir view).



2 Events

SLSTR has been switched on and operating nominally during the cycle, with SUE scanning and autonomous switching between day and night modes.



3 Appendix A

Other reports related to the Optical mission are:

S3-A OLCI Cyclic Performance Report, Cycle No. 012 (ref. S3MPC.ACR.PR.01-012)

All Cyclic Performance Reports are available on MPC pages in Sentinel Online website, at: <u>https://sentinel.esa.int</u>

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