MONTHLY OPERATIONS REPORT

MOR#061

Reporting period from 16-Dec-2018 to 15-Jan-2019

Reference: ***PROBA-V_D5_MOR-061_01_v1.0***
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Release	Date	Pages	Description	Editor(s)/Reviewer(s)
1.0	**17/01/2019**	All	Initial version	

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1. Summary

Due to an on-board anomaly that occurred on 24/12, nearly two consecutive days of data are not recorded. Data is missing for following dates:

- 24/12/2018: Most of N-America
- 25/12/2018: Entire globe
- 26/12/2018: Entire globe, except for Alaska

The platform was restored from safe mode on 26/12, but due to lower on-board temperatures, data following the recovery was discarded until the platform reached nominal operating temperatures.

For the remainder of this reporting period, the majority of the the synthesis products were nearly complete. Most missing data in the synthesis products were caused by automatic recoveries of the platform or one missing TFF file. Decompression and geometric errors had only a minor impact on the missing data in the past month. On January 7th, an overpass was missed because an automatic recovery occured during the X-band pass, this resulted in data loss for that day.

On December 21, it was decided to reduce the systematic acquisition of the Antarctica continent due to on-board mass memory limitations . From then onwards only the center camera was used to record the Antarctica continent.

On January 7 and 15 an automatic recovery occurred while the satellite was in 'eclipse' mode which resulted in all recorded segments to be flagged as Antarctica segments until Antarctica was passed again. An update to the startup script has been made to fix this issue.

No anomalies were detected in the geometric assessment for past month.

Similar as during last month the DCC calibration results show a sudden increase in the NIR band results of about 1.5%. It is currently thought to be related to the significant increase in the instrument temperature from about -3° in October 2018 to 2° in January 2019 during the DCC observations.We are now evaluating possible actions that could be taken to reduce the impact.

The yaw maneuver data of summer 2018 have been fully analyzed; the results will be documented in a dedicated report.

13 new users registered this month and more than 9.5 TB has been delivered in the past month.

No new developments are expected in the coming period.

2. System Infrastructure

Category	% Up Time	% Down Time
Switches	100.0	0.0
Database Servers	100.0	0.0
Mid Term File Servers	100.0	0.0
Short Term File Servers	100.0	0.0
Master Servers	100.0	0.0
Worker Nodes	100.0	0.0
PDF	100.0	0.0

Table 1: System Infrastructure availability for this reporting period

3. Image Processing Services

3.1. Ingested and archived products

Product Type	Total	Received	Missing data, ingested by VITO	Archived
METEO	248	248	0	247
TFF	325	304	21(*)	304

Table 2: Ingested and archived products for this reporting period

(*) TFF 19240: Number missing; TFF 19313 till 19330 missing: problems due to Satellite in save mode; TFF 19390 and TFF 19459: No DCR file

3.2. Generated and archived products

Product Type	Total	Processed	Error	Archived
PROBAV_L1A - Calibration	191	191	0	191
PROBAV_L1A - Nominal	2402	2373	29	2401
PROBAV_L1C	2373	2373	0	2373
PROBAV_L2A_100M	825	825	0	825
PROBAV_L2A_300M	2373	2373	0	2373
PROBAV_L2A_1KM	2373	2373	0	2373
PROBAV_L3_S1_TOA_100M	31	30	1	30

PROBAV_L3_S1_TOC_100M	31	30	1	30
PROBAV_L3_S1_TOC_NDVI_100M	31	30	1	30
PROBAV_L3_S5_TOA_100M	6	6	0	6
PROBAV_L3_S5_TOC_100M	6	6	0	6
PROBAV_L3_S5_TOC_NDVI_100M	6	6	0	6
PROBAV_L3_S1_TOA_300M	31	30	1	30
PROBAV_L3_S1_TOC_300M	31	30	1	30
PROBAV_L3_S10_TOC_300M	3	3	0	3
PROBAV_L3_S10_TOC_NDVI_300M	3	3	0	3
PROBAV_L3_S1_TOA_1KM	31	30	1	30
PROBAV_L3_S1_TOC_1KM	31	30	1	30
PROBAV_L3_S10_TOC_1KM	3	3	0	3
PROBAV_L3_S10_TOC_NDVI_1KM	3	3	0	3

Table 3: Generated and archived products for this reporting period
18x L1A error due to radiometric processing; 10 x L1A error due to geometric processing; 1 x Error generating L1A
S1-Syntheses_TOA-TOC_100-300M and 1KM of 25/12/2018 are missing due to missing TFF's

3.3. Backup and archiving service

Product type	Total Files	Total File Size (GB)
TFF	315	786.19
L1A	3117	1436.53
Database transaction logs	737	69.15
Database incremental back-up	40	10.87
Database full back-up	7	318.32

Table 4: Back-up data volumes for this reporting period

Product type	Total Files	Total File Size (GB)
PROBAV_TRANSFERFRAMES	293	841.38
PROBAV_L1A	2488	1265.04
PROBAV_L1C	2275	2474.07
PROBAV_L2A_100M	1574	1106.60
PROBAV_L2A_300M	4547	631.14
PROBAV_L2A_1KM	4544	82.83
PROBAV_L3_S1_TOA_100M	58	1187.72
PROBAV_L3_S1_TOC_100M	59	1043.04
PROBAV_L3_S1_TOC_NDVI_100M	58	118.27

PROBAV_L3_S5_TOA_100M	12	1025.38
PROBAV_L3_S5_TOC_100M	12	925.70
PROBAV_L3_S5_TOC_NDVI_100M	12	103.50
PROBAV_L3_S1_TOA_300M	60	625.88
PROBAV_L3_S1_TOC_300M	60	567.88
PROBAV_L3_S10_TOC_300M	6	106.81
PROBAV_L3_S10_TOC_NDVI_300M	6	8.87
PROBAV_L3_S1_TOA_1KM	60	83.59
PROBAV_L3_S1_TOC_1KM	60	76.42
PROBAV_L3_S10_TOC_1KM	6	14.39
PROBAV_L3_S10_TOC_NDVI_1KM	6	1.11
ICP_GEOMETRIC_CENTRE	0	0
ICP_ GEOMETRIC _LEFT	0	0
ICP_ GEOMETRIC _RIGHT	0	0
ICP_RADIOMETRIC_CENTRE	1	0.04
ICP_RADIOMETRIC_LEFT	1	0.04
ICP_RADIOMETRIC_RIGHT	1	0.04
METEO_ECMWF	240	0.30
METEO_METEOSERVICES	239	1.27
POLARMOTION	1	0.00

Table 5: Archived data volumes for this reporting period

3.4. Dissemination service

Product type	Added to catalogue	Ordered	Delivered
PROBAV_L1C	2363	55	202
PROBAV_L2A_100M	817	1	6
PROBAV_L2A_300M	2363	36	222
PROBAV_L2A_1KM	2363	0	361
PROBAV_L3_S1_TOA_100M	29	295	100
PROBAV_L3_S1_TOC_100M	30	220	274
PROBAV_L3_S1_TOC_NDVI_100M	29	3576	3537
PROBAV_L3_S5_TOA_100M	6	9	91
PROBAV_L3_S5_TOC_100M	6	1325	1386
PROBAV_L3_S5_TOC_NDVI_100M	6	1098	1181
PROBAV_L3_S1_TOA_300M	30	92	111
PROBAV_L3_S1_TOC_300M	30	1149	1243
PROBAV_L3_S10_TOC_300M	3	39	36
PROBAV_L3_S10_TOC_NDVI_300M	3	165	168
PROBAV_L3_S1_TOA_1KM	30	504	459

PROBAV_L3_S1_TOC_1KM	30	113	150
PROBAV_L3_S10_TOC_1KM	3	122	124
PROBAV_L3_S10_TOC_NDVI_1KM	3	1844	2052

Table 6: Ordered and delivered products for this reporting period

3.5. End-user activity

13 new user(s) were registered in this reporting period.
The total number of users registered for PROBA-V data and that have ordered data is **1555** with **119** different nationalities representing **1159** different companies/universities.

Product type	Africa	Asia	Europe	N-America	Oceania	S-America
PROBAV_L1C	0	314.09	16.94	0	0	0
PROBAV_L2A_100M	0	0.28	0.03	0	0	3.75
PROBAV_L2A_300M	0	0.53	50.02	0	0	0
PROBAV_L2A_1KM	0	0	6.86	0	0	0
PROBAV_L3_S1_TOA_100M	0	0	2.43	0	0.08	0
PROBAV_L3_S1_TOC_100M	0	67.26	1643.06	497.62	0	0
PROBAV_L3_S1_TOC_NDVI_100M	0	60.03	0.59	0	0	0.05
PROBAV_L3_S5_TOA_100M	0	0.31	112.02	0	0	0.01
PROBAV_L3_S5_TOC_100M	20.67	2214.18	399.58	0	0	1356.88
PROBAV_L3_S5_TOC_NDVI_100M	62.03	638.08	74.69	0	0	0.54
PROBAV_L3_S1_TOA_300M	0	2.97	561.93	0	0	0
PROBAV_L3_S1_TOC_300M	4.47	39.11	924.61	256.92	0	0
PROBAV_L3_S10_TOC_300M	2.32	2.47	154.62	2.39	0	0
PROBAV_L3_S10_TOC_NDVI_300M	0.03	31.33	0.01	0	0	0.05
PROBAV_L3_S1_TOA_1KM	0	0	82.97	0	0	0
PROBAV_L3_S1_TOC_1KM	0	0	142.38	0	0	0
PROBAV_L3_S10_TOC_1KM	0.74	0	15.33	0.51	0	0
PROBAV_L3_S10_TOC_NDVI_1KM	0.06	108.47	1.36	0.00	0	0.01

Table 7: Data download (GB) in total per Origin of the User for the reporting period

Product Type	Global
L1C	331.03
PROBAV_L2A_100M	4.07
PROBAV_L2A_300M	50.55
PROBAV_L2A_1KM	6.86
PROBAV_L3_S1_TOA_100M	2.52
PROBAV_L3_S1_TOC_100M	2207.94

PROBAV_L3_S1_TOC_NDVI_100M	60.67
PROBAV_L3_S5_TOA_100M	112.34
PROBAV_L3_S5_TOC_100M	3991.31
PROBAV_L3_S5_TOC_NDVI_100M	775.34
PROBAV_L3_S1_TOA_300M	564.90
PROBAV_L3_S1_TOC_300M	1225.11
PROBAV_L3_S10_TOC_300M	161.79
PROBAV_L3_S10_TOC_NDVI_300M	31.41
PROBAV_L3_S1_TOA_1KM	82.97
PROBAV_L3_S1_TOC_1KM	142.38
PROBAV_L3_S10_TOC_1KM	16.57
PROBAV_L3_S10_TOC_NDVI_1KM	109.90

Table 8: Data download (GB) in total for the reporting period

Company	# Downloads
CHINESE ACADEMY OF SCIENCES	3494
IGSNRR	1054
CESBIO	1028
HKBU	916
ARID LAND RESEARCH CENTER	693
VUB	578
ICBA	468
AGROWING	432
SICHUAN UNIVERSITY	373
BROCKMANN CONSULT GMBH	358

Table 9: Top 10 user companies for the reporting period

Country	# Users
CHINA	158
BELGIUM	130
FRANCE	74
UNITED STATES	70
INDIA	70
BRAZIL	70
ITALY	68
UNITED KINGDOM	56
NETHERLANDS	52
GERMANY	49

Table 10: Top 10 countries with most registered users

List of issues raised by users:

Creating python 2.7 environment
error authentication virtual machine
Log bestanden ontbreken
gn RUNNING in hspf HADOOP
zombie processen via hspf
PDF: N.A. - 2018/12/24 - How soon to prepare the data?
Calendar
Status applicatie
phonopy installation

4. Image Calibration services

4.1. Radiometric Calibration

Calibration request type	Total	Processed	Not received	Error
CLOUDS	15	13	2	0
DARK CURRENT	18	15	3	0
MOON	2	2	0	0
RAYLEIGH	40	34	4	2
SNOW	0	0	0	0
SUN_GLINT	0	0	0	0

Table 11: Calibration Image requests for this reporting period

Calibration image type	Total	Valid	Invalid
PROBA_V_L1A_CALIBRATION	2	1	1
PROBA-V_L1B_CALIBRATION	189	135	54
PROBA-V_L1B_INTERSECTION	773	347	426
PROBA-V_L1B_OVERLAPREGION	0	0	0

Table 12: Processed calibration images for this reporting period

(*) Due to insufficient overlap with the calibration region of interest, not enough pixels (e.g. clouds contamination), site not sufficiently uniform (illumination), etc.
Long-term monthly Libya-4 mean plots for different cameras are given in Figure 1 and Figure 2 and Figure 3. Deep convective clouds interband calibration results are given in Figure 4.

Similar as during last month the DCC calibration results show a sudden increase in the NIR band results of about 1.5%. This increase is also visible, also less pronounced, in the Libya-4 desert results and the lunar calibration results It is currently thought to be related to the significant increase in the instrument temperature from about -3° in October 2018 to 2° in January 2019 during the DCC observations.We are now evaluating possible actions that could be taken to reduce the impact.

The yaw maneuver data of summer 2018 have been fully analyzed; the results will be documented in a dedicated report.

Radiometric ICP file

The BLUE LEFT/CENTER absolute calibration coefficients will be updated following a linear degradation model. No updates will be performed for the SWIR strips. Furthermore the dark currents will be updated.

The current ICP files are

- PROBAV_ICP_RADIOMETRIC#LEFT_20190101_V01
- PROBAV_ICP_RADIOMETRIC#CENTER_20190101_V01
- PROBAV_ICP_RADIOMETRIC#RIGHT_20190101_V01

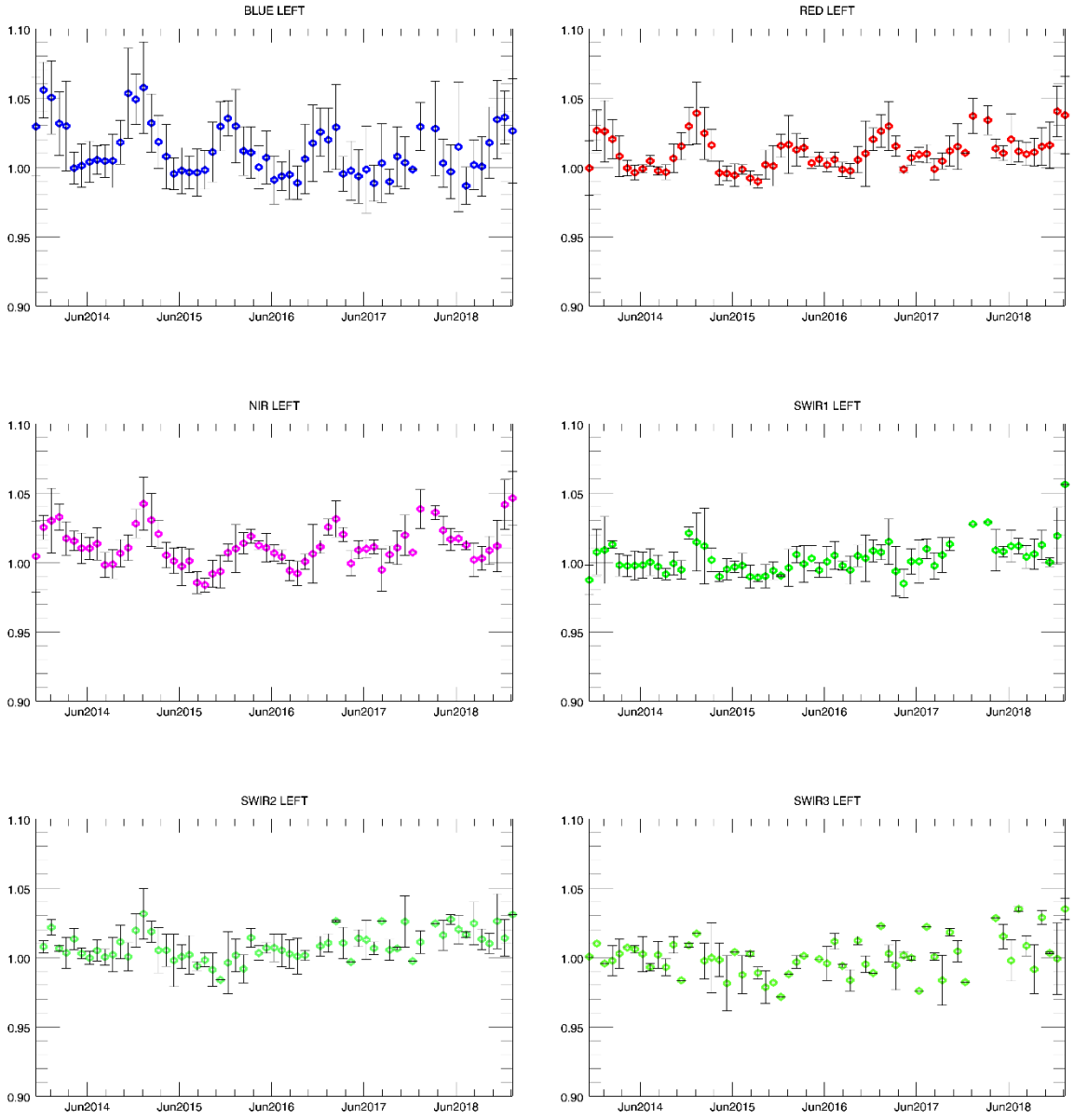

Figure 1. Libya-4 desert calibration results: LEFT monthly averaged results (collection 1)

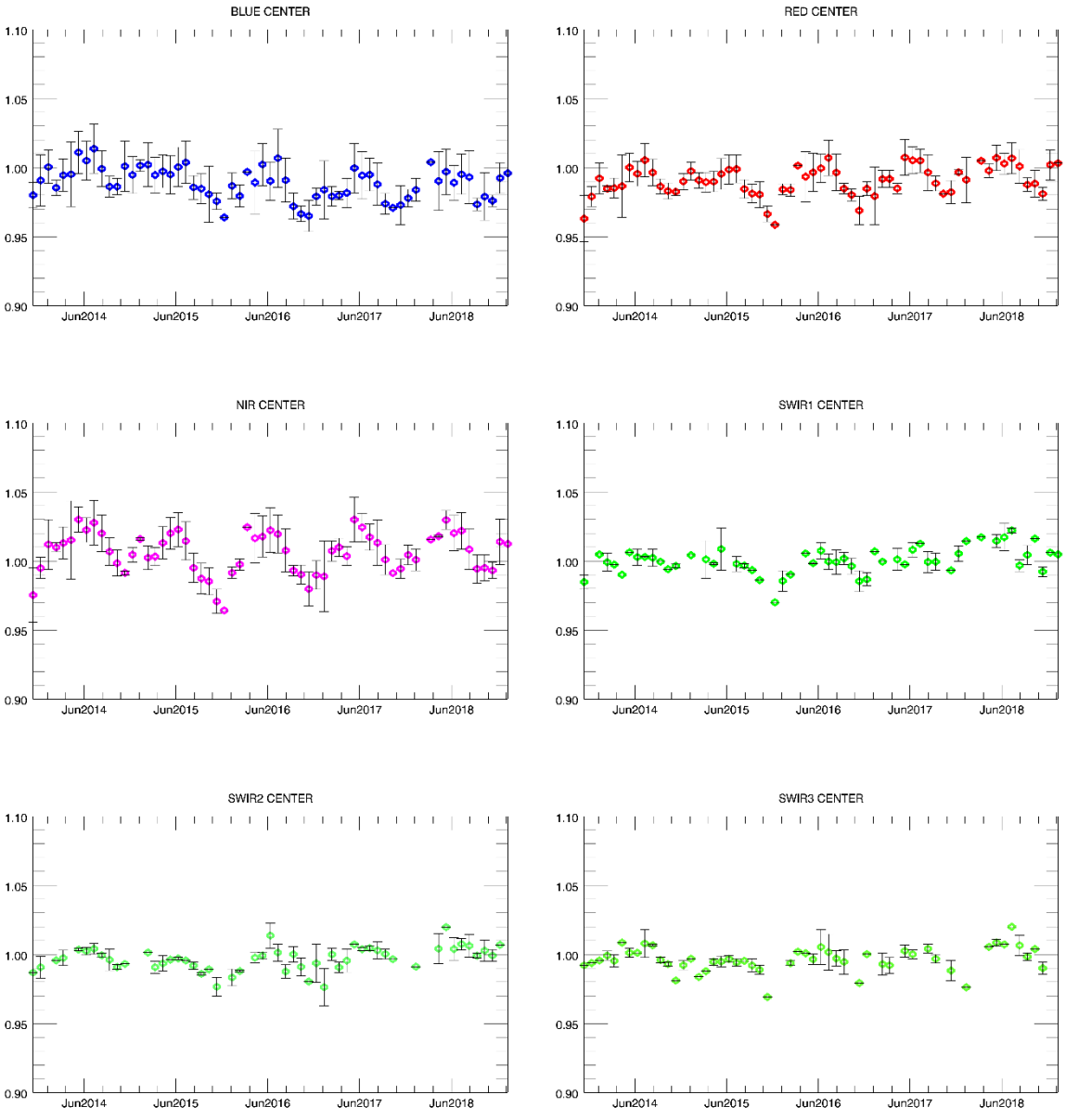

Figure 2. Libya-4 desert calibration results: CENTER monthly averaged results (collection 1)

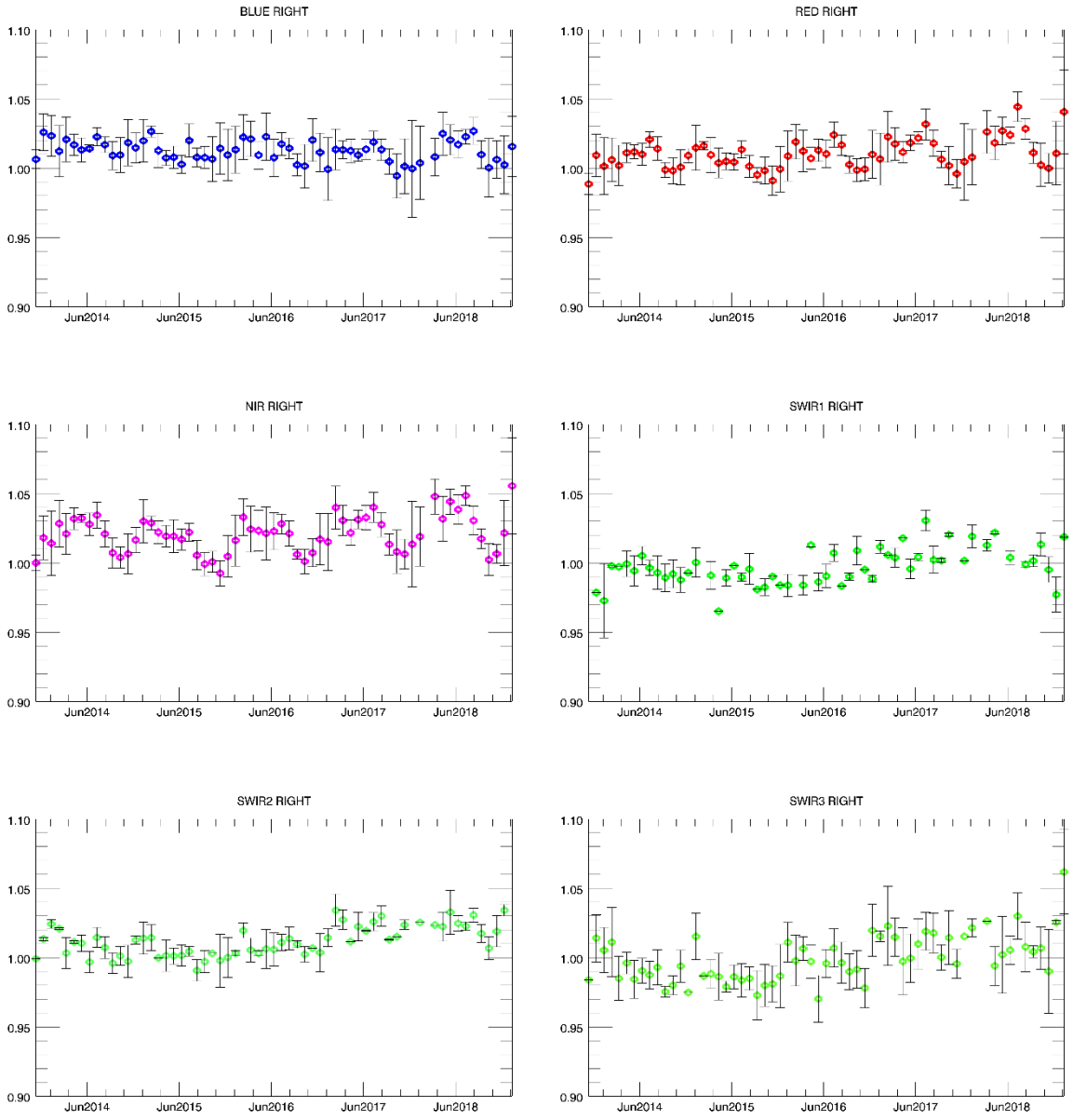

Figure 3. Libya-4 desert calibration results: RIGHT monthly averaged results (collection 1)

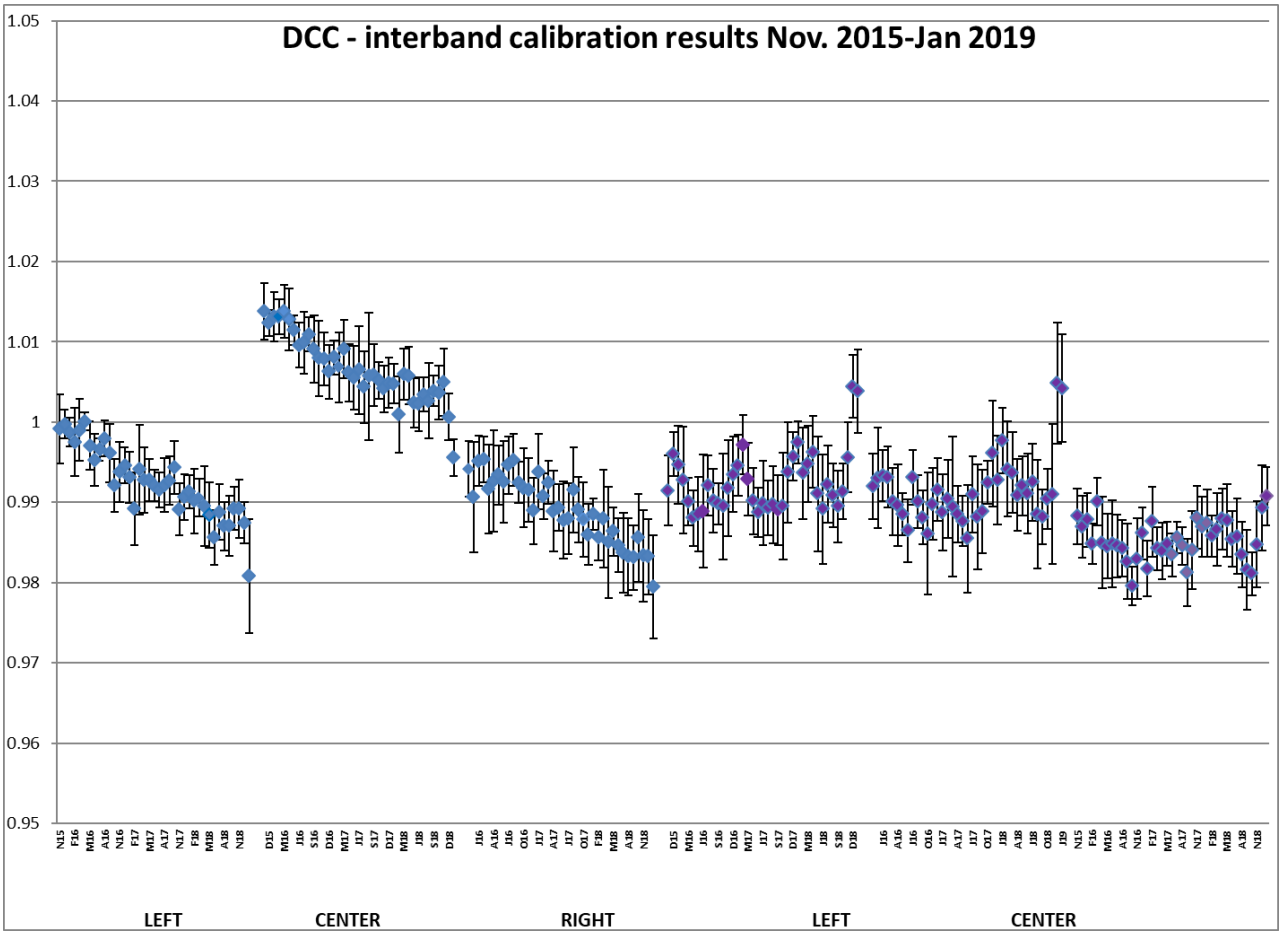

Figure 4. DCC inter-band calibration results: LEFT, CENTER and RIGHT camera (collection 1)

4.2. Geometric Calibration

Calibration image type	Total	Processed	Error
PROBA-V_L1C_INTERSECTION	12375	12375	0

Table13: Processed calibration images for this reporting period

During previous month, the average ALE was 78 m (σ < 97 m). Due to a platform issue, no ALE information for 25/12/2018 is available, while the values for 13/1 – 15/1 are not available due to processing issues.
From 16/12 – 24/12, the ALE was stable at 55 – 75 m. At 26/12, a maximum with values of 87 – 99 m occurred. This peak was followed by some alternations between maxima and minima, but all maximum values were generally below 90 m.

The average compliance was 99.1% (98.67 – 99.72% from BLUE – SWIR), with the lower compliance values coinciding with the ALE maxima.

Geometric ICP file

- PROBAV_ICP_GEOMETRIC#LEFT_20160907_V01
- PROBAV_ICP_GEOMETRIC#CENTER_20160907_V01
- PROBAV_ICP_GEOMETRIC#RIGHT_20160907_V01

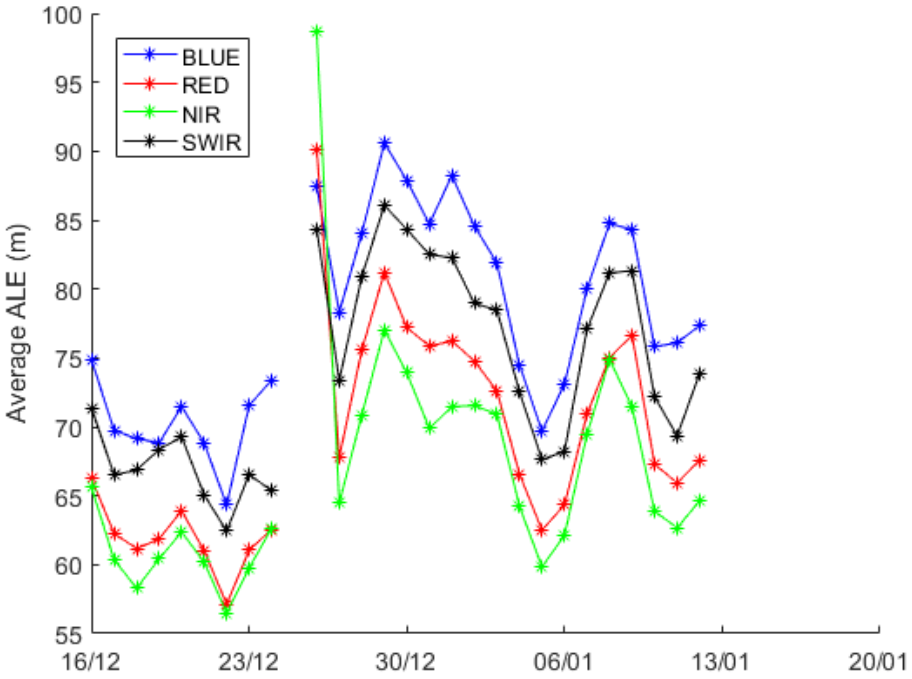

Figure 5 - Daily ALE evolution for 16/12/2018 – 15/01/2019

5. Anomalies

5.1. System related issues

A detailed description of each issue is available in the issue tracking system http://jira.vgt.vito.be

Key	Summary	Status	Created	Component/s
PROBAVUS-7	Very small images fail to process	Resolved	10/01/2014	General
PROBAVUS-63	Cloud shadow detection at high solar zenith angles not working properly	Open	11/05/2016	Software
PROBAVUS-65	Processing statuses L2 products	In Progress	16/09/2016	Software
PROBAVUS-66	Cloud cover percentages on PDF products are not reliable	Resolved	19/10/2016	Software

PROBAVUS-68	ICP file version not taken into account when processing	In Progress	20/03/2017	Software
PROBAVUS-69	Version number of segment not filtered when querying for syntheses	Open	20/03/2017	Software
PROBAVUS-70	Investigate L2A artefact in data	Open	31/05/2017	Software
PROBAVUS-72	Status mask of data with decompression error is not correctly set	Open	22/06/2017	Software
PROBAVUS-75	Clear pixel edge in cloud shadow detection	Open	15/11/2017	Software

0 new issues were logged during this reporting period
0 issues were resolved and closed during this reporting period
1 issue is resolved but remain to be closed formally
1 issue is resolved but remain in the list logging purposes
7 issue(s) is open and remain to be solved

5.2. Image processing issues

A detailed description of each issue is available in the Weekly Report and the image processing tracking system https://juniper.vgt.vito.be/ciptools

The below table gives an overview of the S1's of this reporting period:

	# S1	Dates
Major Gaps (> 21600 km² (missing TFF))	3	25/12, 24/12, 26/12
Large Gaps (< 21600 km²)	1	07/01
Medium Gaps (< 10000 km²)	3	31/12, 09/01, 16/12
Minor Gaps (< 3600 km²)	6	13/01, 20/12, 11/01, 01/01, 06/01, 02/01
Negligible Gaps (< 1000 km²)	18	28/12, 18/12, 23/12, 08/01, 03/01, 19/12, 29/12, 12/01, 05/01, 10/01, 30/12, 22/12, 17/12, 27/12, 14/01, 04/01, 15/01, 21/12
Complete synthesis (no gaps)	0	

Table14: Overview of S1 for this reporting period

Synthesis	Missing	Decom. Error	Geom. Error	Missing TFF	Autom. Recovery	VC4 Missing	Create Contours	Other
20181216	5.07%	11	10					1
20181217	0.23%	20	17					
20181218	0.57%	11	19					
20181219	1.11%	9	19					
20181220	3.62%	12	28		1			
20181221	0.20%	5	25					
20181222	0.69%	4	22					
20181223	1.57%	5	35				3	
20181224	17.90%	3	15	2	1			1
20181225	N/A			11				1
20181226	85.85%	4	3	5			38	
20181227	0.50%	4	19					
20181228	1.04%	4	25					
20181229	1.67%	3	24					
20181230	0.76%	5	29					
20181231	5.52%	8	37	1				1
20190101	4.51%	5	39		1			
20190102	3.86%	6	25		1		1	
20190103	1.75%	6	22					
20190104	1.76%	9	23			1		
20190105	0.81%	8	29					
20190106	2.89%	6	8		1		1	
20190107	2.81%	9	11		1	1	3	
20190108	0.09%	4	10					
20190109	2.88%	3	15		1		1	
20190110	1.23%	9	12					
20190111	3.45%	22	15			3		
20190112	2.21%	8	28					
20190113	2.13%	6	27		1		2	
20190114	1.52%	9	17					
20190115	2.28%	6	15		1			

Table 15: List of synthesis with an error overview of the missing percentages and errors for this reporting period

6. Scheduled activities for the next period(s)

- Software upgrades:
  No software upgrades planned

- Hardware:
  No hardware upgrades planned

- Development:
  No new developments planned

- No other activities scheduled.

7. Operational remarks

No operational remarks