



MONTHLY OPERATIONS REPORT

MOR#082

Reporting period from 16-Sep-2020 to 15-Oct-2020

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1. Summary

PROBA-V's operational lifetime ended on 30 June 2020. From July 1st onwards, the mission continues to exist with emphasis of acquiring the European and African continent until October 2021 and some experiments.

In this reporting period, all of the synthesis products were nearly complete. No missing transfer frame files were missing, and no automatic recoveries were recorded with impact on the products. The amount of decompression errors and geometric errors remained at a low acceptable level.

No major anomalies were recorded in the radiometric and geometric quality assessment.

The timeliness of the products is now on average 17h instead of 9h as there are no quality operators available throughout the weekends and public holidays.

Preparation of the development of collection 2 workflows are further implemented, with main focus on the new A/C algorithm and preparation of the new reprocessing environment.

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	240	240	0	240
TFF	90	90	0	90

Table 2: Ingested and archived products for this reporting period

3.2. Generated and archived products

Product Type	Total	Processed	Error	Archived
PROBAV_L1A - Calibration	266	266	0	266
PROBAV_L1A - Nominal	629	629	0	629
PROBAV_L1C	629	629	0	629
PROBAV_L2A_100M	225	225	0	225
PROBAV_L2A_300M	629	629	0	629
PROBAV_L2A_1KM	629	629	0	629
PROBAV_L3_S1_TOA_100M	30	30	0	30
PROBAV_L3_S1_TOC_100M	30	30	0	30
PROBAV_L3_S1_TOC_NDVI_100M	30	30	0	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	30	30	0	30
PROBAV_L3_S1_TOC_300M	30	30	0	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	30	30	0	30
PROBAV_L3_S1_TOC_1KM	30	30	0	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

3.3. Backup and archiving service

Product type	Total Files	Total File Size (GB)
TFF	87	254.37
L1A	858	454.71
Database transaction logs	824	42.79
Database incremental back-up	52	14.72
Database full back-up	8	418.81

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

Product type	Total Files	Total File Size (GB)
PROBAV_TRANSFERFRAMES	87	273.12
PROBAV_L1A	858	488.25
PROBAV_L1C	607	842.95
PROBAV_L2A_100M	367	321.73
PROBAV_L2A_300M	1021	176.18
PROBAV_L2A_1KM	1021	23.52
PROBAV_L3_S1_TOA_100M	49	354.54
PROBAV_L3_S1_TOC_100M	49	370.52
PROBAV_L3_S1_TOC_NDVI_100M	49	43.57
PROBAV_L3_S5_TOA_100M	10	279.13
PROBAV_L3_S5_TOC_100M	9	260.14
PROBAV_L3_S5_TOC_NDVI_100M	10	33.77
PROBAV_L3_S1_TOA_300M	49	170.26
PROBAV_L3_S1_TOC_300M	49	177.24
PROBAV_L3_S10_TOC_300M	5	30.76
PROBAV_L3_S10_TOC_NDVI_300M	5	2.66
PROBAV_L3_S1_TOA_1KM	49	23.09
PROBAV_L3_S1_TOC_1KM	49	23.83
PROBAV_L3_S10_TOC_1KM	5	4.14
PROBAV_L3_S10_TOC_NDVI_1KM	5	0.33
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	232	0.29
METEO_METEOSERVICES	232	1.24
POLARMOTION	3	0.00

Table 5: Archived data volumes for this reporting period

3.4. Dissemination service

Product type	Added to catalogue	Ordered	Delivered
PROBAV_L1C	632	1412	1412
PROBAV_L2A_100M	224	0	2
PROBAV_L2A_300M	632	0	1
PROBAV_L2A_1KM	632	0	0
PROBAV_L3_S1_TOA_100M	30	151	145
PROBAV_L3_S1_TOC_100M	30	1448	329
PROBAV_L3_S1_TOC_NDVI_100M	30	386	1
PROBAV_L3_S5_TOA_100M	6	0	0
PROBAV_L3_S5_TOC_100M	6	483	515
PROBAV_L3_S5_TOC_NDVI_100M	6	7	7
PROBAV_L3_S1_TOA_300M	30	162	162
PROBAV_L3_S1_TOC_300M	30	73	146
PROBAV_L3_S10_TOC_300M	3	639	638
PROBAV_L3_S10_TOC_NDVI_300M	3	233	273
PROBAV_L3_S1_TOA_1KM	30	61	62
PROBAV_L3_S1_TOC_1KM	30	434	483
PROBAV_L3_S10_TOC_1KM	3	442	442
PROBAV_L3_S10_TOC_NDVI_1KM	3	43	126

Table 6: Ordered and delivered products for this reporting period

3.5. End-user activity

8 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 **1857** with **122** different nationalities representing **1347** different companies/universities.

Product type	Africa	Asia	Europe	N-America	Oceania	S-America
PROBAV_L1C	0	0	1547.64	0	0	0
PROBAV_L2A_100M	0	2.00	0	0	0	0
PROBAV_L2A_300M	0	0	0.13	0	0	0
PROBAV_L2A_1KM	0	0	0	0	0	0
PROBAV_L3_S1_TOA_100M	0	367.53	1366.71	0	0	0
PROBAV_L3_S1_TOC_100M	0	0.05	1881.43	194.99	0	0
PROBAV_L3_S1_TOC_NDVI_100M	0.01	0	0	0	0	0
PROBAV_L3_S5_TOA_100M	0	0	0	0	0	0
PROBAV_L3_S5_TOC_100M	21.44	0.06	25.82	0	0	0
PROBAV_L3_S5_TOC_NDVI_100M	0	0.99	0	0	0	0
PROBAV_L3_S1_TOA_300M	0	0	181.92	0	0	1024.68
PROBAV_L3_S1_TOC_300M	0	0	261.55	94.79	0	0
PROBAV_L3_S10_TOC_300M	2.66	37.40	36.61	0	0	0
PROBAV_L3_S10_TOC_NDVI_300M	0	1.54	9.83	0	0	0
PROBAV_L3_S1_TOA_1KM	0	0.00	26.68	0	0	0
PROBAV_L3_S1_TOC_1KM	0	557.99	38.85	0	0	0
PROBAV_L3_S10_TOC_1KM	0.87	2.71	2.50	0	0	0
PROBAV_L3_S10_TOC_NDVI_1KM	0.08	0.07	0	0	0	0

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

Product Type	Global
L1C	1547.64
PROBAV_L2A_100M	2.00
PROBAV_L2A_300M	0.13
PROBAV_L2A_1KM	0
PROBAV_L3_S1_TOA_100M	1734.23
PROBAV_L3_S1_TOC_100M	2076.47
PROBAV_L3_S1_TOC_NDVI_100M	0.01
PROBAV_L3_S5_TOA_100M	0
PROBAV_L3_S5_TOC_100M	47.33
PROBAV_L3_S5_TOC_NDVI_100M	0.99
PROBAV_L3_S1_TOA_300M	1206.60
PROBAV_L3_S1_TOC_300M	356.34
PROBAV_L3_S10_TOC_300M	76.68
PROBAV_L3_S10_TOC_NDVI_300M	11.37
PROBAV_L3_S1_TOA_1KM	26.68
PROBAV_L3_S1_TOC_1KM	596.84
PROBAV_L3_S10_TOC_1KM	6.08
PROBAV_L3_S10_TOC_NDVI_1KM	0.15

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

Company	# Downloads
EOSENSE	1389
IGSNRR	868
-	473
CAS	366
UPMC	343
VITO	275
ESA	153
DESCARTES UNDERWRITING	123
UCLOUVAIN	114
ICMBIO	102

Table 9: Top 10 user companies for the reporting period

Country	# Users
CHINA	192
BELGIUM	164
INDIA	88
FRANCE	86
BRAZIL	84
UNITED STATES	80
ITALY	77
NETHERLANDS	63
UNITED KINGDOM	61
GERMANY	57

Table 10: Top 10 countries with most registered users

List of issues raised by users:

- ProbaV Feedback
I don't need my MEP account anymore
PDF: PROBA-V 100 M products - S1 TOC 100 m [C1] - swinnene - 2020/9/28 - order no. M0186442
read permissions on hspf_acc jobs

4. Image Calibration services

4.1. Radiometric Calibration

Calibration request type	Total	Processed	Not received	Error
CLOUDS	51	35	16	0
DARK CURRENT	28	20	8	0
MOON	2	2	0	0
RAYLEIGH	60	43	17	0
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	0	2
PROBA-V_L1B_CALIBRATION	264	204	60
PROBA-V_L1B_INTERSECTION	708	439	269
PROBA-V_L1B_OVERLAPREGION	0	0	0

Table 12: Processed calibration images for this reporting period

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.

While in previous months all bands of the RIGHT camera have shown a significant positive trend, a sudden drop in the Libya-4 calibration results is observed for the current month. The cause of this sudden drop is unclear. This drop is not observed for the the LEFT camera where an increasing trend in the RED and NIR band Libya-4 calibration results remain visible.

No new bad pixels were identified. A clear stripe is visible at pixel ID496 in the Right SWIR3 strip. It will be evaluated if by the foreseen dark current update the stripe will be removed.

Radiometric ICP file

The BLUE LEFT/CENTER absolute calibration coefficients will be updated following a linear degradation model. Furthermore the dark currents will be updated.

The current ICP files are

- PROBAV_ICP_RADIOMETRIC#LEFT_20201001_V01
- PROBAV_ICP_RADIOMETRIC#CENTER_20201001_V01
- PROBAV_ICP_RADIOMETRIC#RIGHT_20201001_V01

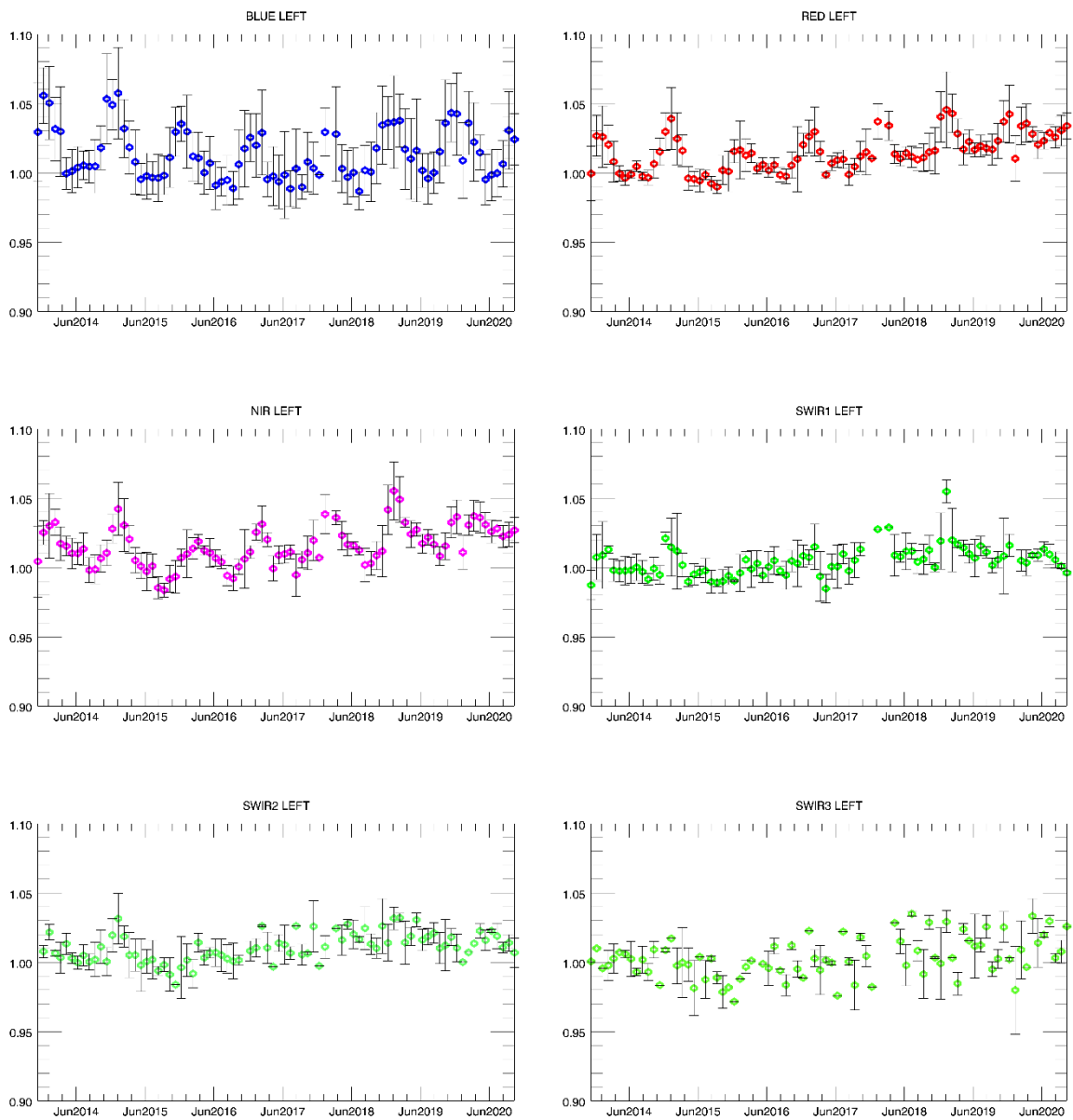


Figure 1. Libya-4 desert calibration results: LEFT monthly averaged results (collection 1)

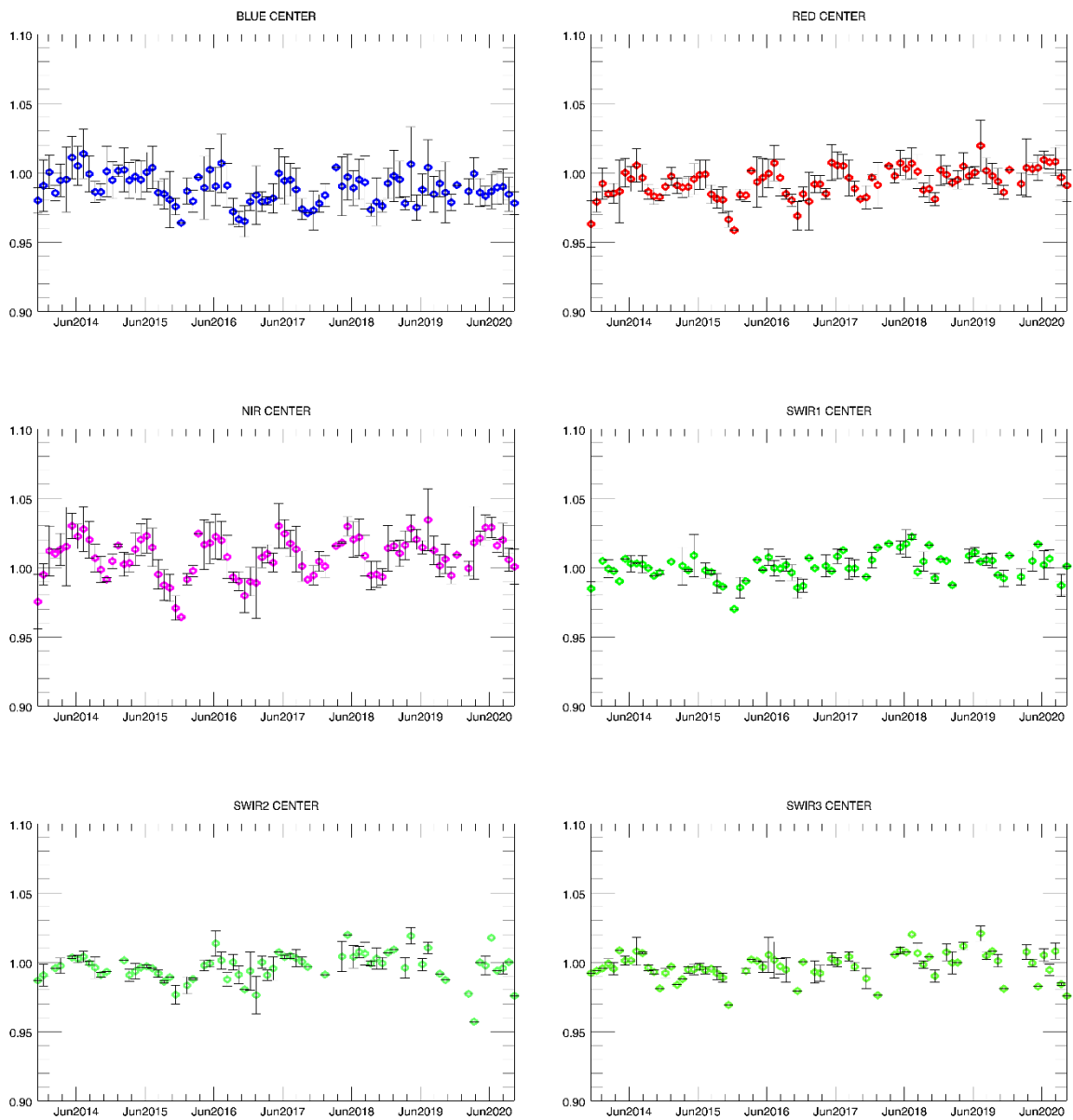


Figure 2. Libya-4 desert calibration results: CENTER monthly averaged results (collection 1)

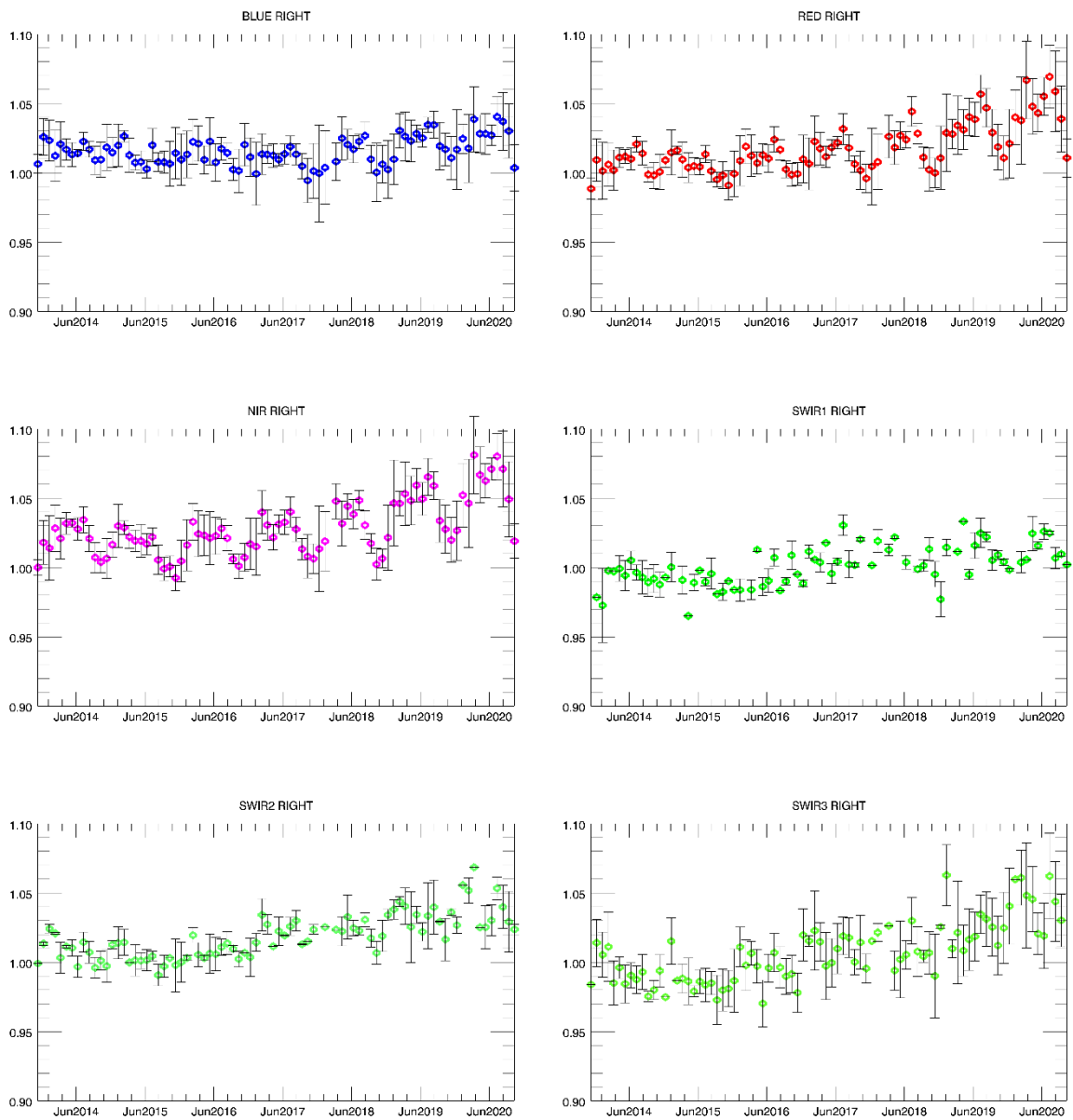


Figure 3. Libya-4 desert calibration results: RIGHT monthly averaged results (collection 1)

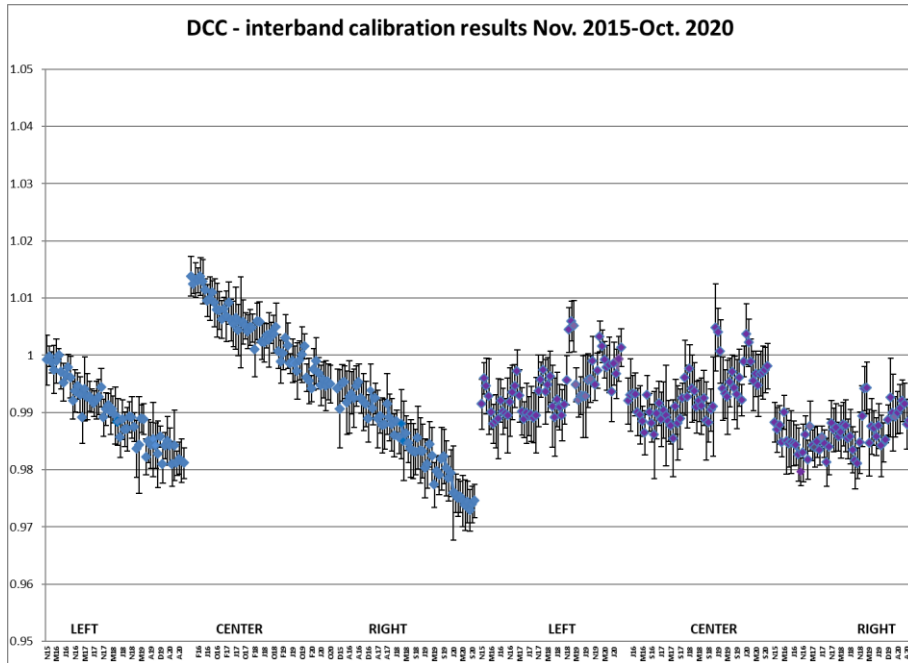


Figure 4. DCC inter-band calibration results: LEFT, CENTER and RIGHT camera (collection 1)

4.2. Geometric Calibration

Calibration image type	Total	Processed	Error
PROBA-V_L1C_INTERSECTION	4140	4140	0

Table13: Processed calibration images for this reporting period

During previous month, the average ALE was < 70 m ($\sigma < 93$ m). Daily values were generally 50 - 70 m, but on 23/9 a peak with values of 75 - 86 m occurred. The average compliance was 99.22% (98.79% - 99.67% for BLUE - SWIR).

Geometric ICP file

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

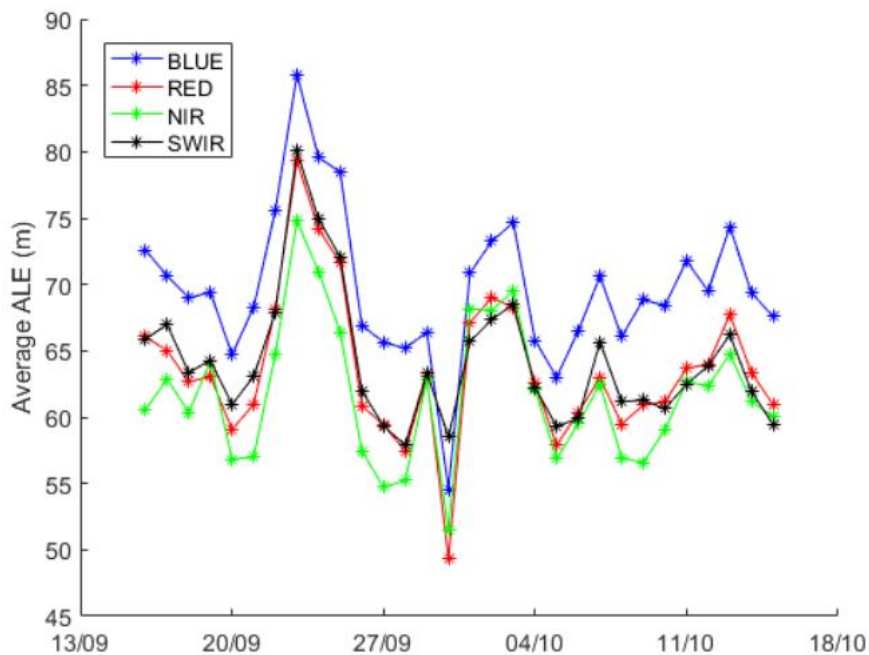


Figure 5: Daily ALE evolution for 16/9 - 15/10/2020.

5. Anomalies

5.1. 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))	0	
Large Gaps (< 21600 km²)	0	
Medium Gaps (< 10000 km²)	0	
Minor Gaps (< 3600 km²)	1	10/10
Negligible Gaps (< 1000 km²)	21	03/10, 28/09, 08/10, 13/10, 29/09, 04/10, 24/09, 09/10, 11/10, 26/09, 01/10, 06/10, 05/10, 15/10, 20/09, 30/09, 25/09, 12/10, 02/10, 07/10, 22/09
Complete synthesis (no gaps)	8	18/09, 23/09, 21/09, 17/09, 27/09, 16/09, 19/09, 14/10

Table14: Overview of S1 for this reporting period

Synthesis	Missing ^(*)	Decom. Error	Geom. Error	Missing TFF	Autom. Recovery	VC4 Missing	Create Contours	Other
20200916	65.91%							
20200917	64.48%							
20200918	66.20%							
20200919	65.90%							
20200920	66.25%	2						
20200921	65.44%							
20200922	65.95%		2					
20200923	66.06%	1						
20200924	66.06%	2						
20200925	65.96%							
20200926	64.57%	4						
20200927	66.21%							
20200928	65.96%	3	1					
20200929	66.26%	2						
20200930	65.55%	1	1					
20201001	65.70%		3					
20201002	65.90%	1						
20201003	65.89%	1	3					
20201004	65.91%		2					
20201005	64.53%	3						
20201006	66.11%	2						
20201007	66.47%	2	3					
20201008	66.26%	3	9					
20201009	65.50%	1						
20201010	65.96%	4	3			1		
20201011	65.47%	2						
20201012	64.80%	2	4					
20201013	64.88%	1						
20201014	63.65%							
20201015	65.31%	1						

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

(*) Missing % of pixels are still calculated on a global basis. This requires a development and will be corrected in the upcoming reprocessing campaign.

6. Scheduled activities for the next period(s)

- Software upgrades:
No software upgrades planned
- Hardware:
No hardware upgrades planned
- Development:
Preparation of the C2 collection workflow is ongoing, in particular with focus on the A/C module.
- No other activities scheduled.

7. Operational remarks

No operational remarks