

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

S3 SLSTR Cyclic Performance Report

S3-A

Cycle No. 069

Start date: 24/02/2021

End date: 23/03/2021

S3-B

Cycle No. 050

Start date: 05/03/2021

End date: 01/04/2021



*Mission
Performance
Centre*



Ref.: S3MPC.RAL.PR.02-069-050

Issue: 1.0

Date: 08/04/2021

Contract: 4000111836/14/I-LG

Customer:	ESA	Document Ref.:	S3MPC.RAL.PR.02-069-050
Contract No.:	4000111836/14/I-LG	Date:	08/04/2021
		Issue:	1.0

Project:	PREPARATION AND OPERATIONS OF THE MISSION PERFORMANCE CENTRE (MPC) FOR THE COPERNICUS SENTINEL-3 MISSION		
Title:	S3 SLSTR Cyclic Performance Report		
Author(s):	SLSTR ESLs		
Approved by:	D. Smith, SLSTR ESL Coordinator	Authorized by	Frédéric Rouffi, OPT Technical Performance Manager
Distribution:	ESA, EUMETSAT, S3MPC consortium		
Accepted by ESA	S. Dransfeld, MPC Deputy TO for OPT P. Féménias, MPC TO		
Filename	S3MPC.RAL.PR.02-069-050 - i1r0 - SLSTR Cyclic Report 069-050.docx		

Disclaimer

The work performed in the frame of this contract is carried out with funding by the European Union. The views expressed herein can in no way be taken to reflect the official opinion of either the European Union or the European Space Agency.



	<p style="text-align: center;">Sentinel-3 MPC S3 SLSTR Cyclic Performance Report S3A Cycle No. 069 – S3B Cycle No. 050</p>	Ref.: S3MPC.RAL.PR.02-069-050 Issue: 1.0 Date: 08/04/2021 Page: iii
--	---	--

Changes Log

Version	Date	Changes
1.0	08/04/2021	First Version

List of Changes

Version	Section	Answers to RID	Changes

 <p>Sentinel-3 MPC</p> <p>S3 SLSTR Cyclic Performance Report</p> <p>S3A Cycle No. 069 – S3B Cycle No. 050</p>	Ref.: S3MPC.RAL.PR.02-069-050 Issue: 1.0 Date: 08/04/2021 Page: iv
--	---

Table of content

1	PROCESSING BASELINE VERSION	1
2	INSTRUMENT MONITORING	2
2.1	INSTRUMENT TEMPERATURES.....	2
2.2	DETECTOR TEMPERATURES	4
2.3	SCANNER PERFORMANCE	6
2.4	BLACK-BODIES	8
2.5	DETECTOR NOISE LEVELS	10
2.5.1	<i>SLSTR-A VIS and SWIR channel signal-to-noise</i>	<i>10</i>
2.5.2	<i>SLSTR-B VIS and SWIR channel signal-to-noise</i>	<i>12</i>
2.5.3	<i>SLSTR-A TIR channel NEDT</i>	<i>13</i>
2.5.4	<i>SLSTR-B TIR channel NEDT.....</i>	<i>15</i>
2.6	CALIBRATION FACTORS	17
2.6.1	<i>VIS and SWIR radiometric response</i>	<i>17</i>
3	LEVEL-1 PRODUCT VALIDATION	22
3.1	GEOMETRIC CALIBRATION/VALIDATION	22
3.2	RADIOMETRIC VALIDATION	24
3.3	IMAGE QUALITY.....	28
4	LEVEL-2 SST VALIDATION	29
5	LEVEL 2 LST VALIDATION.....	30
5.1	CATEGORY-A VALIDATION	ERROR! BOOKMARK NOT DEFINED.
5.2	CATEGORY-C VALIDATION.....	ERROR! BOOKMARK NOT DEFINED.
5.3	LEVEL-3C ASSESSMENT	ERROR! BOOKMARK NOT DEFINED.
6	EVENTS	41
6.1	SLSTR-A	41
6.2	SLSTR-B	41
7	APPENDIX A	42

 Sentinel-3 MPC S3 SLSTR Cyclic Performance Report S3A Cycle No. 069 – S3B Cycle No. 050	Ref.: S3MPC.RAL.PR.02-069-050 Issue: 1.0 Date: 08/04/2021 Page: v
--	--

List of Figures

- Figure 1: OME temperature trends for SLSTR-A Cycle 069 (left) and SLSTR-B Cycle 050 (right) showing the paraboloid stops and flip baffle (top two plots) and optical bench and scanner and flip assembly (lower two plots). The vertical dashed lines indicate the start and end of the cycle. Each dot represents the average temperature in one orbit. ----- 2
- Figure 2: Baffle temperature trends for SLSTR-A Cycle 069 (left) and SLSTR-B Cycle 050 (right). The vertical dashed lines indicate the start and end of the cycle. Each dot represents the average temperature in one orbit. ----- 3
- Figure 3: SLSTR-A detector temperatures for each channel for the last year of operations. Discontinuities occur for the infrared channels where the FPA was heated for decontamination. The vertical dashed lines indicate the start and end of each cycle. Each dot represents the average temperature in one orbit. The different colours indicate different detectors. ----- 4
- Figure 4: SLSTR-B detector temperatures for each channel for the last year of operations. Discontinuities occur for the infrared channels where the FPA was heated for decontamination. The vertical dashed lines indicate the start and end of each cycle. Each dot represents the average temperature in one orbit. The different colours indicate different detectors. ----- 5
- Figure 5: SLSTR-A scanner and flip jitter for Cycle 069, showing mean and stddev from expected position per orbit (red and blue respectively) for the nadir view (left) and oblique view (right). The plots show the nadir scanner (top), oblique scanner (middle) and flip mirror (bottom). ----- 6
- Figure 6: SLSTR-B scanner and flip jitter long term in Cycle 050, showing mean and stddev difference from expected position per orbit (red and blue respectively) for the nadir view (left) and oblique view (right). The plots show the nadir scanner (top), oblique scanner (middle) and flip mirror (bottom). ----- 7
- Figure 7: SLSTR-A blackbody temperature and baseplate gradient trends during Cycle 069. The vertical dashed lines indicate the start and end of the cycle. Each dot represents the average temperature in one orbit. ----- 8
- Figure 8: SLSTR-A and SLSTR-B long term trends in average +YBB temperature, showing yearly variation. The vertical dashed lines approximately indicate the 1st January 2017, 2018, 2019, 2020 and 2021. ----- 9
- Figure 9: SLSTR-B blackbody temperature and baseplate gradient trends during Cycle 050. The vertical dashed lines indicate the start and end of the cycle. Each dot represents the average temperature in one orbit. ----- 9
- Figure 10: VIS and SWIR channel signal-to-noise of the measured VISCAL signal in each orbit for the last year of operations for SLSTR-A. Different colours indicate different detectors. The vertical dashed lines indicate the start and end of each cycle. ----- 11
- Figure 11: SLSTR-A NEDT trend for the thermal channels in Cycle 069. Blue points were calculated from the cold blackbody signal and red points from the hot blackbody. The square symbols show results calculated from the nadir view and crosses show results from the oblique view. Results are plotted for all detectors and integrators, which is why there are several different levels within the same colour points (particularly for S8 and F2). ----- 13

 Sentinel-3 MPC S3 SLSTR Cyclic Performance Report S3A Cycle No. 069 – S3B Cycle No. 050	Ref.: S3MPC.RAL.PR.02-069-050 Issue: 1.0 Date: 08/04/2021 Page: vi
--	---

Figure 12: SLSTR-B NEDT trend for the thermal channels in Cycle 050. Blue points were calculated from the cold blackbody signal and red points from the hot blackbody. The square symbols show results calculated from the nadir view and crosses show results from the oblique view. Results are plotted for all detectors and integrators, which is why there are several different levels within the same colour points (particularly for S8 and F2). ----- 15

Figure 13: Variation of the radiometric gain derived from the VISCAL signals for SLSTR-A VIS channels for the last year of operations (nadir view). Different colours represent different detectors. The vertical dashed lines indicate the start and end of each cycle. ----- 18

Figure 14: Variation of the radiometric gain derived from the VISCAL signals for SLSTR-A SWIR channels for the last year of operations (nadir view). Different colours represent different detectors. The vertical dashed lines indicate the start and end of each cycle. ----- 19

Figure 15: Variation of the radiometric gain derived from the VISCAL signals for SLSTR-B VIS channels for the past year (nadir view). Different colours represent different detectors. The vertical dashed lines indicate the start and end of each cycle. ----- 20

Figure 16: Variation of the radiometric gain derived from the VISCAL signals for SLSTR-B SWIR channels for the past year (nadir view). Different colours represent different detectors. The vertical dashed lines indicate the start and end of each cycle. ----- 21

Figure 17: SLSTR-A daily offset results in km from the GeoCal Tool analysis for Nadir along- and across-track (top two plots) and Oblique along- and across-track (bottom two plots) for Cycle 069. The error bars show the standard deviation.----- 22

Figure 18: SLSTR-B daily offset results in km from the GeoCal Tool analysis for Nadir along- and across-track (top two plots) and Oblique along- and across-track (bottom two plots) for Cycle 050. The error bars show the standard deviation.----- 23

Figure 19: Ratio of SLSTR-A and OLCI-A radiances for the visible channels in Nadir view using combined results for all desert sites. ----- 24

Figure 20: Ratio of SLSTR-B and OLCI-B radiances for the visible channels in Nadir view using combined results for all desert sites. ----- 25

Figure 21: Ratio of SLSTR-A with AATST radiances in Nadir view using combined results for all desert sites. ----- 25

Figure 22: Ratio of SLSTR-B with AATST radiances in Nadir view using combined results for all desert sites. ----- 26

Figure 21: Ratio of SLSTR-A (red) and SLSTR-B (blue) with MODIS radiances in Nadir view using combined results for all desert sites. ----- 27

Figure 22: Daytime combined SLSTR-A and SLSTR-B Level-1 image for visible channels on 12th March 2021. ----- 28

List of Tables

 Sentinel-3 MPC S3 SLSTR Cyclic Performance Report S3A Cycle No. 069 – S3B Cycle No. 050	Ref.: S3MPC.RAL.PR.02-069-050 Issue: 1.0 Date: 08/04/2021 Page: vii
--	--

Table 1: Average SLSTR-A reflectance factor, and signal-to-noise ratio of the measured VISCAL signal for the last 11 cycles, averaged over all detectors for the nadir view.	10
Table 2: Average SLSTR-A reflectance factor, and signal-to-noise ratio of the measured VISCAL signal for the last 11 cycles, averaged over all detectors for the oblique view.	10
Table 3: Average SLSTR-B reflectance factor, and signal-to-noise ratio of the measured VISCAL signal for the last 11 cycles, averaged over all detectors for the nadir view.	12
Table 4: Average SLSTR-B reflectance factor, and signal-to-noise ratio of the measured VISCAL signal for the last 11 cycles, averaged over all detectors for the oblique view.	12
Table 5: NEDT for SLSTR-A in the last 11 cycles averaged over all detectors for both Earth views towards the hot +YBB (top) and the cold -YBB (bottom).	14
Table 6: NEDT for SLSTR-B in the last 11 cycles averaged over all detectors for both Earth views towards the hot +YBB (top) and the cold -YBB (bottom).	16

 Sentinel-3 MPC S3 SLSTR Cyclic Performance Report S3A Cycle No. 069 – S3B Cycle No. 050	Ref.: S3MPC.RAL.PR.02-069-050 Issue: 1.0 Date: 08/04/2021 Page: 1
--	--

1 Processing Baseline Version

IPF	IPF / Processing Baseline version	Date of deployment
S3A		
SL1	06.17 / 2.73	CGS: 12/11/2020 10:50 UTC PAC: 12/11/2020 10:50 UTC
SL2	06.16 / 2.61	PAC: 15/01/2020 11:36 UTC

IPF	IPF / Processing Baseline version	Date of deployment
S3B		
SL1	06.17 / 1.50	PAC: 12/11/2020 10:50 UTC
SL2	06.16 / 1.33	PAC: 15/01/2020 11:36 UTC

Note that more details of the processing baseline version can be found in the SLSTR Product Notice.

	Sentinel-3 MPC S3 SLSTR Cyclic Performance Report S3A Cycle No. 069 – S3B Cycle No. 050	Ref.: S3MPC.RAL.PR.02-069-050 Issue: 1.0 Date: 08/04/2021 Page: 2
--	--	--

2 Instrument monitoring

2.1 Instrument temperatures

As a thermal infrared instrument, thermal stability and uniformity of the optical mechanical enclosure (OME) is critical to the radiometric calibration. Figure 1 and Figure 2 show the orbital average temperature of the OME and instrument baffles for SLSTR-A and SLSTR-B during the cycle. The temperatures were stable (on top of a daily variation cycle).

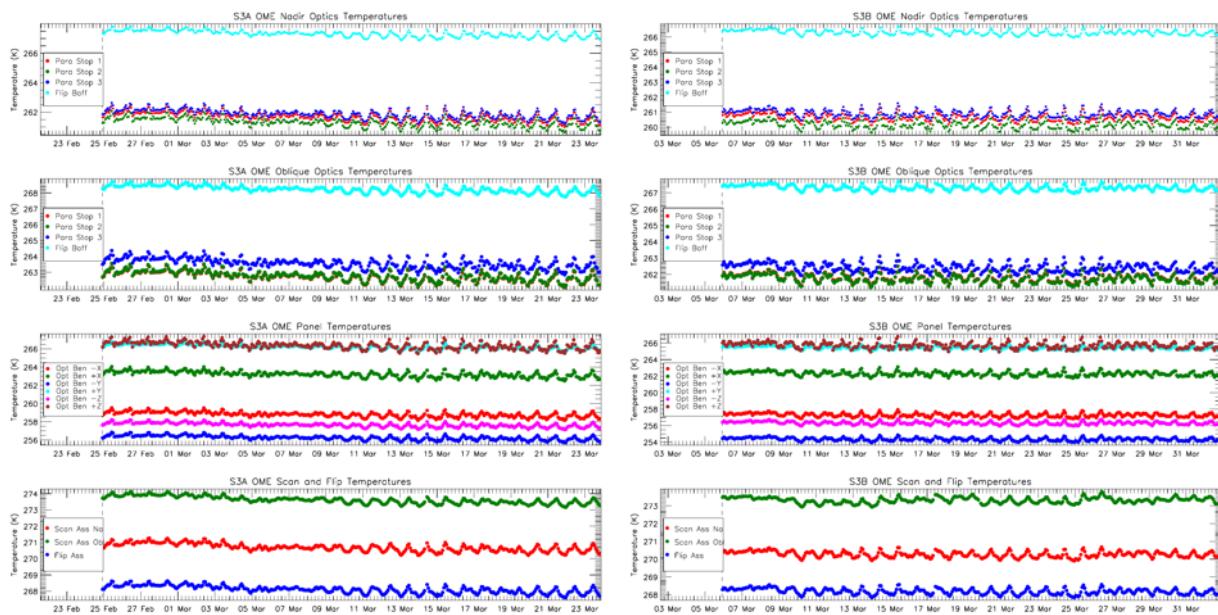


Figure 1: OME temperature trends for SLSTR-A Cycle 069 (left) and SLSTR-B Cycle 050 (right) showing the paraboloid stops and flip baffle (top two plots) and optical bench and scanner and flip assembly (lower two plots). The vertical dashed lines indicate the start and end of the cycle. Each dot represents the average temperature in one orbit.



Sentinel-3 MPC

S3 SLSTR Cyclic Performance Report

S3A Cycle No. 069 – S3B Cycle No. 050

Ref.: S3MPC.RAL.PR.02-069-050

Issue: 1.0

Date: 08/04/2021

Page: 3

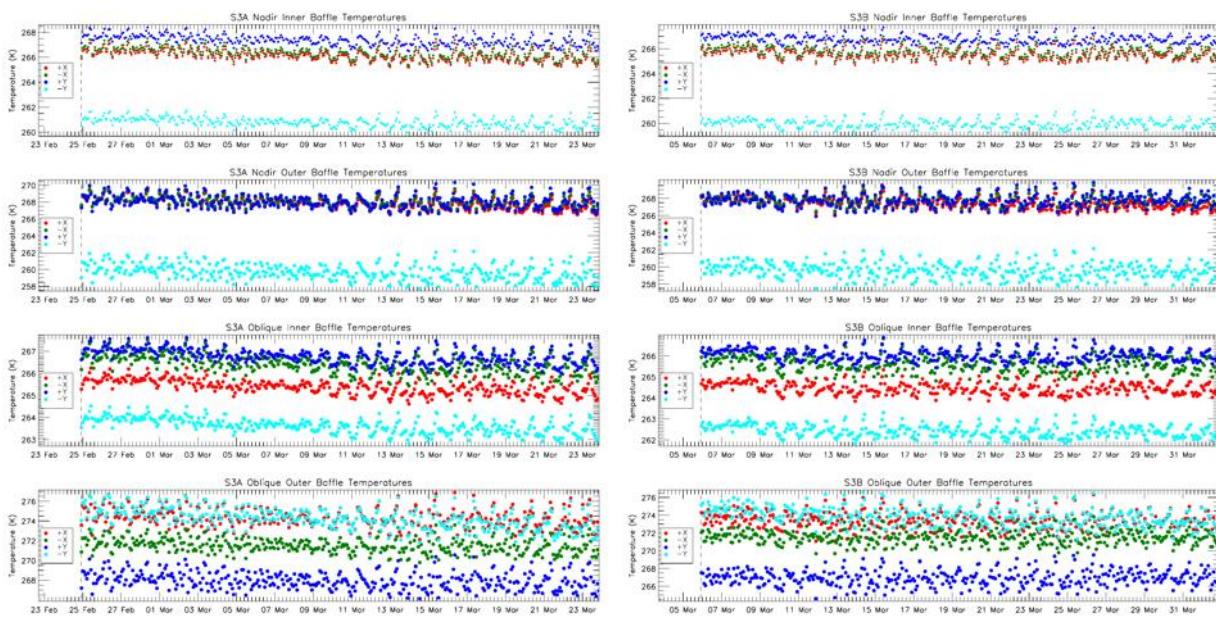


Figure 2: Baffle temperature trends for SLSTR-A Cycle 069 (left) and SLSTR-B Cycle 050 (right). The vertical dashed lines indicate the start and end of the cycle. Each dot represents the average temperature in one orbit.

	Sentinel-3 MPC S3 SLSTR Cyclic Performance Report S3A Cycle No. 069 – S3B Cycle No. 050	Ref.: S3MPC.RAL.PR.02-069-050 Issue: 1.0 Date: 08/04/2021 Page: 4
--	--	--

2.2 Detector temperatures

The detector temperatures for both SLSTR-A and SLSTR-B were stable at their expected values following the latest decontamination phases. Decontamination was last performed for SLSTR-A in Cycle 058 following the instrument anomaly on 13th May 2020. Decontamination was last performed for SLSTR-B in Cycle 45 from 11th to 13th November 2020. Decontamination involves warming up the infrared focal plane assembly (FPA) in order to remove water ice contamination from the cold surfaces. Figure 3 and Figure 4 show the SLSTR-A and SLSTR-B detector temperatures for the past year. The decontaminations are clearly visible as a rise in detector temperature.

A few orbits (e.g. Cycles 60, 63 and 67 for SLSTR-A) show slightly lower average visible channel detector temperatures due to instrument operations that were performed on those days.

The cooler cold tip temperature was adjusted for SLSTR-A on 14th October 2020 in Cycle 64. A similar adjustment was made for SLSTR-B in Cycle 37 on 30th March. This has the effect of increasing the detector temperatures for the SWIR and TIR channels, and appears as a step in Figure 3 and Figure 4. The lower limit of the dynamic range for SLSTR-A channel S8 was adjusted on 26th January to compensate for the change in detector temperatures carried out in October 2020.

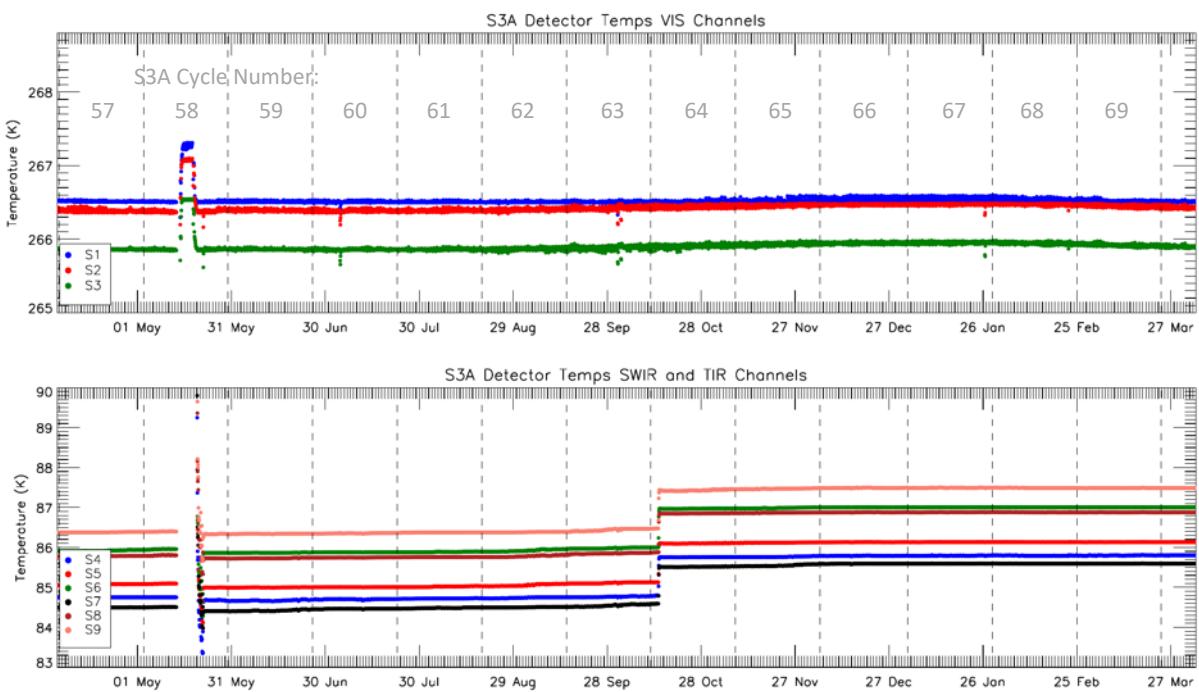


Figure 3: SLSTR-A detector temperatures for each channel for the last year of operations. Discontinuities occur for the infrared channels where the FPA was heated for decontamination. The vertical dashed lines indicate the start and end of each cycle. Each dot represents the average temperature in one orbit. The different colours indicate different detectors.

 <p>Sentinel-3 MPC</p> <p>S3 SLSTR Cyclic Performance Report</p> <p>S3A Cycle No. 069 – S3B Cycle No. 050</p>	Ref.: S3MPC.RAL.PR.02-069-050 Issue: 1.0 Date: 08/04/2021 Page: 5
--	--

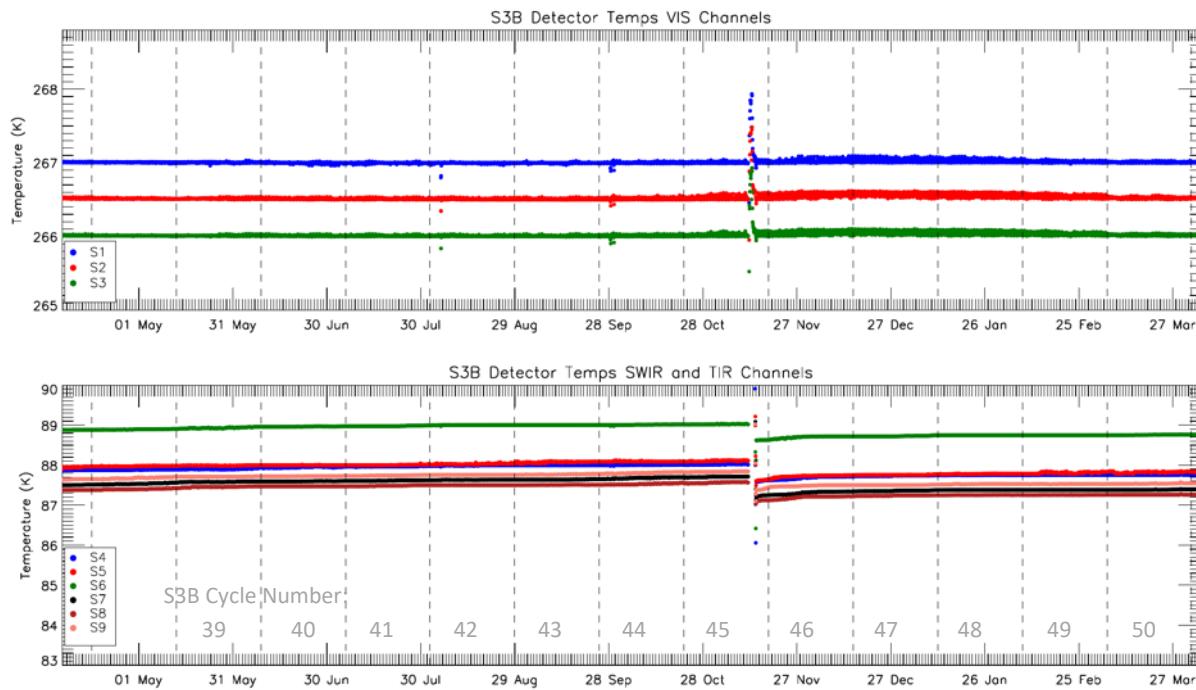


Figure 4: SLSTR-B detector temperatures for each channel for the last year of operations. Discontinuities occur for the infrared channels where the FPA was heated for decontamination. The vertical dashed lines indicate the start and end of each cycle. Each dot represents the average temperature in one orbit. The different colours indicate different detectors.



Sentinel-3 MPC

S3 SLSTR Cyclic Performance Report

S3A Cycle No. 069 – S3B Cycle No. 050

Ref.: S3MPC.RAL.PR.02-069-050

Issue: 1.0

Date: 08/04/2021

Page: 6

2.3 Scanner performance

The actual position of the scan and flip mirrors is measured by the instrument, and Figure 5 shows the statistics of the difference from the expected linear control law for each mirror in each view during SLSTR-A Cycle 069. Figure 6 shows the equivalent trends for SLSTR-B in Cycle 050. The performance has been consistent with previous operations and does not appear to be degrading. For reference, one arcsecond corresponds to roughly 4m on the ground.

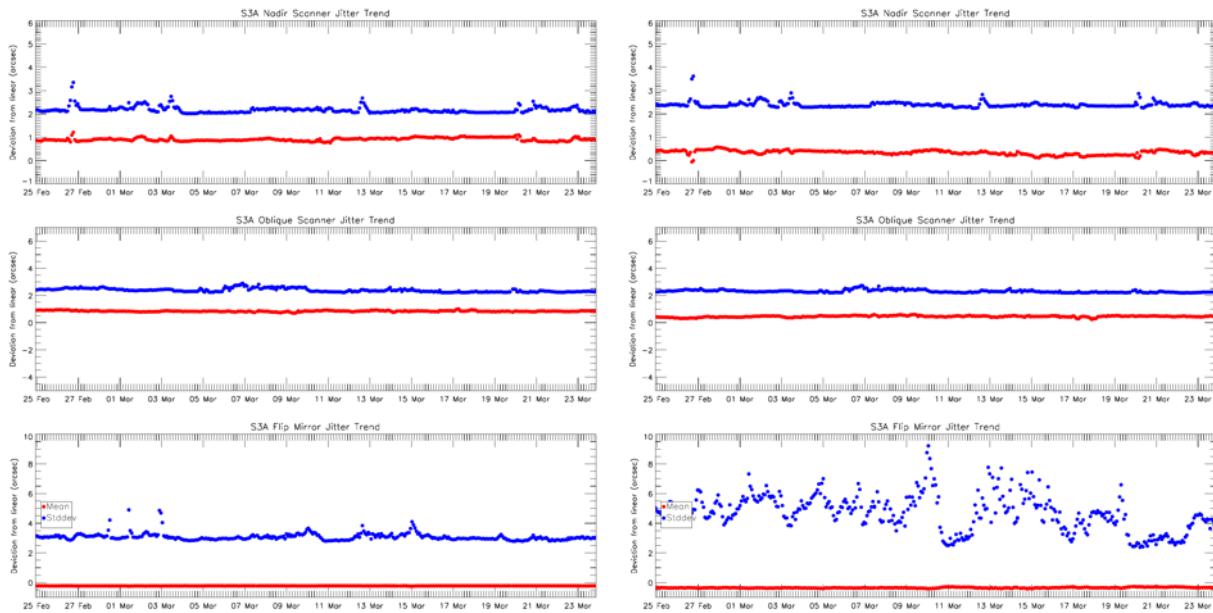


Figure 5: SLSTR-A scanner and flip jitter for Cycle 069, showing mean and stddev from expected position per orbit (red and blue respectively) for the nadir view (left) and oblique view (right). The plots show the nadir scanner (top), oblique scanner (middle) and flip mirror (bottom).



Sentinel-3 MPC

S3 SLSTR Cyclic Performance Report

S3A Cycle No. 069 – S3B Cycle No. 050

Ref.: S3MPC.RAL.PR.02-069-050

Issue: 1.0

Date: 08/04/2021

Page: 7

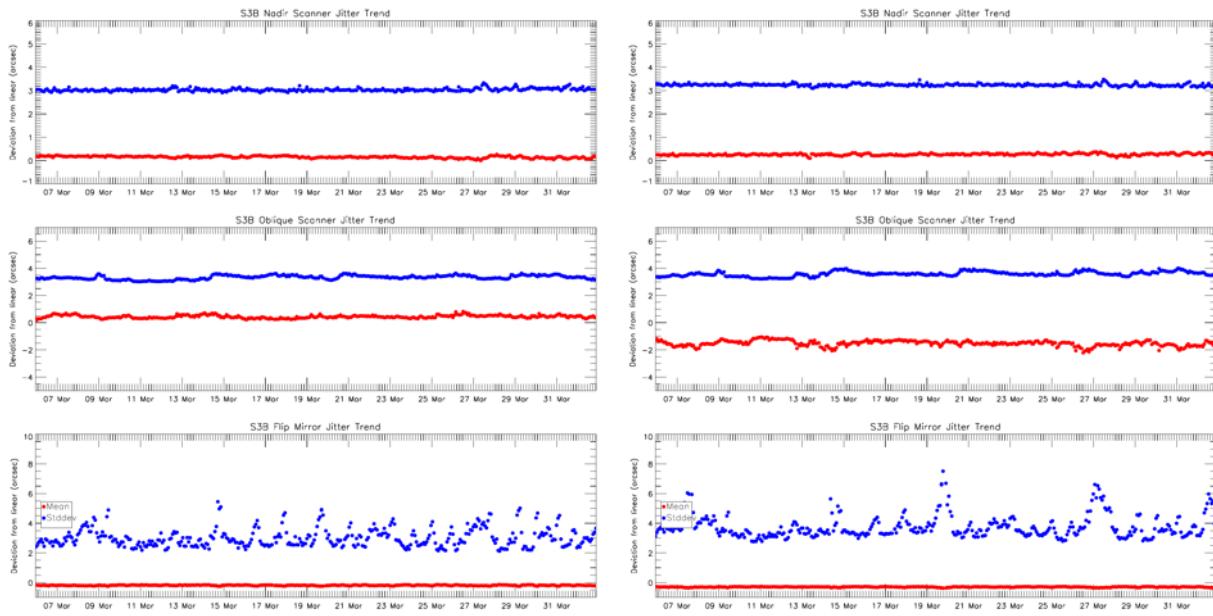


Figure 6: SLSTR-B scanner and flip jitter long term in Cycle 050, showing mean and stddev difference from expected position per orbit (red and blue respectively) for the nadir view (left) and oblique view (right). The plots show the nadir scanner (top), oblique scanner (middle) and flip mirror (bottom).



Sentinel-3 MPC
S3 SLSTR Cyclic Performance Report
S3A Cycle No. 069 – S3B Cycle No. 050

Ref.: S3MPC.RAL.PR.02-069-050
Issue: 1.0
Date: 08/04/2021
Page: 8

2.4 Black-Bodies

The orbital average blackbody temperatures for SLSTR-A are shown in Figure 7, and SLSTR-B are shown in Figure 9. The temperatures were stable on top of a daily variation cycle. There are also longer term cycle-to-cycle trends which show a yearly variation, with temperatures rising as the Earth approaches perihelion at the beginning of January (see Figure 8 and Table 5). Figure 7 and Figure 9 show the gradients across the blackbody baseplate (i.e. each PRT sensor reading relative to the mean). The gradients are stable and within their expected range of $\pm 20\text{mK}$, except for the +YBB for SLSTR-B which has a higher gradient. This higher gradient is expected and consistent with measurements made before launch.

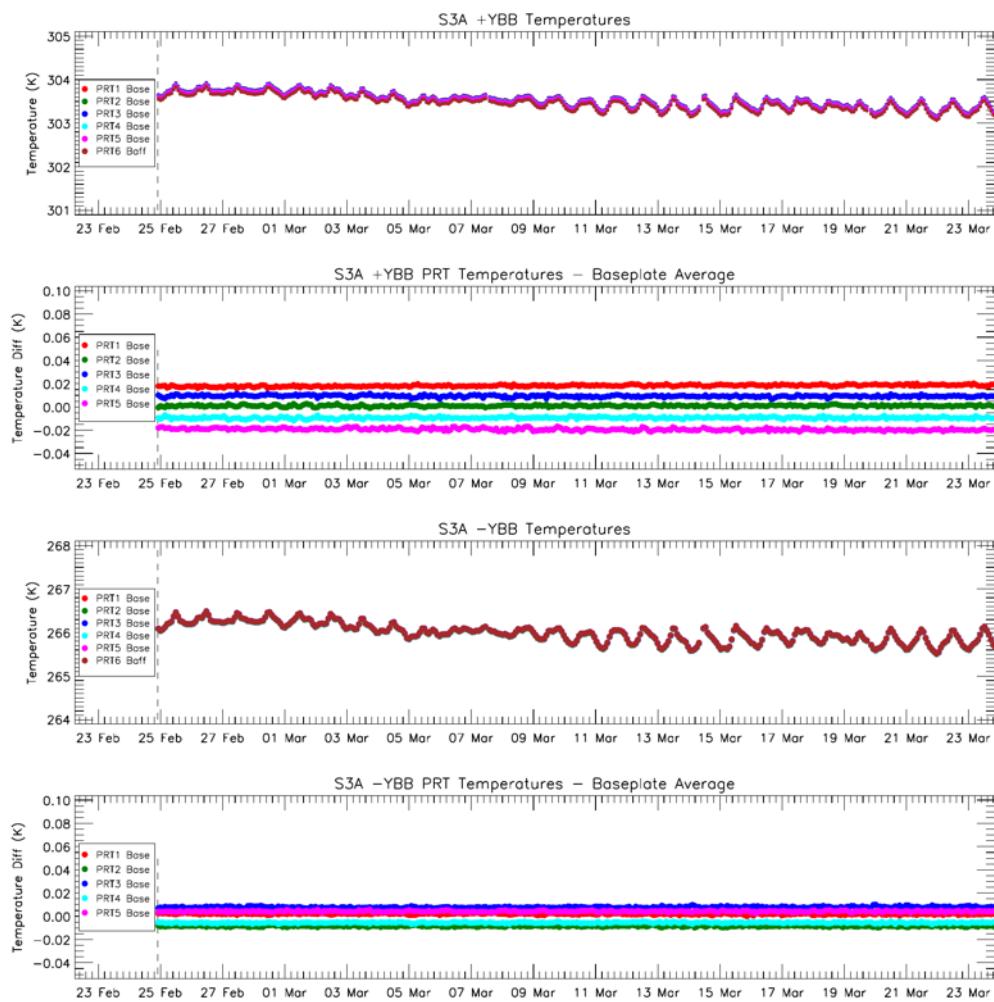


Figure 7: SLSTR-A blackbody temperature and baseplate gradient trends during Cycle 069. The vertical dashed lines indicate the start and end of the cycle. Each dot represents the average temperature in one orbit.



Sentinel-3 MPC

S3 SLSTR Cyclic Performance Report

S3A Cycle No. 069 – S3B Cycle No. 050

Ref.: S3MPC.RAL.PR.02-069-050

Issue: 1.0

Date: 08/04/2021

Page: 9

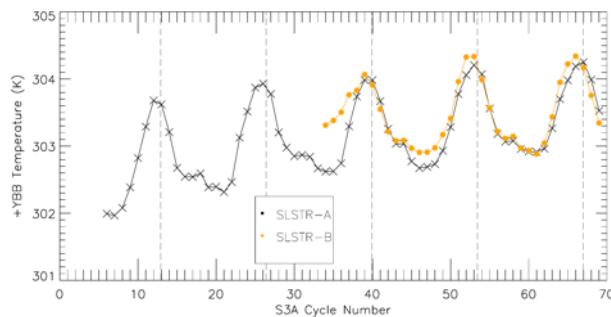


Figure 8: SLSTR-A and SLSTR-B long term trends in average +YBB temperature, showing yearly variation. The vertical dashed lines approximately indicate the 1st January 2017, 2018, 2019, 2020 and 2021.

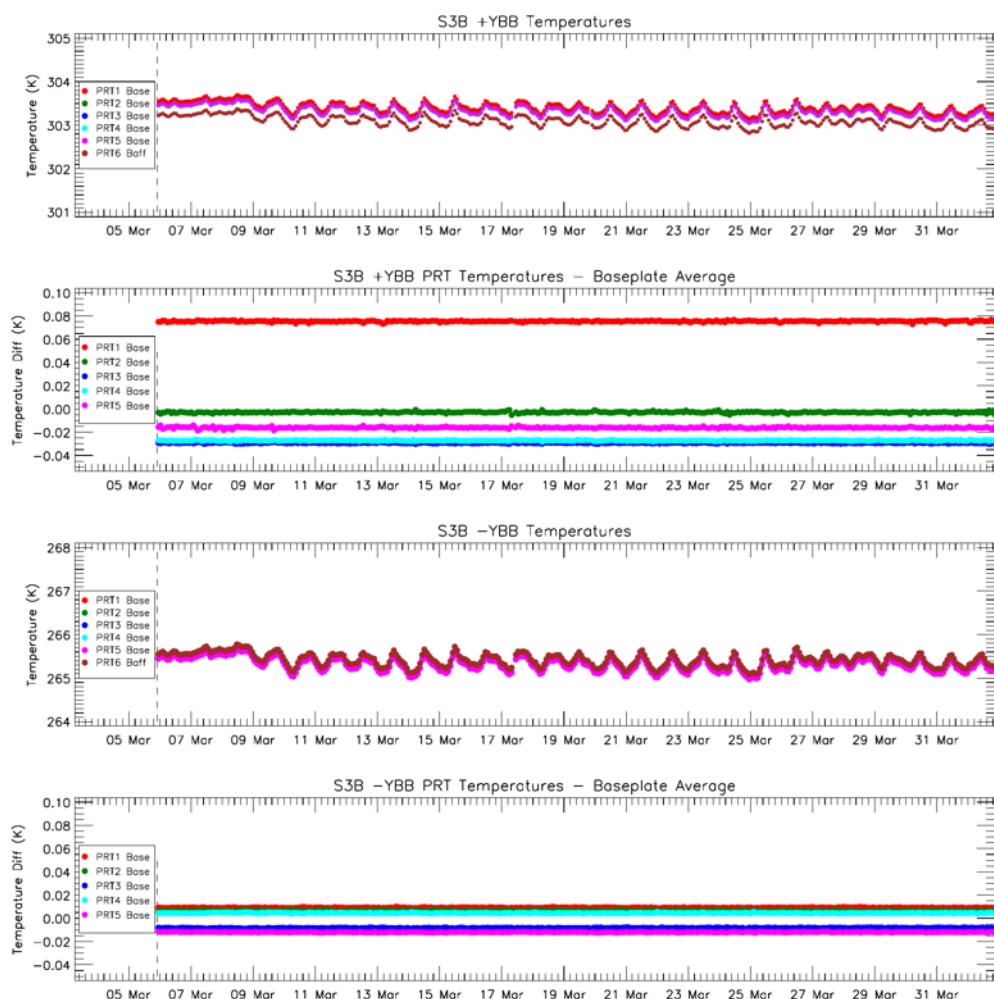


Figure 9: SLSTR-B blackbody temperature and baseplate gradient trends during Cycle 050. The vertical dashed lines indicate the start and end of the cycle. Each dot represents the average temperature in one orbit.

 Sentinel-3 MPC S3 SLSTR Cyclic Performance Report S3A Cycle No. 069 – S3B Cycle No. 050	Ref.: S3MPC.RAL.PR.02-069-050 Issue: 1.0 Date: 08/04/2021 Page: 10
--	---

2.5 Detector noise levels

2.5.1 SLSTR-A VIS and SWIR channel signal-to-noise

The VIS and SWIR channel noise for SLSTR-A in Cycle 069 was stable and consistent with previous operations - the signal-to-noise ratio of the measured VISCAL signal over the past year is plotted in Figure 10. Table 1 and Table 2 give the average signal-to-noise in each cycle (excluding the instrument decontaminations). These values average over the significant detector-detector dispersion for the SWIR channels that is shown in Figure 10.

Table 1: Average SLSTR-A reflectance factor, and signal-to-noise ratio of the measured VISCAL signal for the last 11 cycles, averaged over all detectors for the nadir view.

	Average Reflectance Factor	Nadir Signal-to-noise ratio											
		Cycle 059	Cycle 060	Cycle 061	Cycle 062	Cycle 063	Cycle 064	Cycle 065	Cycle 066	Cycle 067	Cycle 068	Cycle 069	
S1	0.187	236	242	239	238	246	246	241	241	246	244	238	
S2	0.194	239	240	243	242	243	246	250	246	246	246	245	
S3	0.190	225	225	229	231	231	232	230	231	234	236	232	
S4	0.191	165	164	166	169	170	175	176	176	177	176	175	
S5	0.193	281	279	279	282	284	287	288	288	292	291	286	
S6	0.175	177	178	178	181	184	186	188	189	190	188	186	

Table 2: Average SLSTR-A reflectance factor, and signal-to-noise ratio of the measured VISCAL signal for the last 11 cycles, averaged over all detectors for the oblique view.

	Average Reflectance Factor	Oblique Signal-to-noise ratio											
		Cycle 059	Cycle 060	Cycle 061	Cycle 062	Cycle 063	Cycle 064	Cycle 065	Cycle 066	Cycle 067	Cycle 068	Cycle 069	
S1	0.166	245	258	255	253	262	268	265	264	269	269	263	
S2	0.170	249	256	261	261	260	265	272	273	269	264	265	
S3	0.168	226	227	233	241	241	241	240	241	241	243	243	
S4	0.166	133	135	137	138	139	140	141	142	141	139	140	
S5	0.166	210	213	211	216	214	215	218	215	210	209	212	
S6	0.155	130	130	131	133	133	135	137	136	134	131	133	



Sentinel-3 MPC

S3 SLSTR Cyclic Performance Report

S3A Cycle No. 069 – S3B Cycle No. 050

Ref.: S3MPC.RAL.PR.02-069-050

Issue: 1.0

Date: 08/04/2021

Page: 11

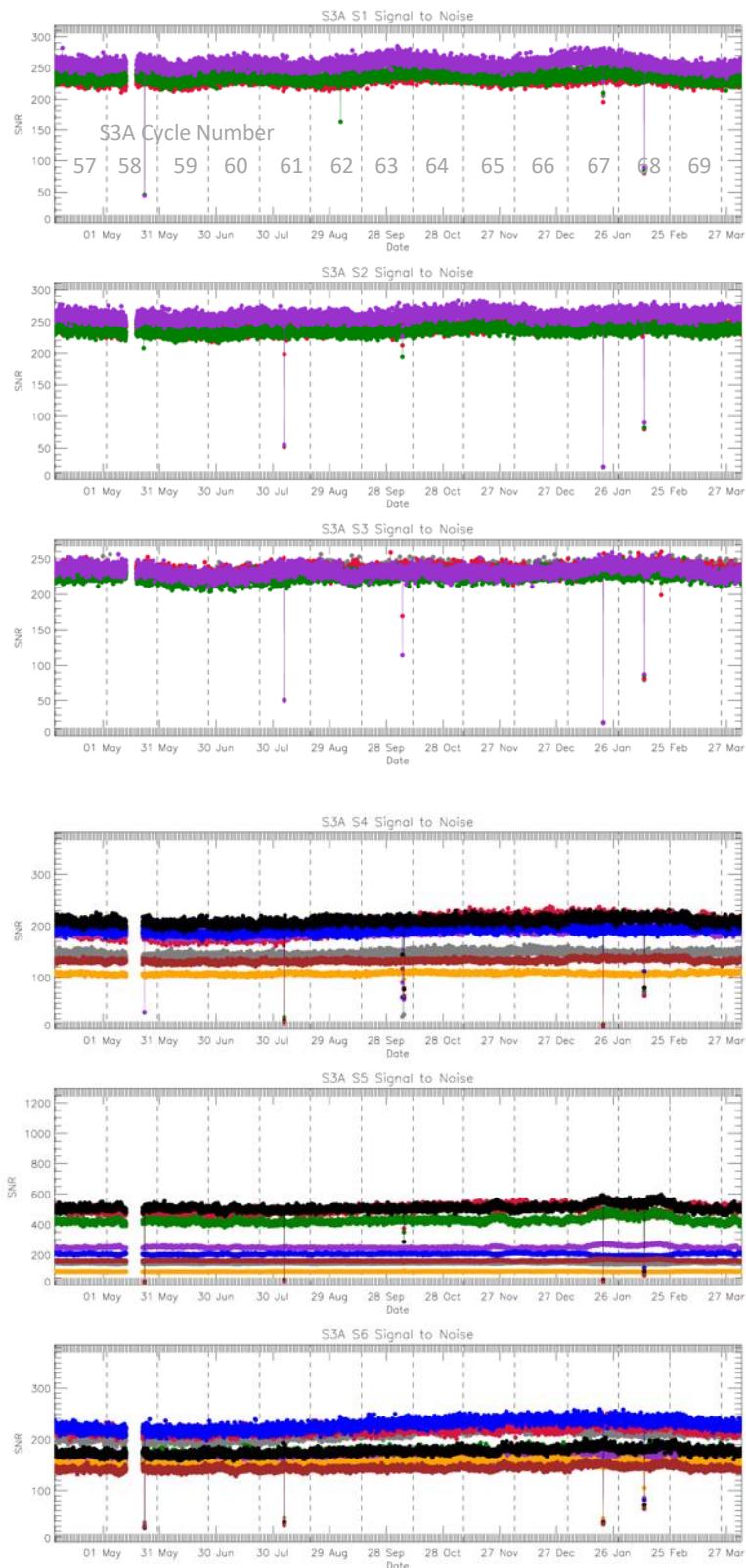


Figure 10: VIS and SWIR channel signal-to-noise of the measured VISCAL signal in each orbit for the last year of operations for SLSTR-A. Different colours indicate different detectors. The vertical dashed lines indicate the start and end of each cycle.

 Sentinel-3 MPC S3 SLSTR Cyclic Performance Report S3A Cycle No. 069 – S3B Cycle No. 050	Ref.: S3MPC.RAL.PR.02-069-050 Issue: 1.0 Date: 08/04/2021 Page: 12
--	---

2.5.2 SLSTR-B VIS and SWIR channel signal-to-noise

The average VIS and SWIR channel signal-to-noise ratios for SLSTR-B in Cycle 050 are shown in Table 3 and Table 4. These values average over a significant detector-detector dispersion for the SWIR channels.

Table 3: Average SLSTR-B reflectance factor, and signal-to-noise ratio of the measured VISCAL signal for the last 11 cycles, averaged over all detectors for the nadir view.

	Average Reflectance Factor	Nadir Signal-to-noise ratio											
		Cycle 040	Cycle 041	Cycle 042	Cycle 043	Cycle 044	Cycle 045	Cycle 046	Cycle 047	Cycle 048	Cycle 049	Cycle 050	
S1	0.177	224	224	228	228	230	233	232	232	236	231	234	
S2	0.192	214	218	219	219	222	221	222	223	224	224	218	
S3	0.194	223	225	221	227	233	228	229	233	234	227	228	
S4	0.186	129	129	130	131	131	130	132	132	131	130	129	
S5	0.184	240	239	241	241	241	244	246	246	244	244	244	
S6	0.162	159	159	162	160	159	162	165	166	167	165	162	

Table 4: Average SLSTR-B reflectance factor, and signal-to-noise ratio of the measured VISCAL signal for the last 11 cycles, averaged over all detectors for the oblique view.

	Average Reflectance Factor	Oblique Signal-to-noise ratio											
		Cycle 040	Cycle 041	Cycle 042	Cycle 043	Cycle 044	Cycle 045	Cycle 046	Cycle 047	Cycle 048	Cycle 049	Cycle 050	
S1	0.157	216	216	218	220	223	224	229	227	227	225	224	
S2	0.168	241	247	246	251	255	255	260	260	260	258	254	
S3	0.172	254	250	251	259	257	259	262	269	260	257	261	
S4	0.168	125	127	127	127	128	128	130	132	129	128	128	
S5	0.172	242	242	242	242	241	244	248	249	247	247	247	
S6	0.152	178	179	181	183	184	185	188	188	186	185	186	

 Sentinel-3 MPC S3 SLSTR Cyclic Performance Report S3A Cycle No. 069 – S3B Cycle No. 050	Ref.: S3MPC.RAL.PR.02-069-050 Issue: 1.0 Date: 08/04/2021 Page: 13
--	---

2.5.3 SLSTR-A TIR channel NEDT

The thermal channel NEDT values for SLSTR-A in Cycle 069 are consistent with previous operations and within the requirements. NEDT trends calculated from the hot and cold blackbody signals are shown in Figure 11. NEDT values for each cycle, averaged over all detectors and both Earth views, are shown in Table 5.

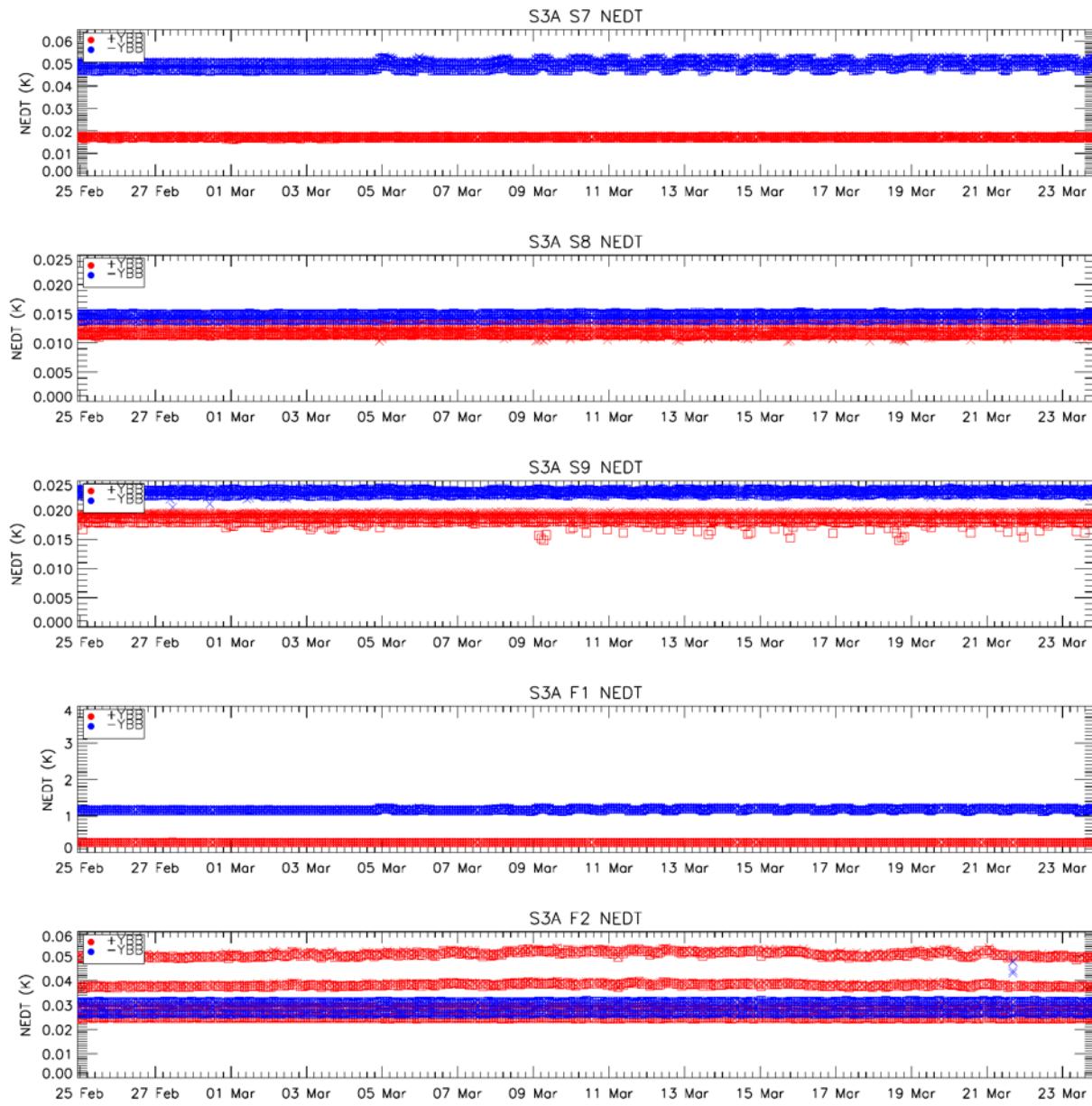


Figure 11: SLSTR-A NEDT trend for the thermal channels in Cycle 069. Blue points were calculated from the cold blackbody signal and red points from the hot blackbody. The square symbols show results calculated from the nadir view and crosses show results from the oblique view. Results are plotted for all detectors and integrators, which is why there are several different levels within the same colour points (particularly for S8 and F2).

 Sentinel-3 MPC S3 SLSTR Cyclic Performance Report S3A Cycle No. 069 – S3B Cycle No. 050	Ref.: S3MPC.RAL.PR.02-069-050 Issue: 1.0 Date: 08/04/2021 Page: 14
--	---

Table 5: NEDT for SLSTR-A in the last 11 cycles averaged over all detectors for both Earth views towards the hot +YBB (top) and the cold -YBB (bottom).

SLSTR-A	Cycle 059	Cycle 060	Cycle 061	Cycle 062	Cycle 063	Cycle 064	Cycle 065	Cycle 066	Cycle 067	Cycle 068	Cycle 069
+YBB temp (K)	302.957	302.920	302.914	302.962	303.265	303.700	303.981	304.190	304.250	303.989	303.526
NEDT (mK)	S7	17.3	17.4	17.4	17.3	17.9	17.2	16.9	16.9	17.0	17.3
	S8	11.3	11.4	11.5	11.4	11.6	11.8	11.9	11.8	11.9	11.9
	S9	17.5	17.5	17.6	17.6	17.8	18.5	18.6	18.6	18.7	18.7
	F1	274	277	277	274	342	271	267	266	267	273
	F2	35.3	35.0	35.1	36.0	35.1	35.2	35.4	35.5	35.4	35.7

SLSTR-A	Cycle 059	Cycle 060	Cycle 061	Cycle 062	Cycle 063	Cycle 064	Cycle 065	Cycle 066	Cycle 067	Cycle 068	Cycle 069
-YBB temp (K)	265.645	265.545	265.438	265.401	265.731	266.335	266.751	266.930	266.930	266.552	265.985
NEDT (mK)	S7	49.5	49.4	49.5	49.6	48.0	48.7	47.6	47.0	47.1	48.7
	S8	14.1	14.1	14.1	14.1	14.2	14.6	14.7	14.5	14.6	14.7
	S9	21.5	21.6	21.7	21.7	21.6	22.7	22.8	22.8	22.8	23.0
	F1	1197	1205	1204	1206	1173	1150	1128	1118	1128	1165
	F2	27.8	27.8	27.8	27.9	28.2	28.8	28.9	28.9	28.9	29.0

	Sentinel-3 MPC S3 SLSTR Cyclic Performance Report S3A Cycle No. 069 – S3B Cycle No. 050	Ref.: S3MPC.RAL.PR.02-069-050 Issue: 1.0 Date: 08/04/2021 Page: 15
--	--	---

2.5.4 SLSTR-B TIR channel NEDT

The thermal channel NEDT values for SLSTR-B in Cycle 050, calculated from the hot and cold blackbody signals are shown in Figure 12 and Table 6.

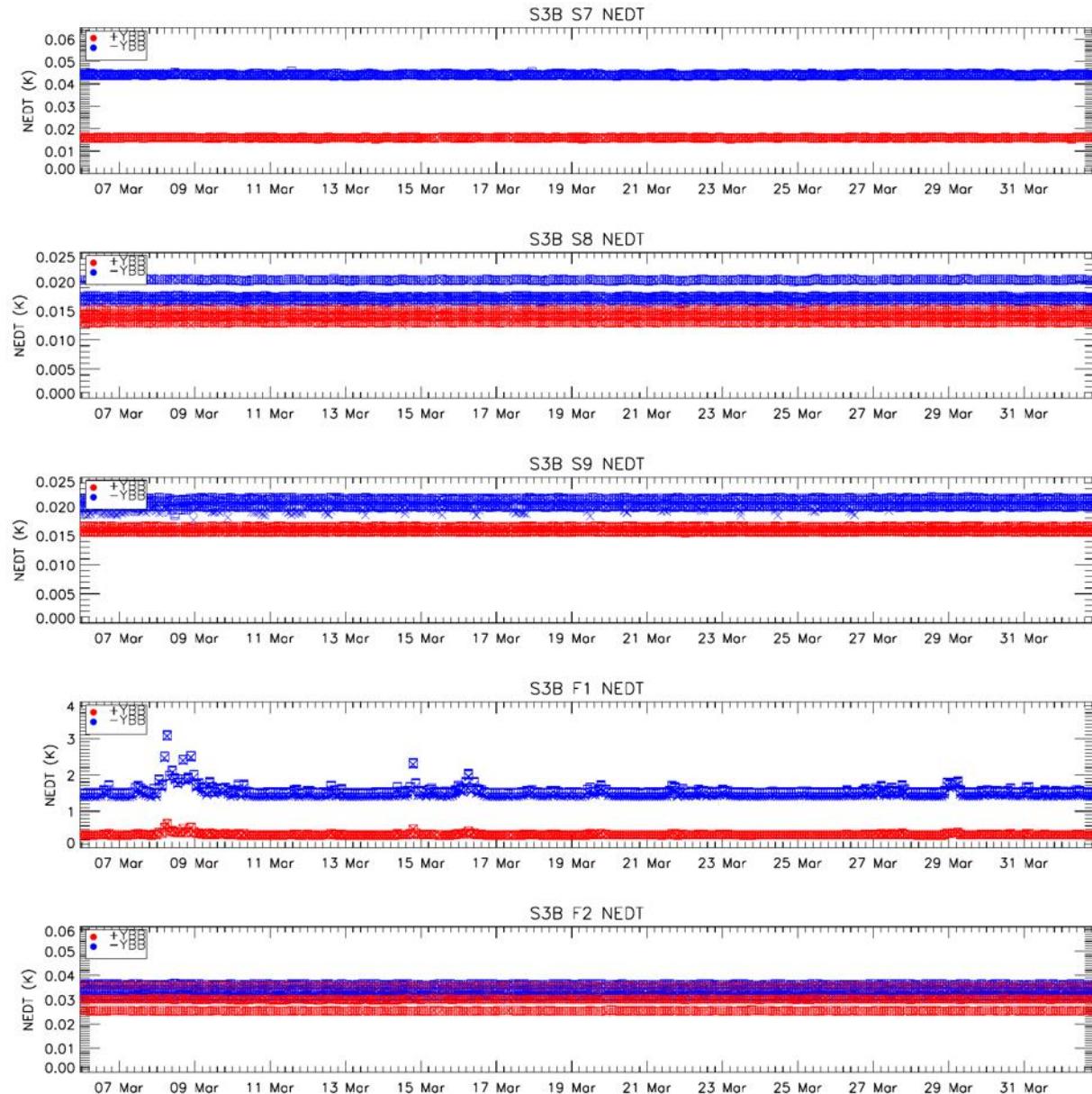


Figure 12: SLSTR-B NEDT trend for the thermal channels in Cycle 050. Blue points were calculated from the cold blackbody signal and red points from the hot blackbody. The square symbols show results calculated from the nadir view and crosses show results from the oblique view. Results are plotted for all detectors and integrators, which is why there are several different levels within the same colour points (particularly for S8 and F2).

 Sentinel-3 MPC S3 SLSTR Cyclic Performance Report S3A Cycle No. 069 – S3B Cycle No. 050	Ref.: S3MPC.RAL.PR.02-069-050 Issue: 1.0 Date: 08/04/2021 Page: 16
--	---

Table 6: NEDT for SLSTR-B in the last 11 cycles averaged over all detectors for both Earth views towards the hot +YBB (top) and the cold -YBB (bottom).

SLSTR-B	Cycle 040	Cycle 041	Cycle 042	Cycle 043	Cycle 044	Cycle 045	Cycle 046	Cycle 047	Cycle 048	Cycle 049	Cycle 050
+YBB temp (K)	302.971	302.930	302.882	303.045	303.435	303.951	304.224	304.339	304.168	303.756	303.344
NEDT (mK)	S7	16.2	16.3	16.3	16.2	16.7	16.0	15.8	15.8	16.1	16.0
	S8	14.5	14.5	14.5	14.5	14.6	14.3	13.8	13.8	13.9	14.0
	S9	16.6	16.7	16.8	16.9	17.0	16.6	15.7	15.8	15.9	16.0
	F1	442	406	435	466	481	410	396	404	339	358
	F2	30.5	30.5	30.4	30.3	30.5	30.6	30.7	30.9	30.7	30.4

SLSTR-B	Cycle 040	Cycle 041	Cycle 042	Cycle 043	Cycle 044	Cycle 045	Cycle 046	Cycle 047	Cycle 048	Cycle 049	Cycle 050
-YBB temp (K)	265.224	265.105	264.952	265.097	265.506	266.184	266.547	266.643	266.357	265.806	265.332
NEDT (mK)	S7	44.0	44.2	44.8	44.5	42.8	42.9	42.5	42.5	42.5	43.7
	S8	18.2	18.2	18.3	18.4	18.2	18.2	17.8	17.9	17.9	17.9
	S9	21.3	21.5	21.6	21.7	21.5	21.4	20.0	20.1	20.3	20.4
	F1	1875	1687	1844	2002	1871	1696	1667	1717	1396	1480
	F2	33.6	33.8	34.1	34.2	34.1	33.8	32.9	33.0	33.1	33.2

	Sentinel-3 MPC S3 SLSTR Cyclic Performance Report S3A Cycle No. 069 – S3B Cycle No. 050	Ref.: S3MPC.RAL.PR.02-069-050 Issue: 1.0 Date: 08/04/2021 Page: 17
--	--	---

2.6 Calibration factors

2.6.1 VIS and SWIR radiometric response

The visible channels show oscillations in their radiometric response due to the build-up of ice on the optical path within the focal plane assembly (FPA). Similar oscillations were observed for the corresponding channels on ATSR-2 and AATSR. As described in Section 2.2, periodic decontamination of the infrared FPA is necessary to remove the water ice contamination.

The radiometric responses of the SWIR channels appear to be more stable and not affected by the build-up of water ice contamination, although there is a seasonal cycle of the response that could be caused by variations in the solar zenith angle on the diffuser or partial vignetting of the Sun's disc by the VISCAL baffle.

It should be noted that the data from the VISCAL unit and blackbodies calibrates the signal and counteracts the degradation of the optics and other variations in signal.

Figure 13 and Figure 14 show the variation of the radiometric gain derived from the VISCAL signals for SLSTR-A over the past year, and Figure 15 and Figure 16 show the variation of the radiometric gain for SLSTR-B since the start of the S3B mission. Note that the period of the oscillations depends on the rate of build up of the ice layer, which is faster for SLSTR-B because it has had less time to decontaminate.

Note that decontaminations for SLSTR-A were performed in Cycles 45 and 54 and 58. For SLSTR-B, decontaminations were performed during Cycle 30 and Cycle 45.

There is a step in the SWIR channel radiometric response for SLSTR-B in Cycle 37 and in Cycle 64 for SLSTR-A due to the change in temperature of the detectors caused by the cooler set point change.

 Sentinel-3 MPC S3 SLSTR Cyclic Performance Report S3A Cycle No. 069 – S3B Cycle No. 050	Ref.: S3MPC.RAL.PR.02-069-050 Issue: 1.0 Date: 08/04/2021 Page: 18
--	---

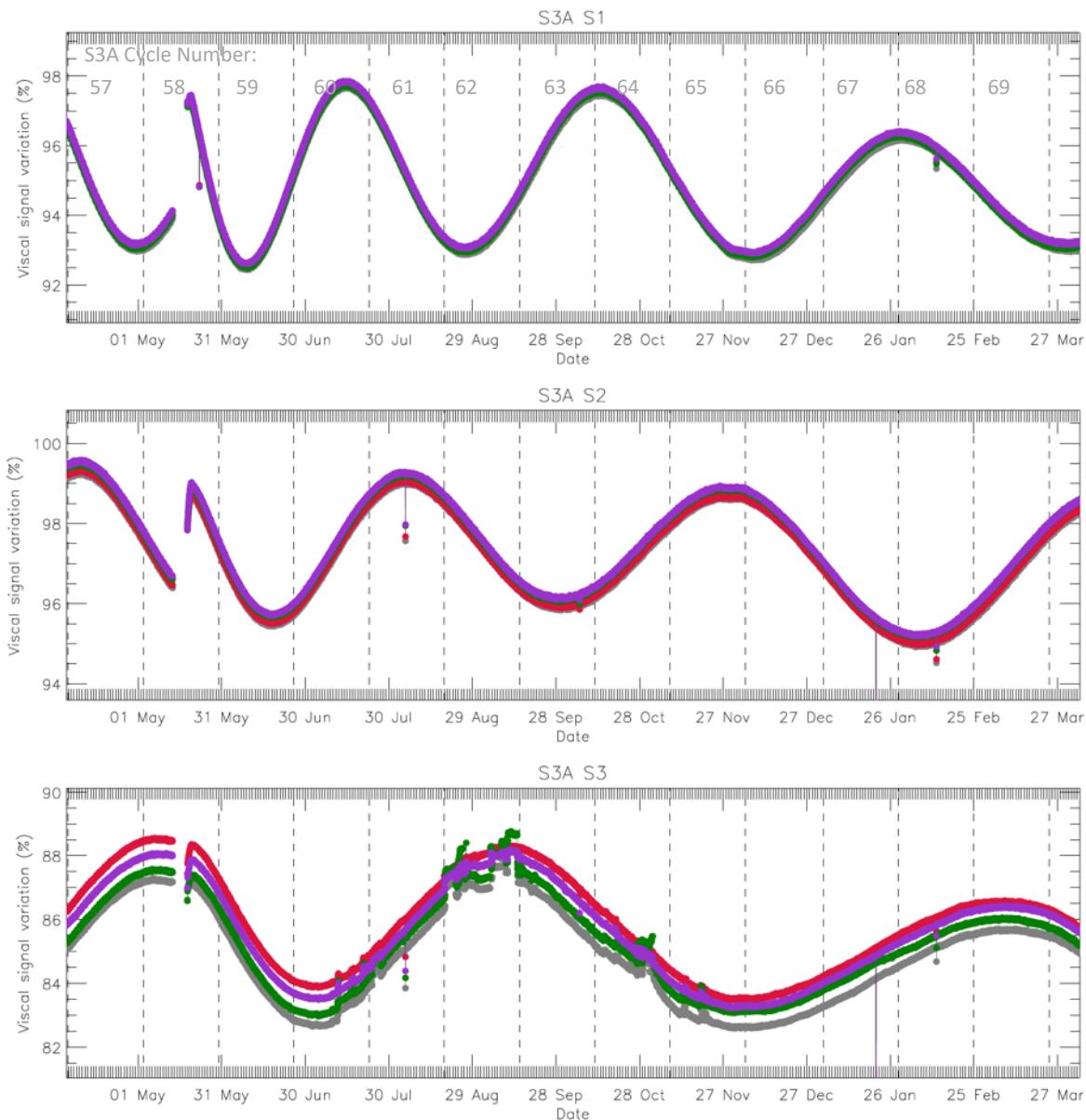


Figure 13: Variation of the radiometric gain derived from the VISCAL signals for SLSTR-A VIS channels for the last year of operations (nadir view). Different colours represent different detectors. The vertical dashed lines indicate the start and end of each cycle.

 Sentinel-3 MPC S3 SLSTR Cyclic Performance Report S3A Cycle No. 069 – S3B Cycle No. 050	Ref.: S3MPC.RAL.PR.02-069-050 Issue: 1.0 Date: 08/04/2021 Page: 19
--	---

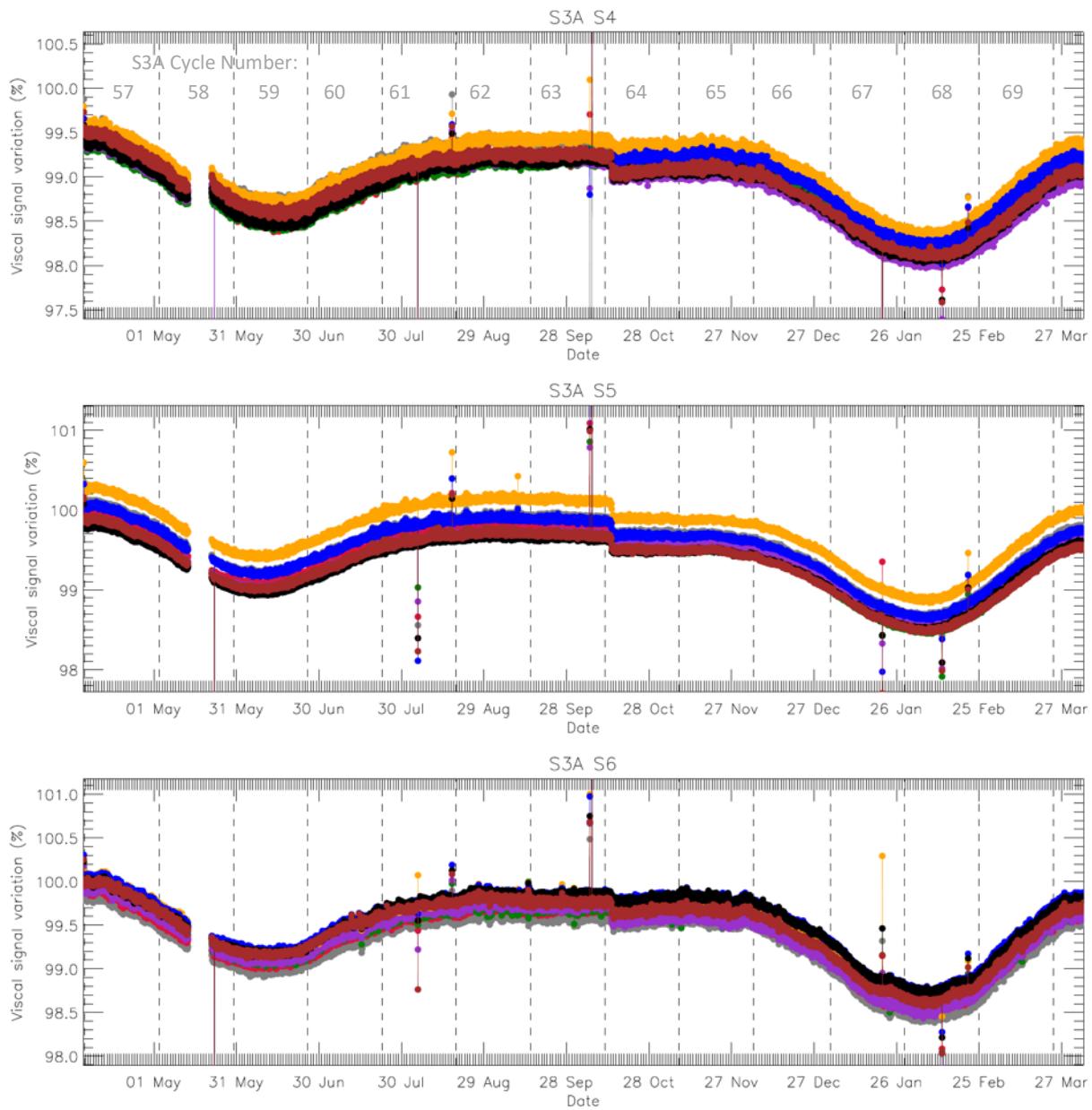


Figure 14: Variation of the radiometric gain derived from the VISCAL signals for SLSTR-A SWIR channels for the last year of operations (nadir view). Different colours represent different detectors. The vertical dashed lines indicate the start and end of each cycle.

 Sentinel-3 MPC S3 SLSTR Cyclic Performance Report S3A Cycle No. 069 – S3B Cycle No. 050	Ref.: S3MPC.RAL.PR.02-069-050 Issue: 1.0 Date: 08/04/2021 Page: 20
--	---

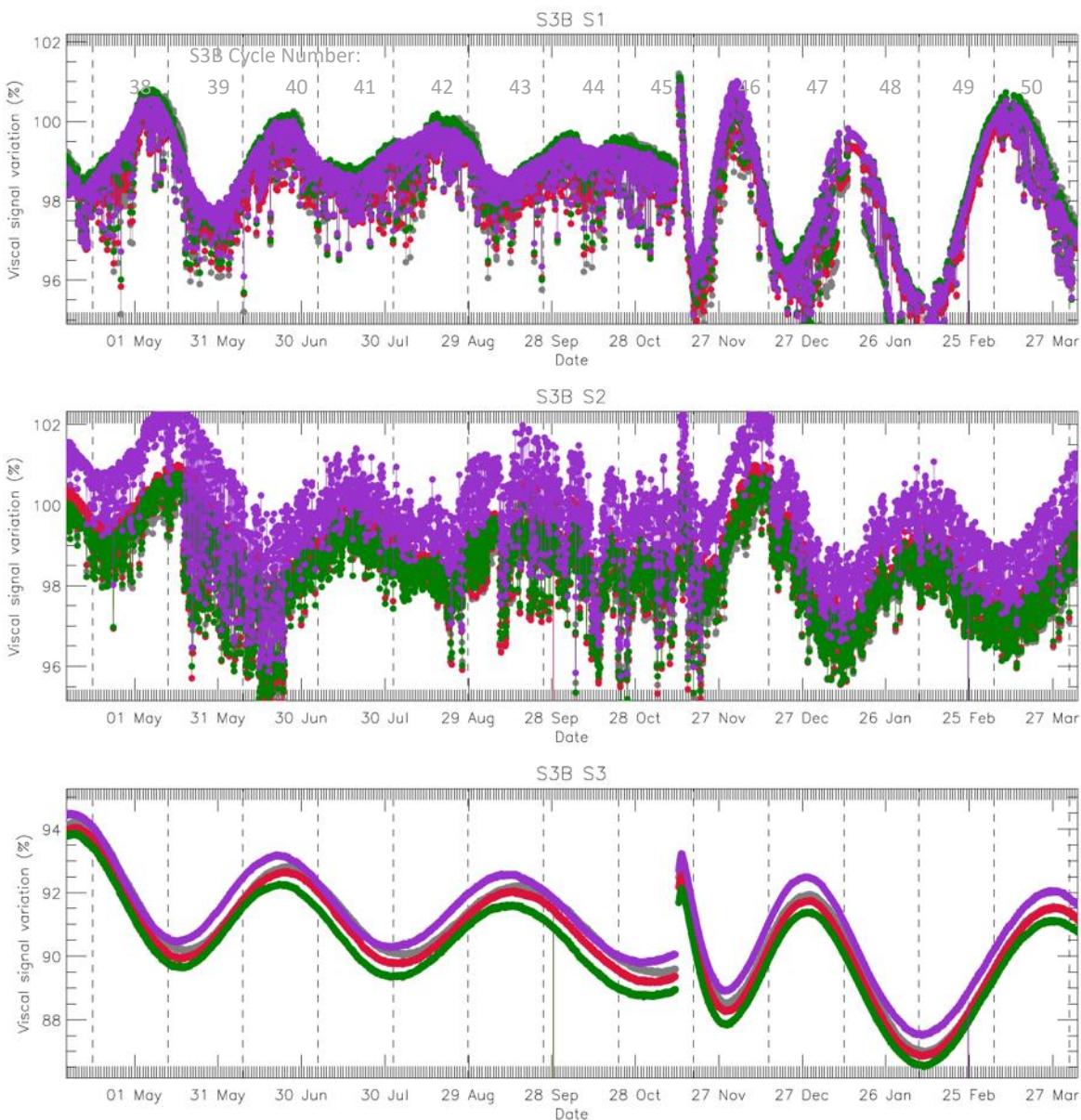


Figure 15: Variation of the radiometric gain derived from the VISCAL signals for SLSTR-B VIS channels for the past year (nadir view). Different colours represent different detectors. The vertical dashed lines indicate the start and end of each cycle.

 Sentinel-3 MPC S3 SLSTR Cyclic Performance Report S3A Cycle No. 069 – S3B Cycle No. 050	Ref.: S3MPC.RAL.PR.02-069-050 Issue: 1.0 Date: 08/04/2021 Page: 21
--	---

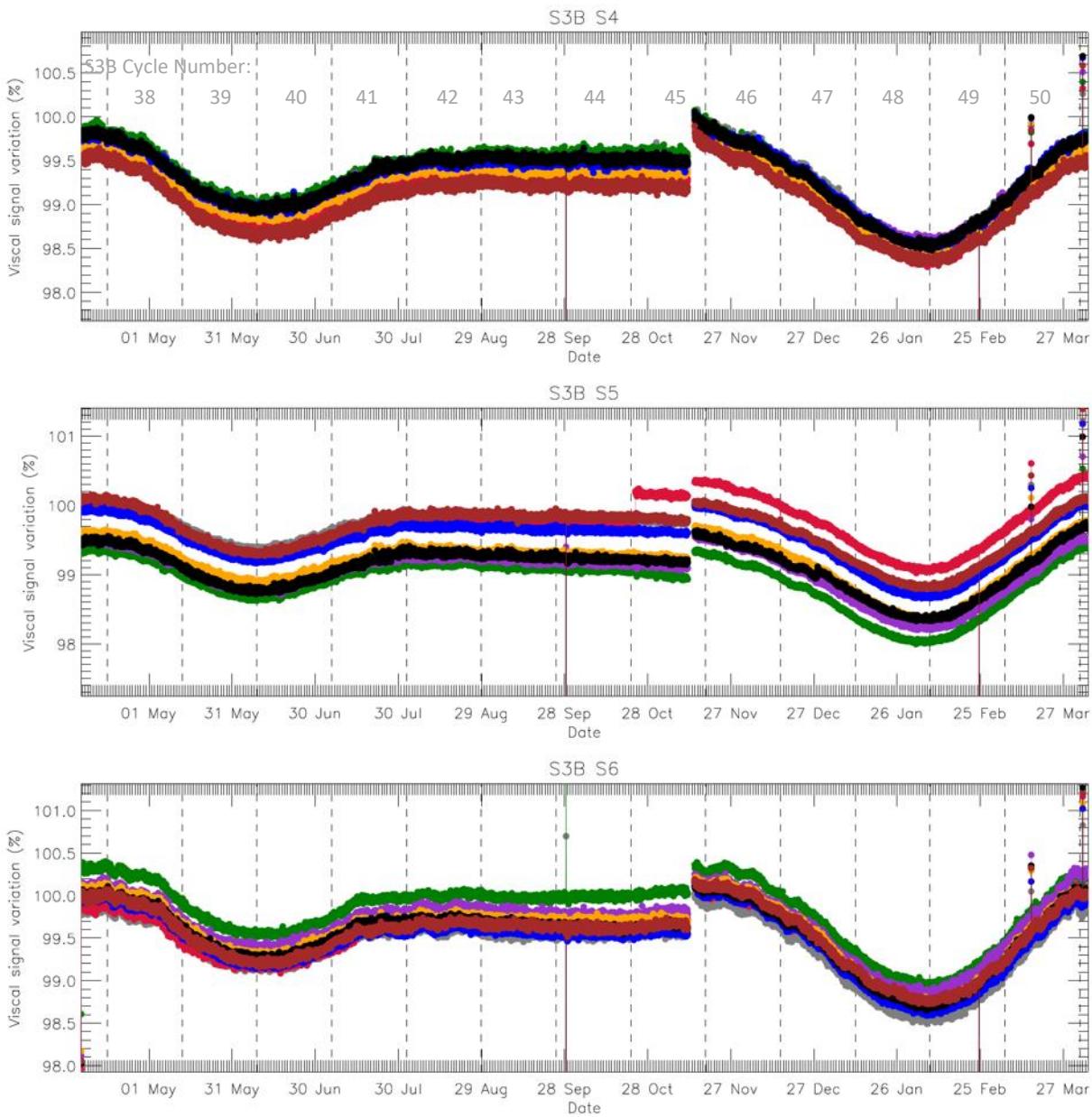


Figure 16: Variation of the radiometric gain derived from the VISCAL signals for SLSTR-B SWIR channels for the past year (nadir view). Different colours represent different detectors. The vertical dashed lines indicate the start and end of each cycle.



3 Level-1 product validation

3.1 Geometric calibration/validation

Regular monitoring using the GeoCal Tool implemented at the MPC is being carried out. This monitors the geolocation performance in Level-1 images by correlation with ground control point (GCP) imagettes. Each Level-1 granule typically contains several hundred GCPs, which are filtered based on signal-to-noise to obtain a daily average in the across and along track directions. The results are plotted in Figure 17 for SLSTR-A in Cycle 069 and Figure 18 for SLSTR-B in Cycle 050, giving the average positional offsets in kilometres for Nadir and Oblique views.

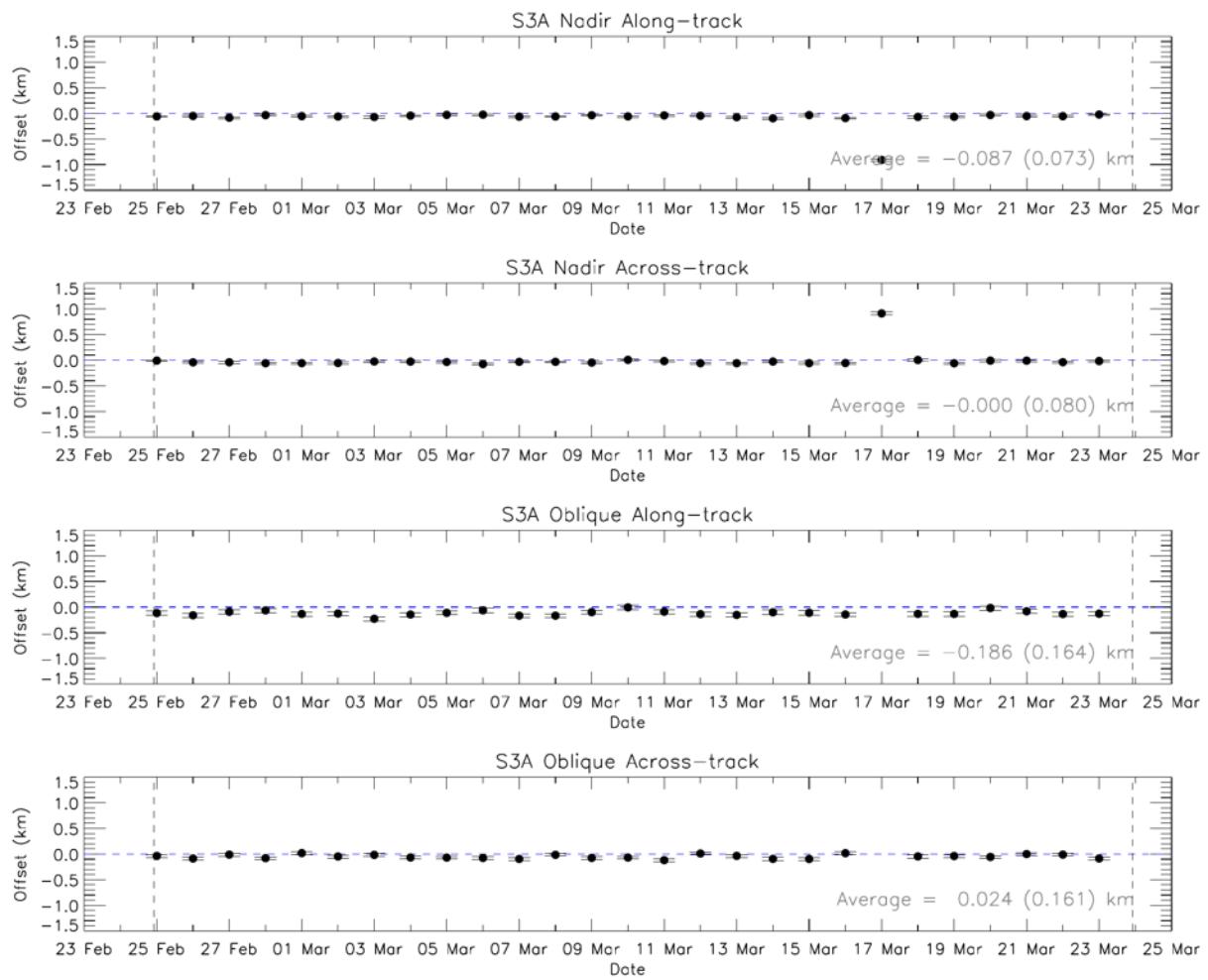


Figure 17: SLSTR-A daily offset results in km from the GeoCal Tool analysis for Nadir along- and across-track (top two plots) and Oblique along- and across-track (bottom two plots) for Cycle 069. The error bars show the standard deviation.

	Sentinel-3 MPC S3 SLSTR Cyclic Performance Report S3A Cycle No. 069 – S3B Cycle No. 050	Ref.: S3MPC.RAL.PR.02-069-050 Issue: 1.0 Date: 08/04/2021 Page: 23
--	--	---

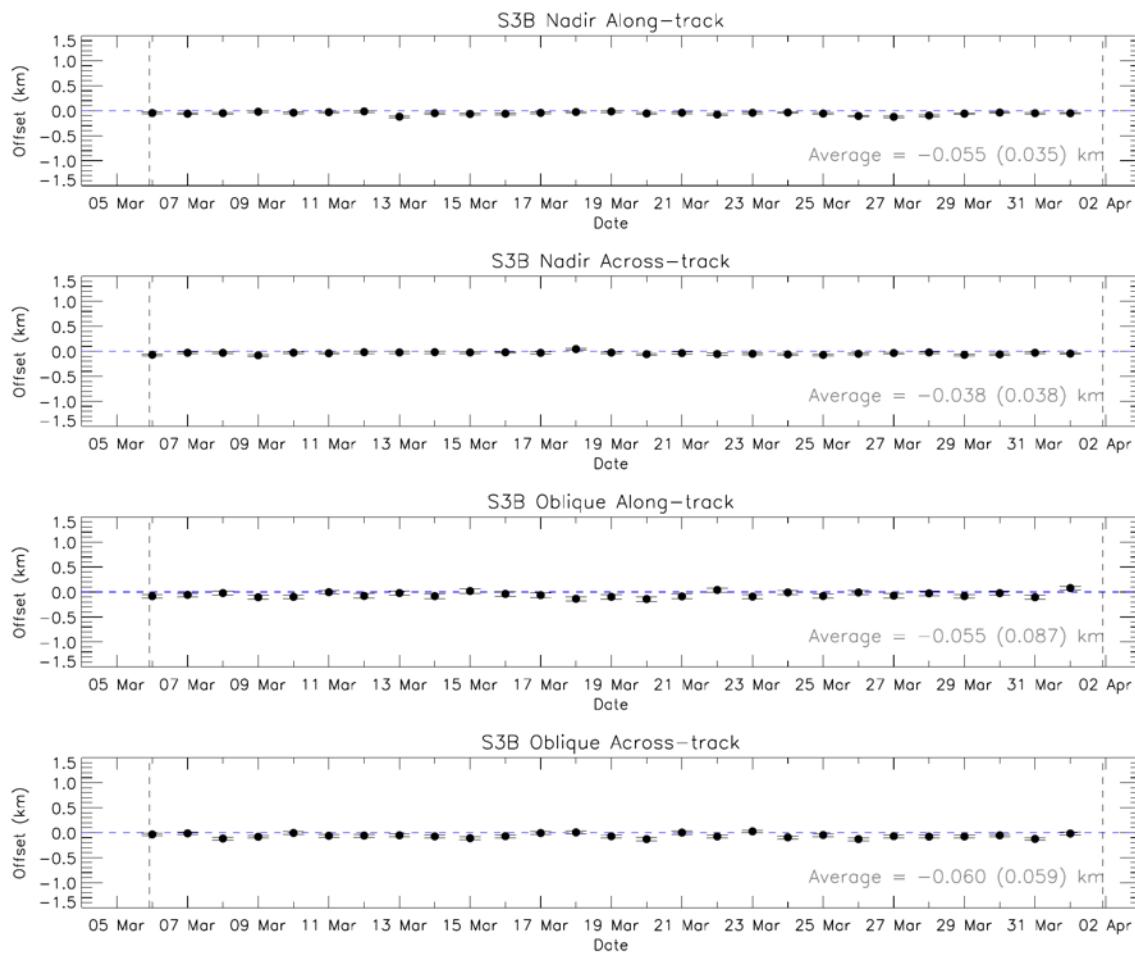


Figure 18: SLSTR-B daily offset results in km from the GeoCal Tool analysis for Nadir along- and across-track (top two plots) and Oblique along- and across-track (bottom two plots) for Cycle 050. The error bars show the standard deviation.

The offset for SLSTR-A on 17th March corresponds to the out-of-plane manoeuvre performed on that day (see Section 6.1).

	Sentinel-3 MPC S3 SLSTR Cyclic Performance Report S3A Cycle No. 069 – S3B Cycle No. 050	Ref.: S3MPC.RAL.PR.02-069-050 Issue: 1.0 Date: 08/04/2021 Page: 24
--	--	---

3.2 Radiometric validation

The radiometric calibration of the visible and SWIR channels is monitored using the S3ETRAC service. The S3ETRAC service extracts OLCI and SLSTR Level-1 data and computes associated statistics over 49 sites corresponding to different surface types (desert, snow, ocean maximising Rayleigh signal, and ocean maximising sunglint scattering). These S3ETRAC products are used for the assessment and monitoring of the VIS and SWIR radiometry by the ESL.

Details of the S3ETRAC/SLSTR statistics are provided on the S3ETRAC website <http://s3etrac.acri.fr/index.php?action=generalstatistics#pageSLSTR>

- ❖ Number of SLSTR products processed by the S3ETRAC service
- ❖ Statistics per type of target (DESERT, SNOW, RAYLEIGH, SUNGLINT)
- ❖ Statistics per site
- ❖ Statistics on the number of records

Figure 19 and Figure 20 show the results of the inter-comparison analysis of SLSTR-A with OLCI-A and SLSTR-B with OLCI-B over desert sites. Figure 21 and Figure 22 show the results of an inter-comparison analysis of SLSTR-A and SLSTR-B with AATSR, and Figure 23 shows the results of the inter-comparison analysis with MODIS. Average ratios in each case are given in the figures.

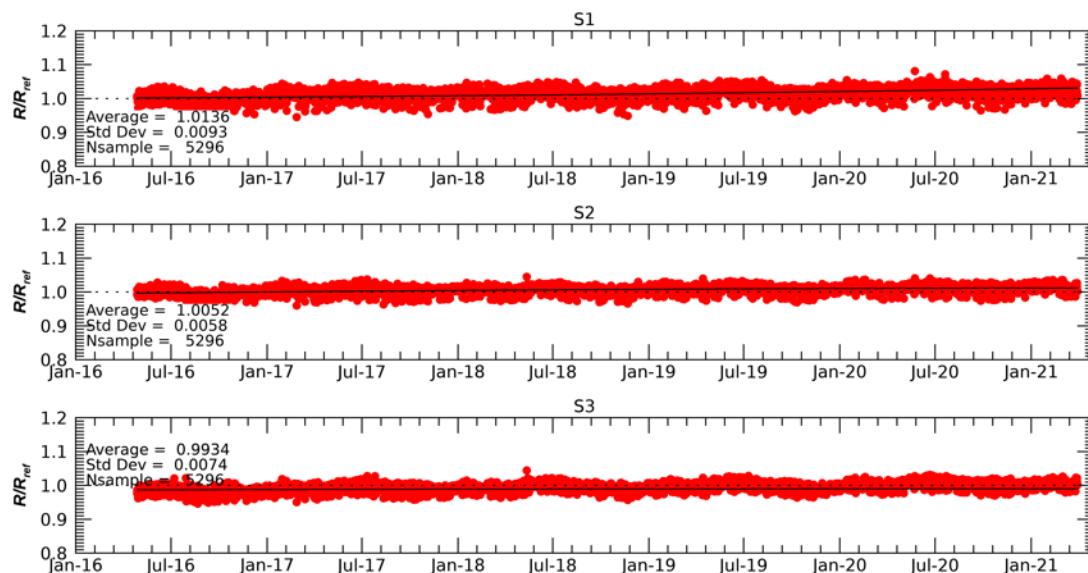


Figure 19: Ratio of SLSTR-A and OLCI-A radiances for the visible channels in Nadir view using combined results for all desert sites.

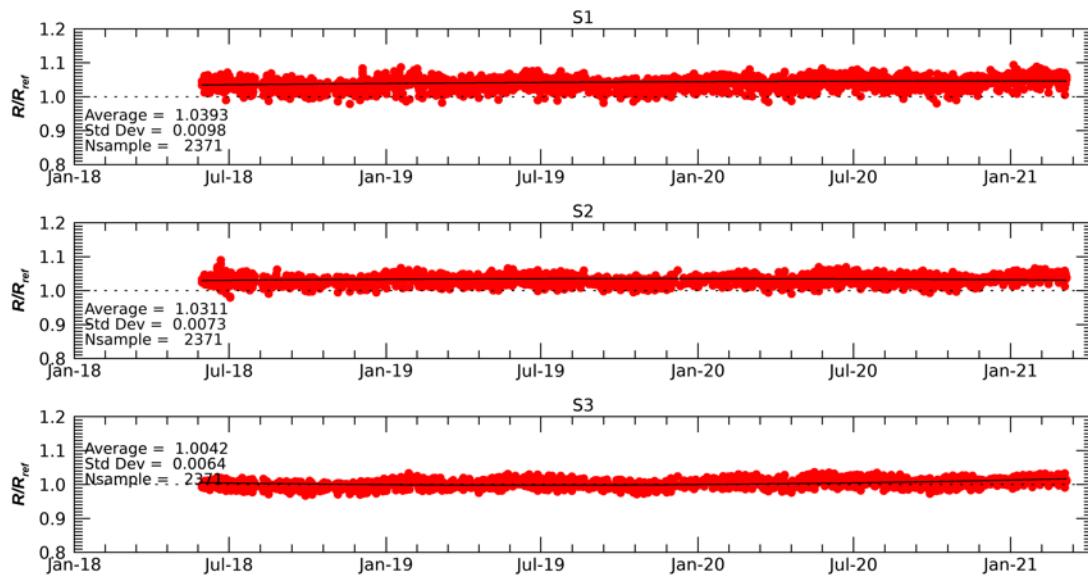


Figure 20: Ratio of SLSTR-B and OLCI-B radiances for the visible channels in Nadir view using combined results for all desert sites.

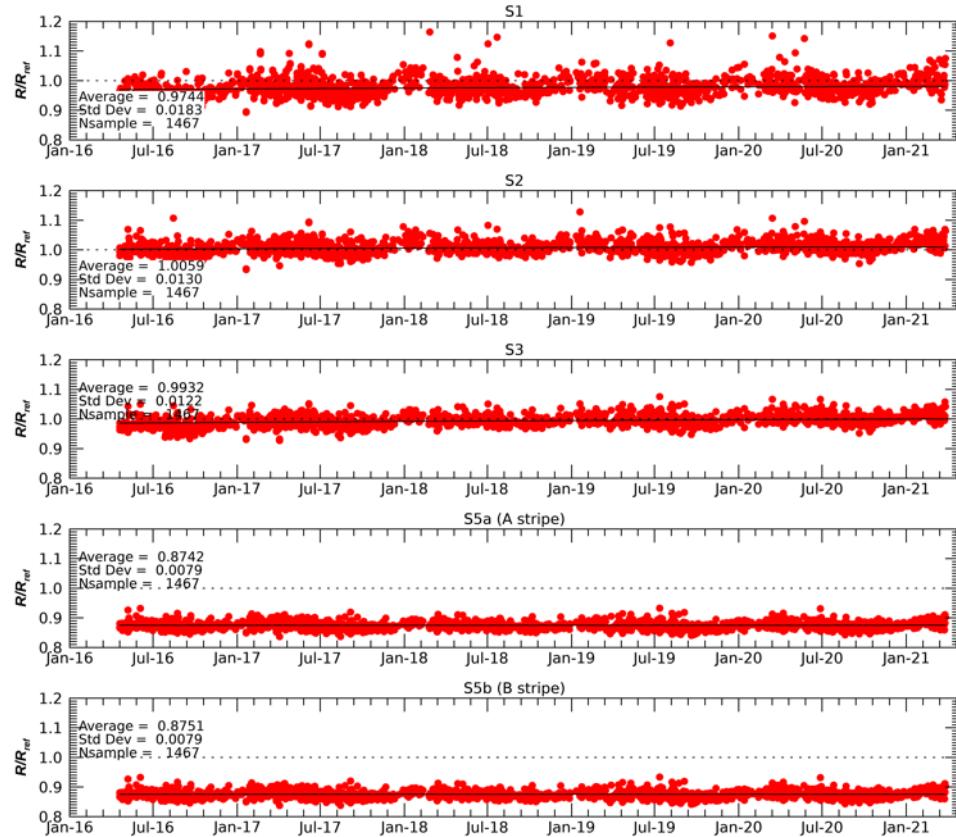


Figure 21: Ratio of SLSTR-A with AATST radiances in Nadir view using combined results for all desert sites.



Sentinel-3 MPC
S3 SLSTR Cyclic Performance Report
S3A Cycle No. 069 – S3B Cycle No. 050

Ref.: S3MPC.RAL.PR.02-069-050
Issue: 1.0
Date: 08/04/2021
Page: 26

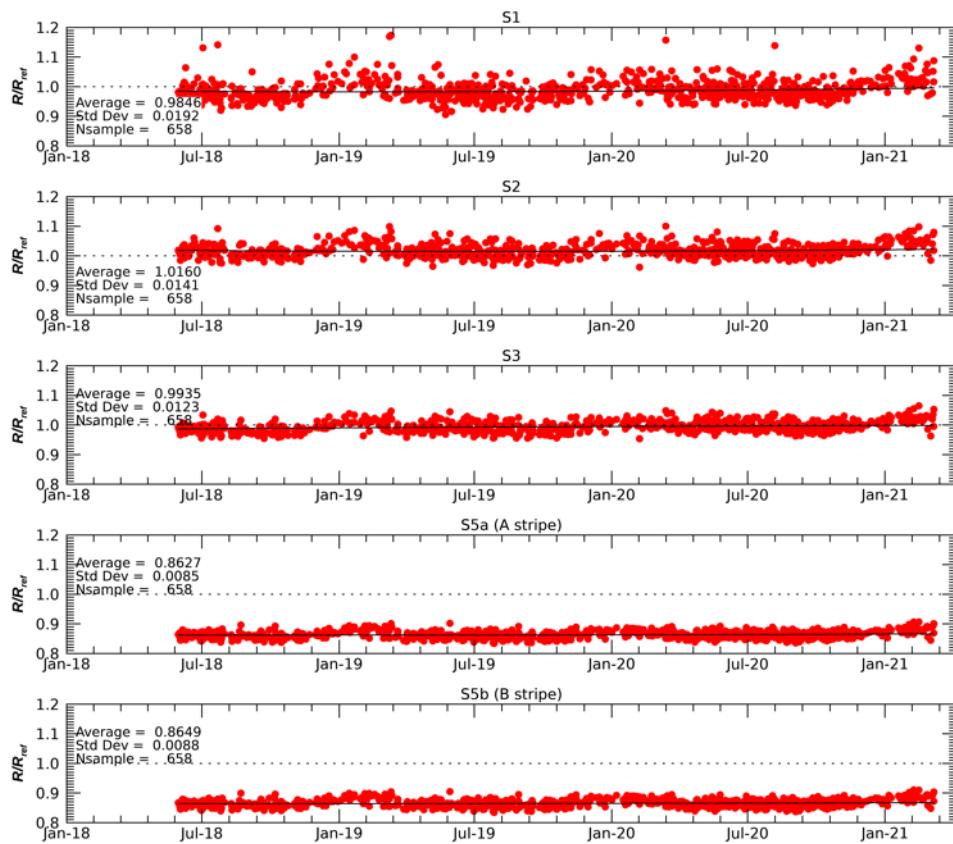


Figure 22: Ratio of SLSTR-B with AATST radiances in Nadir view using combined results for all desert sites.



Sentinel-3 MPC

S3 SLSTR Cyclic Performance Report

S3A Cycle No. 069 – S3B Cycle No. 050

Ref.: S3MPC.RAL.PR.02-069-050

Issue: 1.0

Date: 08/04/2021

Page: 27

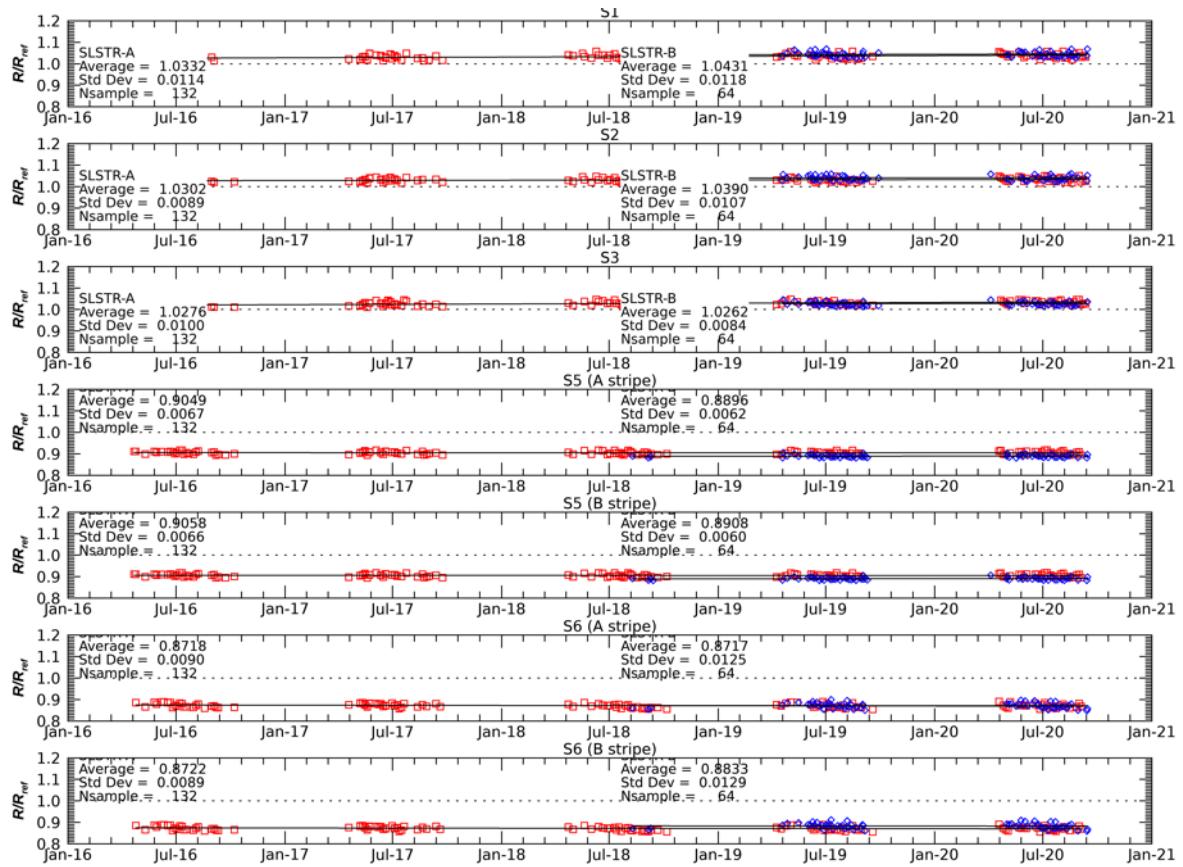


Figure 23: Ratio of SLSTR-A (red) and SLSTR-B (blue) with MODIS radiances in Nadir view using combined results for all desert sites.

 Sentinel-3 MPC S3 SLSTR Cyclic Performance Report S3A Cycle No. 069 – S3B Cycle No. 050	Ref.: S3MPC.RAL.PR.02-069-050 Issue: 1.0 Date: 08/04/2021 Page: 28
--	---

3.3 Image quality

The Level-1 image quality is assessed when data are available at the MPC. For example by combining all granules over one day into a single combined image. The S3A and S3B satellites are configured to be 140 degrees out of phase in order to observe complimentary portions of the earth. Figure 24 shows an example combined SLSTR-A/SLSTR-B image for the visible channels from the previous cycle on 12th March 2021 (daytime only).

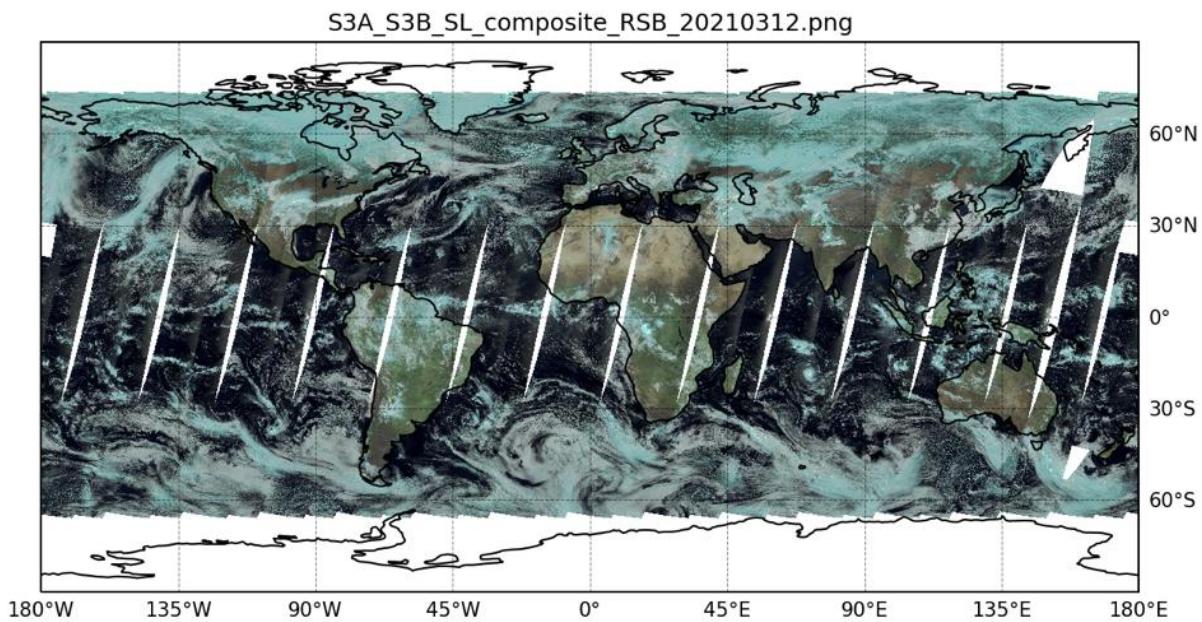


Figure 24: Daytime combined SLSTR-A and SLSTR-B Level-1 image for visible channels on 12th March 2021.



Sentinel-3 MPC
S3 SLSTR Cyclic Performance Report
S3A Cycle No. 069 – S3B Cycle No. 050

Ref.: S3MPC.RAL.PR.02-069-050
Issue: 1.0
Date: 08/04/2021
Page: 29

4 Level-2 SST validation

Level-2 SST validation is under the responsibility of EUMETSAT.

	Sentinel-3 MPC S3 SLSTR Cyclic Performance Report S3A Cycle No. 069 – S3B Cycle No. 050	Ref.: S3MPC.RAL.PR.02-069-050 Issue: 1.0 Date: 08/04/2021 Page: 30
--	--	---

5 Level 2 LST validation

Level 2 Land Surface Temperature products have been validated against *in situ* observations (Category-A validation) from twelve “Gold Standard” Stations, and intercompared (Category-C validation) with respect to an independent operational reference product (SEVIRI from LSA SAF). In all cases it is the NTC products that are validated, and the Probabilistic cloud masking implementation is used for all cloud masking. Level-3C products for the full Cycles 069 for SLSTR-A and 050 for SLSTR-B are evaluated for identifying any gross problems. Both S3A and S3B L2 products are produced with the updated LST coefficients following the operational release on 25th February 2019. In each case the latest temporal interpolation for the probabilistic cloud mask is applied following the L1 operational release on 15th January 2020. The updated cloud coefficients ADF was applied on 23rd October 2020.

5.1 Category-A validation

Category-A validation uses a comparison of satellite-retrieved LST with *in situ* measurements collected from radiometers sited at a number of stations spread across the Earth, for which the highest-quality validation can be achieved. Here we concentrate on twelve “Gold Standard” stations which are installed with well-calibrated instrumentation: seven from the SURFRAD network (Bondville, Illinois; Desert Rock, Nevada; Fort Peck, Montana; Goodwin Creek, Mississippi; Penn State University, Pennsylvania; Sioux Fall, South Dakota; Table Mountain, Colorado); two from the ARM network (Southern Great Plains, Oklahoma; Barrow, Alaska); and three from the USCRN network (Williams, Arizona; Des Moines, Iowa; Manhatten, Kansas). The results can be summarised as follows:

Satellite	Average absolute accuracy vs. Gold Standard (K)	
	Day	Night
S3A	1.1	0.6
S3B	1.2	0.6

For both SLSTR-A and SLSTR-B both the daytime and night-time accuracies are within or very close to the mission requirement of 1K, even though they are impacted to some extent by very small number of matchups for some stations in the cycle due to actual cloud, or over-masking. The number of matchups across most stations for daytime are very low particularly during the day, and have impacted the biases to an extent. An updated cloud coefficients ADF was delivered on 23rd October 2020. Processing issues on the CTCP have considerably impacted the number of matchups in these cycles affecting the bias statistics.



Sentinel-3 MPC

S3 SLSTR Cyclic Performance Report

S3A Cycle No. 069 – S3B Cycle No. 050

Ref.: S3MPC.RAL.PR.02-069-050

Issue: 1.0

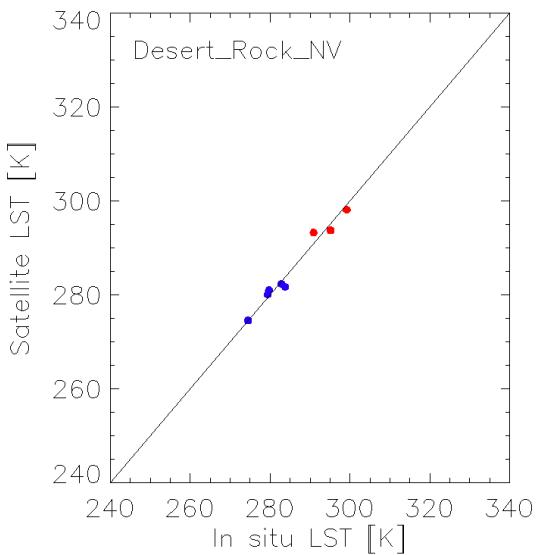
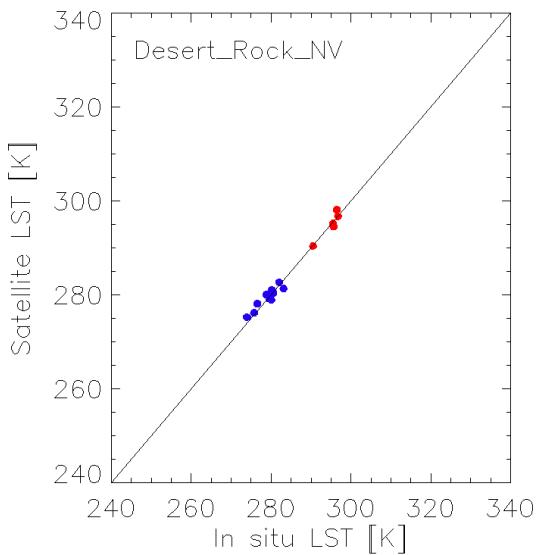
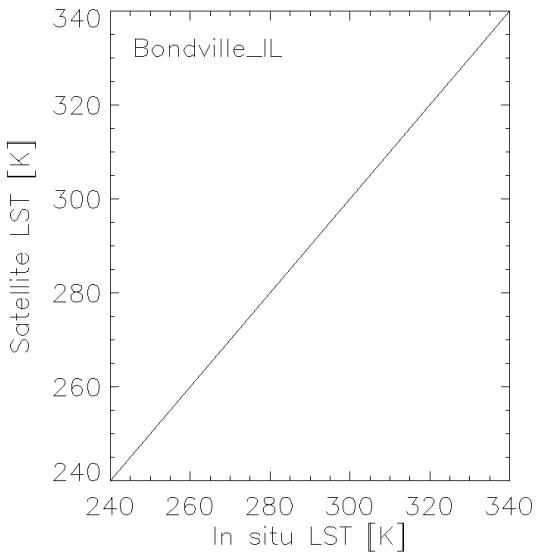
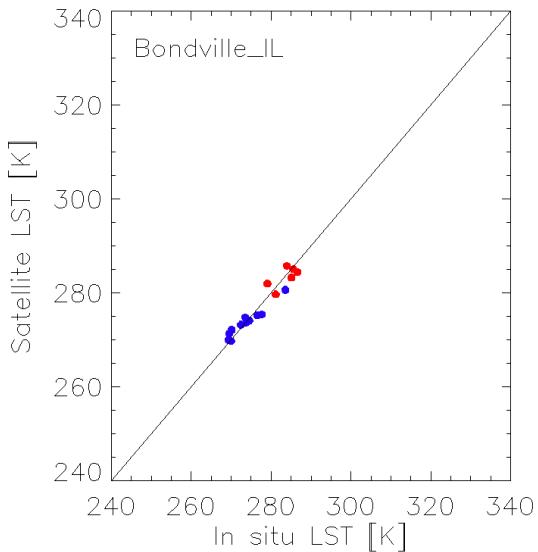
Date: 08/04/2021

Page: 31

Validation of the SL_2_LST product over Cycle 069 (SLSTR-A) and Cycle 050 (SLSTR-B) at seven Gold Standard in situ stations of the SURFRAD network plus two Gold Standard station from the ARM network, and two Gold Standard station from the USCRN network

SLSTR-A

SLSTR-B





Sentinel-3 MPC

S3 SLSTR Cyclic Performance Report

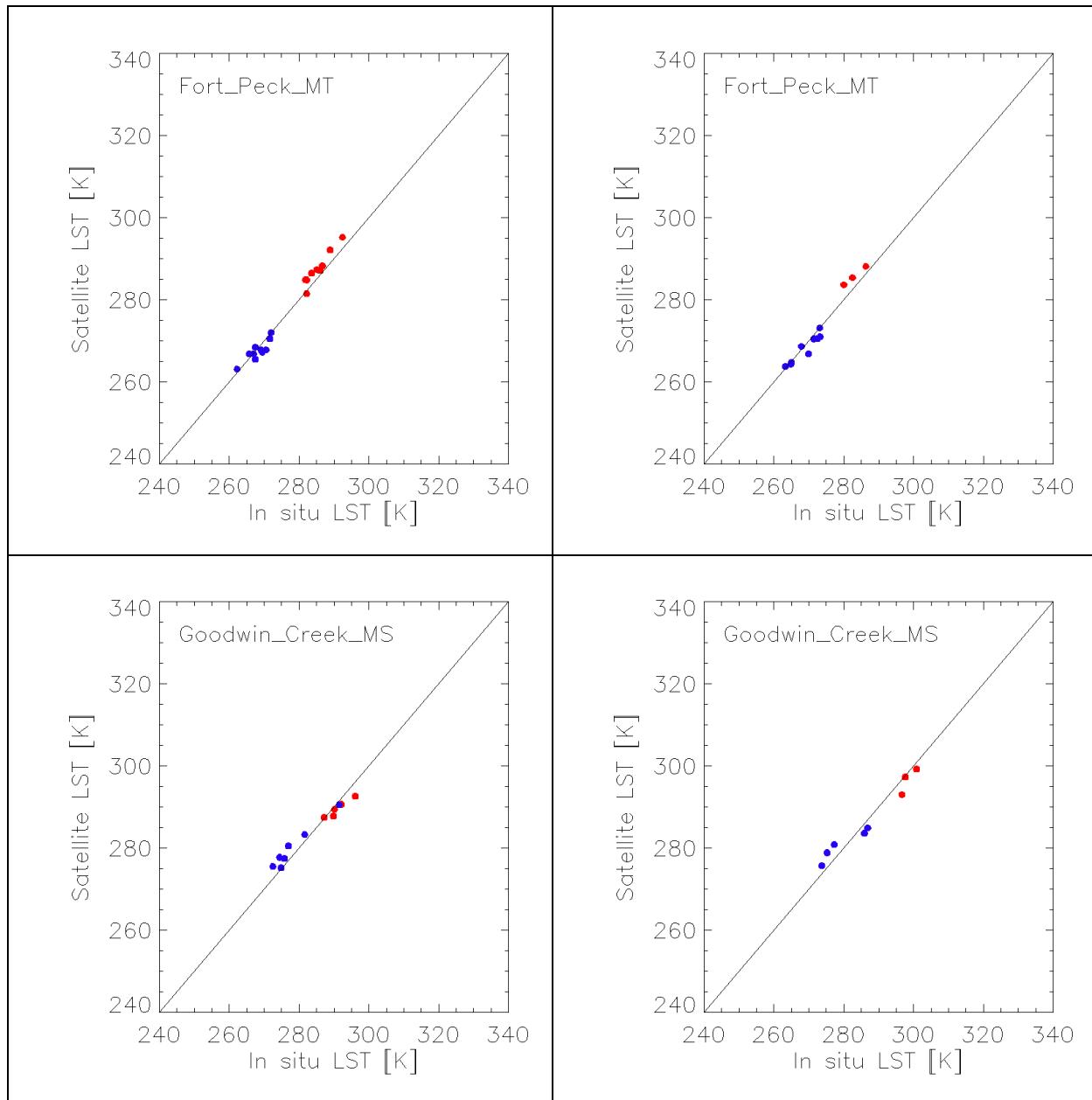
S3A Cycle No. 069 – S3B Cycle No. 050

Ref.: S3MPC.RAL.PR.02-069-050

Issue: 1.0

Date: 08/04/2021

Page: 32





Sentinel-3 MPC

S3 SLSTR Cyclic Performance Report

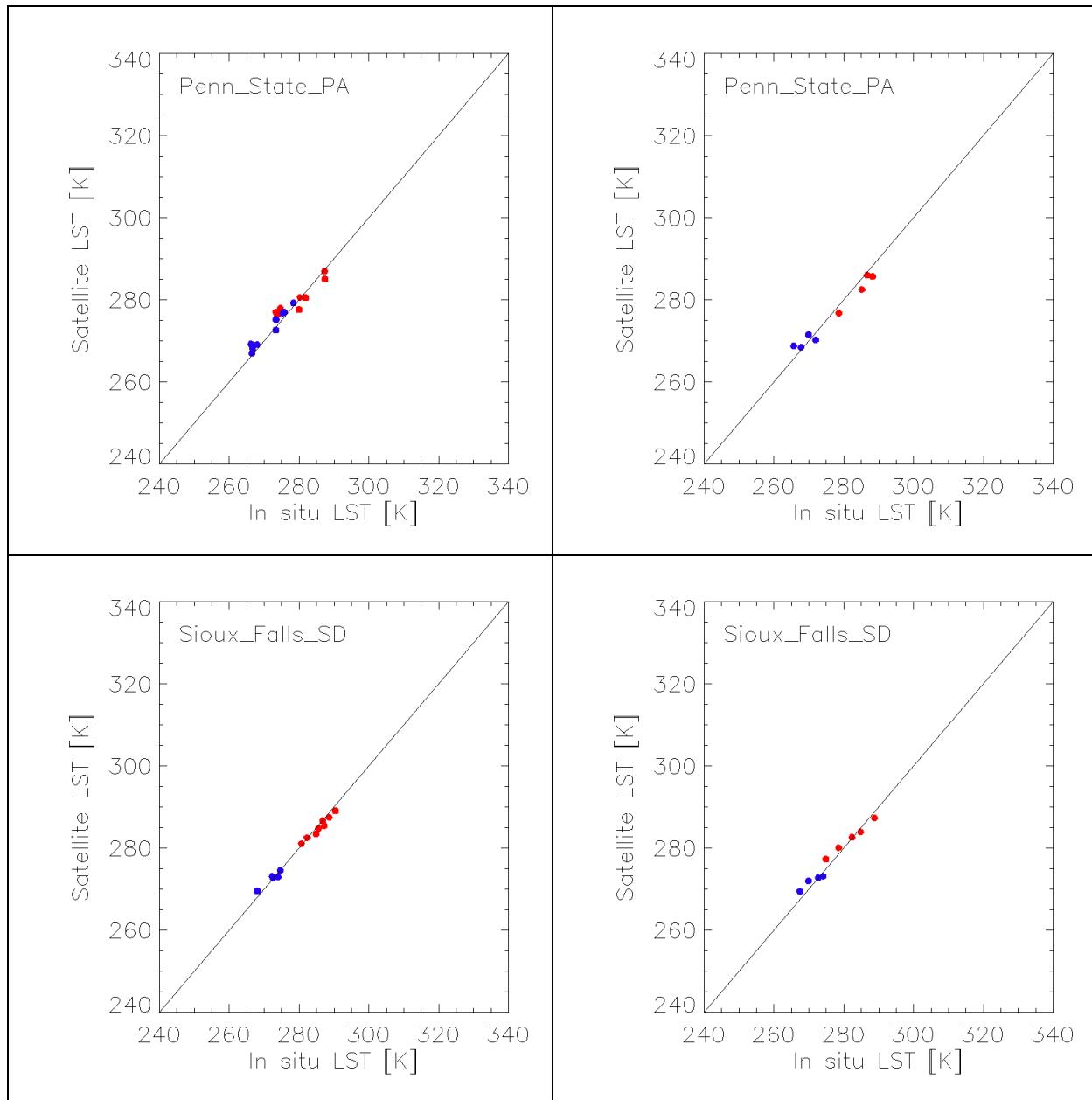
S3A Cycle No. 069 – S3B Cycle No. 050

Ref.: S3MPC.RAL.PR.02-069-050

Issue: 1.0

Date: 08/04/2021

Page: 33





Sentinel-3 MPC

S3 SLSTR Cyclic Performance Report

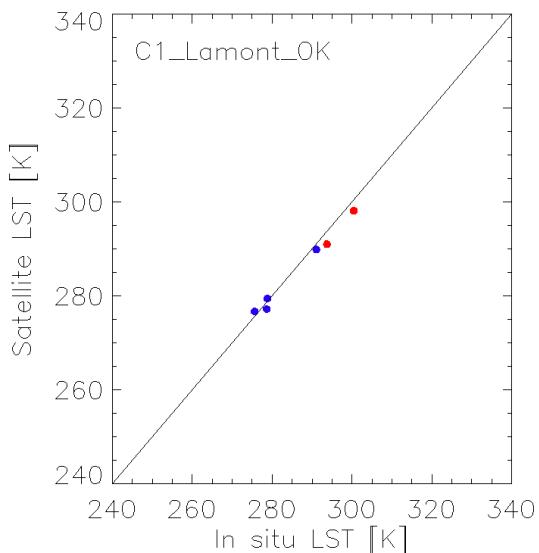
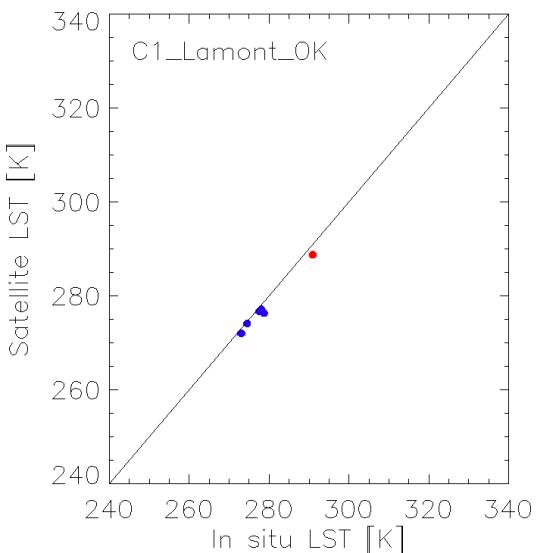
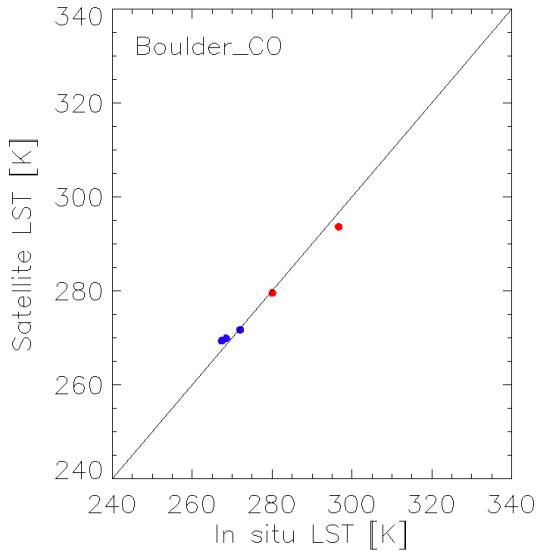
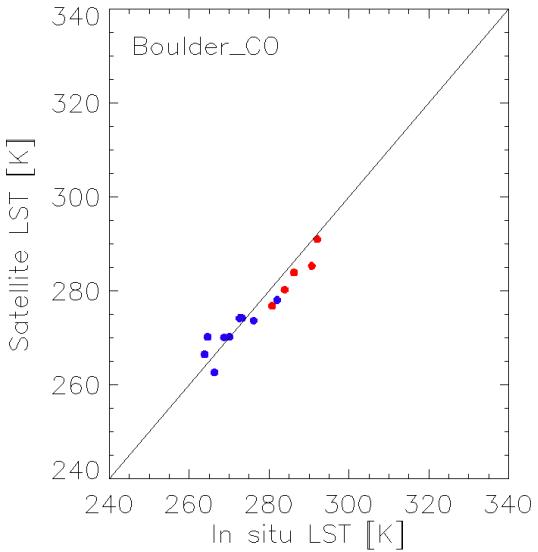
S3A Cycle No. 069 – S3B Cycle No. 050

Ref.: S3MPC.RAL.PR.02-069-050

Issue: 1.0

Date: 08/04/2021

Page: 34





Sentinel-3 MPC

S3 SLSTR Cyclic Performance Report

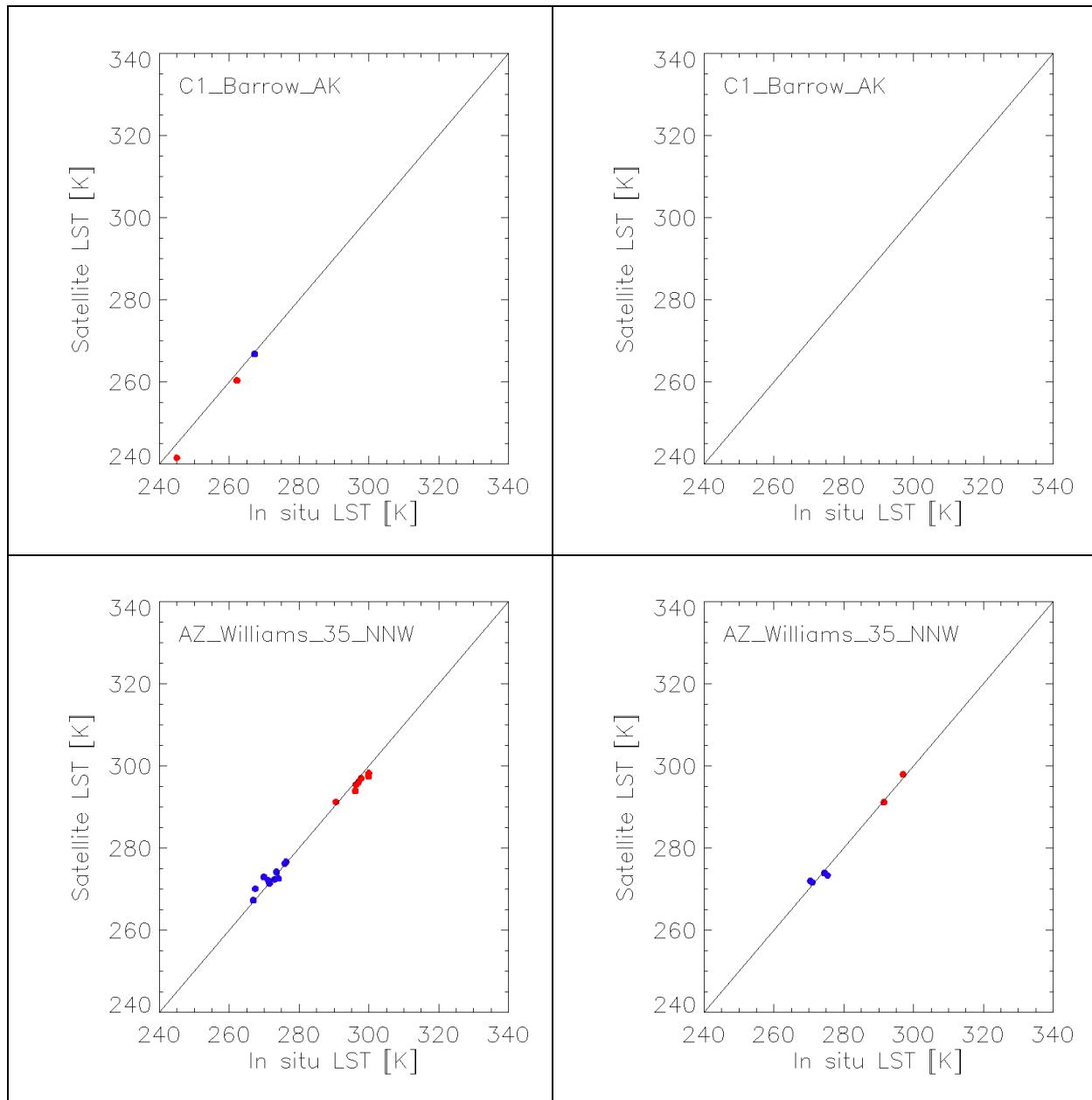
S3A Cycle No. 069 – S3B Cycle No. 050

Ref.: S3MPC.RAL.PR.02-069-050

Issue: 1.0

Date: 08/04/2021

Page: 35





Sentinel-3 MPC

S3 SLSTR Cyclic Performance Report

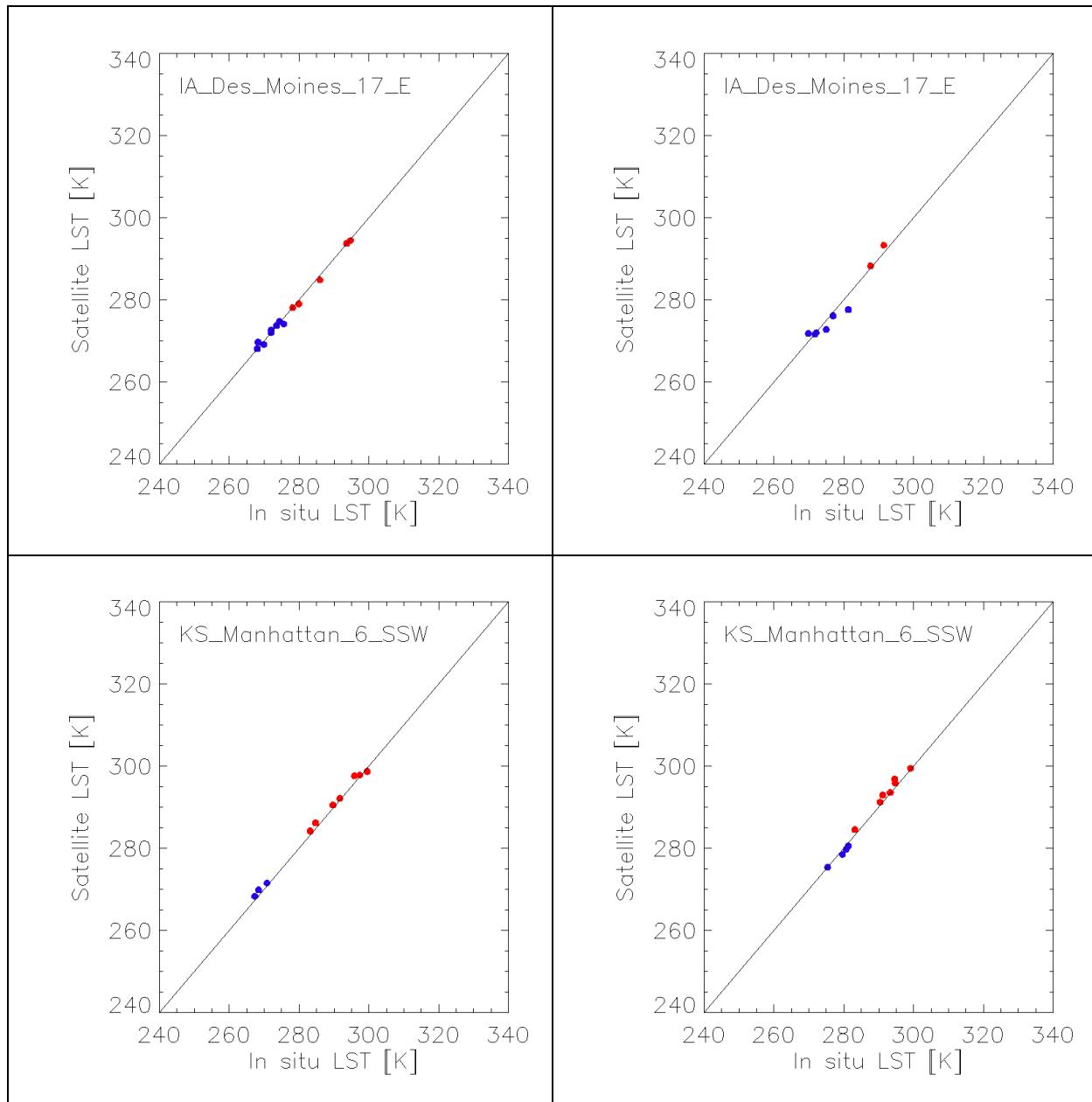
S3A Cycle No. 069 – S3B Cycle No. 050

Ref.: S3MPC.RAL.PR.02-069-050

Issue: 1.0

Date: 08/04/2021

Page: 36



As with past cycles cloud has reduced the number of matchups per station to single figures for most stations during day or night, with some missing statistics entirely. It is therefore challenging to determine robust statistics. Nonetheless, it can be seen that overall the matchups are in general close to the 1:1 line with very few outliers. No systematic bias is evident from these matchups.

	Sentinel-3 MPC S3 SLSTR Cyclic Performance Report S3A Cycle No. 069 – S3B Cycle No. 050	Ref.: S3MPC.RAL.PR.02-069-050 Issue: 1.0 Date: 08/04/2021 Page: 37
--	--	---

5.2 Category-C validation

Category-C validation uses inter-comparisons with similar LST products from other sources such as other satellite sensors, which give important quality information with respect to spatial patterns in LST deviations. Here we compare the SL_2_LST product from both SLSTR-A and SLSTR-B with the operational SEVIRI L2 product available from the LSA SAF. The results can be summarised:

Continent	Median differences in K from the intercomparison of the SL_2_LST product with respect to the operational LSA SAF SEVIRI LST product for the period of Cycle 069 (SLSTR-A) and Cycle 050 (SLSTR-B)			
	SLSTR-A		SLSTR-B	
	Day	Night	Day	Night
Africa	0.2	0.1	0.2	0.2
Europe	0.9	1.6	1.0	1.6

For both Africa and Europe, the differences across the continent for both SLSTR-A and SLSTR-B are relatively small, with very few locations with larger differences. This is the same for both SLSTR-A and SLSTR-B and is primarily driven by differences in viewing geometry between the SLSTR instruments and SEVIRI and is expected. Eastern matchups (such as over the Arabian Peninsula and north-eastern Europe) are towards the edge of the SEVIRI disk and therefore represent large viewing angles. At these extreme viewing angles it is expected that SLSTR LST would be increasingly higher than SEVIRI LST. For both daytime and night-time the differences are mainly < 1K for Africa for both SLSTR-A and SLSTR-B. During daytime differences are over 1K for Europe as a result of increasing differences due to geometry as days get warmer. Differences are not the same as previous cycles for both Europe and Africa which may indicate responses due to changing seasons.

Other analysis can be summarised as follows:

- ❖ Differences with respect to biomes tend to be larger during the day for surfaces with more heterogeneity and/or higher solar insolation
- ❖ Differences increase for both day and night towards the edge of the SEVIRI disk as the SEVIRI zenith angles become larger



Sentinel-3 MPC

S3 SLSTR Cyclic Performance Report

S3A Cycle No. 069 – S3B Cycle No. 050

Ref.: S3MPC.RAL.PR.02-069-050

Issue: 1.0

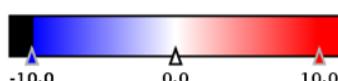
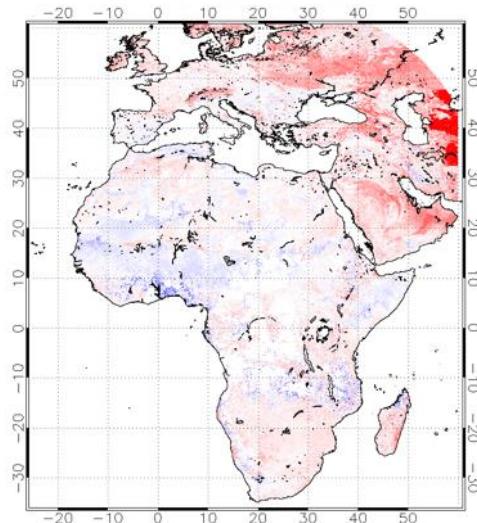
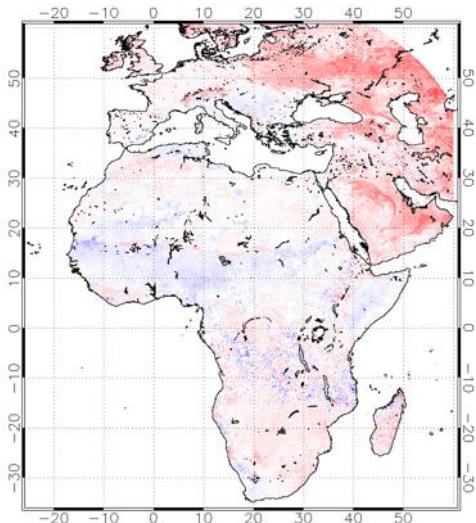
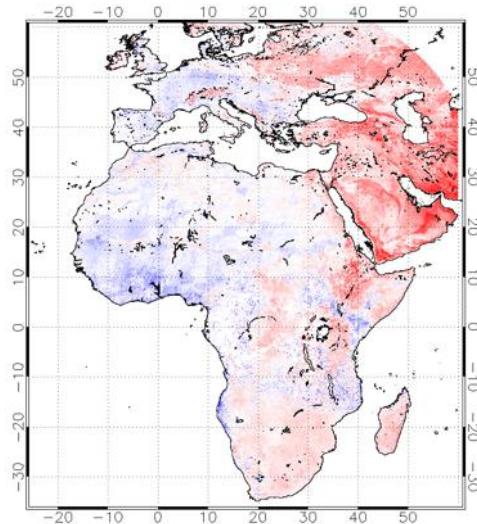
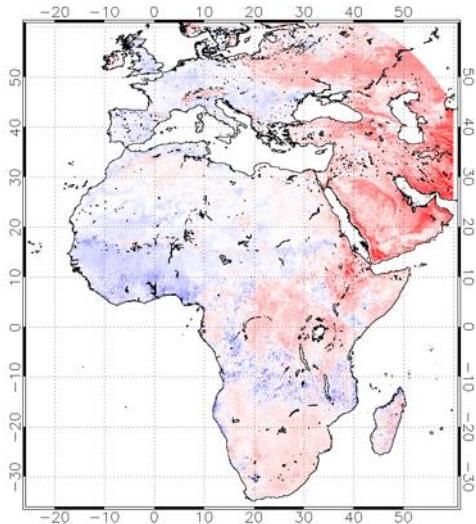
Date: 08/04/2021

Page: 38

Intercomparison of the SL_2_LST product with respect to the operational LSA SAF SEVIRI LST product for the period of Cycle 069 (SLSTR-A) and Cycle 050 (SLSTR-B). Daytime composites are in the top row and Night-time composites are in the bottom row

SLSTR-A

SLSTR-B



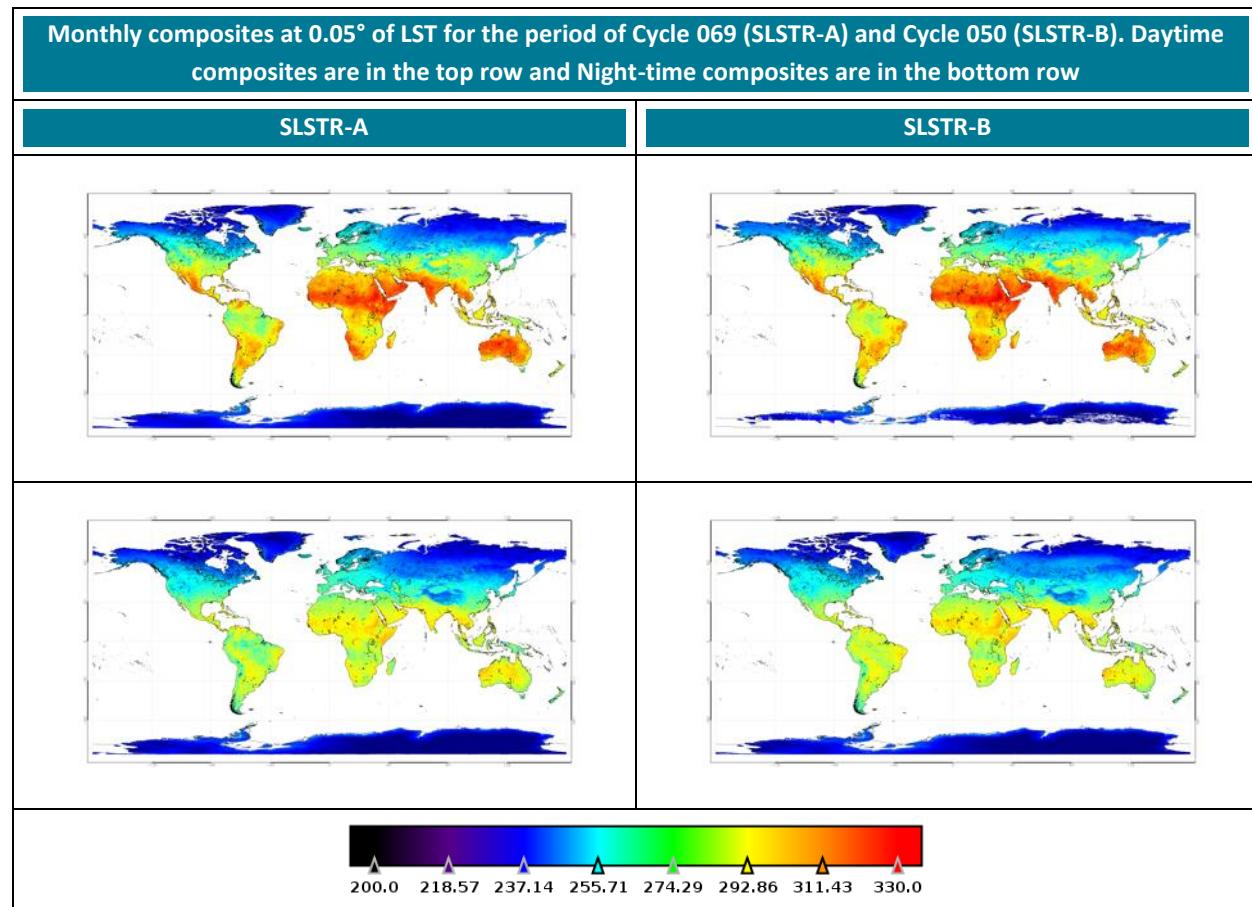
While some of these differences are > 1 K they are all within the corresponding uncertainty of SEVIRI at the pixel-scale (> 2K), and so the **two products can be assessed as being consistent**. It should also be noted that there are no significant differences between the two products in terms of biome-dependency - the differences are consistent across biomes. Some residual cloud contamination is evident from the large differences at the edge of cloud cleared features. While the cloud contamination is seen for both

 Sentinel-3 MPC S3 SLSTR Cyclic Performance Report S3A Cycle No. 069 – S3B Cycle No. 050	Ref.: S3MPC.RAL.PR.02-069-050 Issue: 1.0 Date: 08/04/2021 Page: 39
--	---

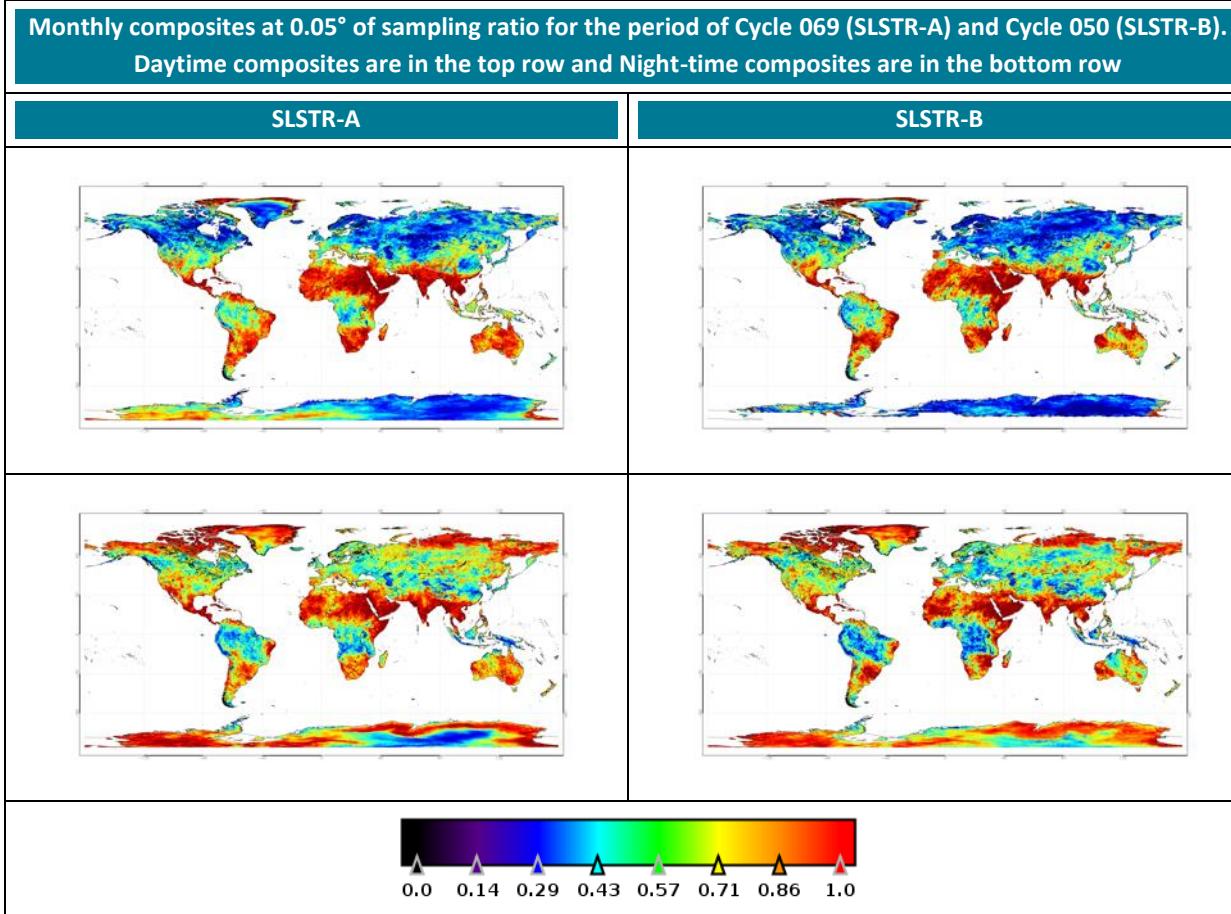
SLSTR (strong negative differences) and SEVIRI (strong positive differences), compared with cycles where the basic cloud mask was used the contamination for SLSTR is lower indicating improved masking with the Probabilistic Cloud Mask. However, less matchups are evident which suggests the cloud masking could be slightly over conservative in some biomes. This will be monitored over the following Cycles to identify whether an optimisation to the cloud coefficients should be considered for some biomes.

5.3 Level-3C Assessment

To better understand the global product and identify any gross issues Level-3 evaluation is also performed. Here we generate monthly daytime and night-time 0.05° composites of the LST field and corresponding sampling ratios. The sampling ratios are derived as clear_pixels / (clear_pixels + cloudy_pixels).



 Sentinel-3 MPC S3 SLSTR Cyclic Performance Report S3A Cycle No. 069 – S3B Cycle No. 050	Ref.: S3MPC.RAL.PR.02-069-050 Issue: 1.0 Date: 08/04/2021 Page: 40
--	---



The LST fields indicate the SL_2_LST product is producing values in line with expectations for both SLSTR-A and SLSTR-B. There are no distinct issues or non-physical values evident. The sampling ratio is now closer to what would be expected across the globe following the implementation of the temporal interpolation for the probabilistic cloud mask on 15th January 2020. Cloud contamination appears to be low, although there appears to be some excessive cloud clearing in some regions and undermasking in other, indicating the cloud coefficients ADF will need tuning for both instruments now the issue regarding the temporal interpolation has been resolved. The update to the ADF has now been implemented as of 23rd October 2020.

	Sentinel-3 MPC S3 SLSTR Cyclic Performance Report S3A Cycle No. 069 – S3B Cycle No. 050	Ref.: S3MPC.RAL.PR.02-069-050 Issue: 1.0 Date: 08/04/2021 Page: 41
--	--	---

6 Events

6.1 SLSTR-A

SLSTR-A was switched on and operating nominally during the cycle, with SUE scanning and autonomous switching between day and night modes, except for the following events:

- ❖ 26th February 2021, 12:07-12:17 – data gaps caused by radio frequency interference
- ❖ 28th February 2021, 11:40-11:46 – data gaps caused by radio frequency interference
- ❖ 10th March 2021, 13:06-13:11 – data gaps caused by radio frequency interference
- ❖ 14th March 2021, 21:47-21:57 – data gaps caused by radio frequency interference
- ❖ 17th March 2021, 07:01-07:36 – possible pointing errors caused by out-of-plane manoeuvre
- ❖ 20th March 2021, 20:21-20:31 – data gaps caused by radio frequency interference
- ❖ 21st March 2021, 16:35-16:40 – data gaps caused by radio frequency interference

6.2 SLSTR-B

SLSTR-B was switched on and operating nominally during the cycle, with SUE scanning and autonomous switching between day and night modes, except for the following events:

- ❖ 15th March 2021, 10:27-10:32 – data gaps caused by radio frequency interference
- ❖ 29th March 2021, 23:52-23:57 – data gaps caused by PDHU anomaly

 <p>SENTINEL-3 Mission Performance Centre</p>	<p>Sentinel-3 MPC</p> <p>S3 SLSTR Cyclic Performance Report</p> <p>S3A Cycle No. 069 – S3B Cycle No. 050</p>	<p>Ref.: S3MPC.RAL.PR.02-069-050 Issue: 1.0 Date: 08/04/2021 Page: 42</p>
--	---	---

7 Appendix A

Other reports related to the Optical mission are:

- ❖ S3 OLCI Cyclic Performance Report, S3A Cycle No. 069, S3B Cycle No. 050 (ref. S3MPC.ACR.PR.01-069-050)

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

End of document