



MONTHLY OPERATIONS REPORT

MOR#083

Reporting period from 16-Oct-2020 to 15-Nov-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. 7 new users registered and downloaded data in this period.

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	248	248	0	248
TFF	95	95	0	95

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	247	247	0	247
PROBAV_L1A - Nominal	643	641	2 ^(*)	643
PROBAV_L1C	641	641	0	641
PROBAV_L2A_100M	225	225	0	225
PROBAV_L2A_300M	641	641	0	641
PROBAV_L2A_1KM	641	641	0	641
PROBAV_L3_S1_TOA_100M	31	31	0	31
PROBAV_L3_S1_TOC_100M	31	31	0	31
PROBAV_L3_S1_TOC_NDVI_100M	31	31	0	31
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	31	0	31
PROBAV_L3_S1_TOC_300M	31	31	0	31
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	31	0	31
PROBAV_L3_S1_TOC_1KM	31	31	0	31
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

(*) 2 x L1A error due geometric processing

3.3. Backup and archiving service

Product type	Total Files	Total File Size (GB)
TFF	92	262.43
L1A	860	465.24
Database transaction logs	768	42.64
Database incremental back-up	38	13.92
Database full back-up	14	714.48

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

Product type	Total Files	Total File Size (GB)
PROBAV_TRANSFERFRAMES	83	255.05
PROBAV_L1A	773	450.64
PROBAV_L1C	560	777.63
PROBAV_L2A_100M	198	158.93
PROBAV_L2A_300M	560	88.85
PROBAV_L2A_1KM	560	12.61
PROBAV_L3_S1_TOA_100M	26	169.20
PROBAV_L3_S1_TOC_100M	26	162.13
PROBAV_L3_S1_TOC_NDVI_100M	26	19.26
PROBAV_L3_S5_TOA_100M	6	160.63
PROBAV_L3_S5_TOC_100M	5	134.98
PROBAV_L3_S5_TOC_NDVI_100M	5	14.91
PROBAV_L3_S1_TOA_300M	26	84.53
PROBAV_L3_S1_TOC_300M	26	81.28
PROBAV_L3_S10_TOC_300M	2	12.95
PROBAV_L3_S10_TOC_NDVI_300M	2	1.00
PROBAV_L3_S1_TOA_1KM	26	12.34
PROBAV_L3_S1_TOC_1KM	26	11.90
PROBAV_L3_S10_TOC_1KM	2	1.77
PROBAV_L3_S10_TOC_NDVI_1KM	2	0.13
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	216	0.27
METEO_METEOSERVICES	216	1.15
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	638	2013	2014
PROBAV_L2A_100M	224	0	3
PROBAV_L2A_300M	638	0	0
PROBAV_L2A_1KM	638	2	5
PROBAV_L3_S1_TOA_100M	30	126	121
PROBAV_L3_S1_TOC_100M	30	137	187
PROBAV_L3_S1_TOC_NDVI_100M	30	0	1
PROBAV_L3_S5_TOA_100M	5	44	37
PROBAV_L3_S5_TOC_100M	6	74	73
PROBAV_L3_S5_TOC_NDVI_100M	6	7	9
PROBAV_L3_S1_TOA_300M	30	205	210
PROBAV_L3_S1_TOC_300M	30	60	127
PROBAV_L3_S10_TOC_300M	3	239	239
PROBAV_L3_S10_TOC_NDVI_300M	3	0	313
PROBAV_L3_S1_TOA_1KM	30	60	61
PROBAV_L3_S1_TOC_1KM	30	60	112
PROBAV_L3_S10_TOC_1KM	3	6	6
PROBAV_L3_S10_TOC_NDVI_1KM	3	761	761

Table 6: Ordered and delivered products for this reporting period

3.5. End-user activity

7 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 **1869** with **122** different nationalities representing **1355** different companies/universities.

Product type	Africa	Asia	Europe	N-America	Oceania	S-America
PROBAV_L1C	0	0	2184.68	29.58	0	0
PROBAV_L2A_100M	0	0	2.65	0	0	0
PROBAV_L2A_300M	0	0	0	0	0	0
PROBAV_L2A_1KM	0	0	0.16	0.06	0	0
PROBAV_L3_S1_TOA_100M	0	220.19	1422.87	0	0	0
PROBAV_L3_S1_TOC_100M	0	13.30	1846.81	195.54	0	0
PROBAV_L3_S1_TOC_NDVI_100M	0	0	0	0.04	0	0
PROBAV_L3_S5_TOA_100M	2.66	0.09	0	0	0	0
PROBAV_L3_S5_TOC_100M	20.69	747.65	0.30	0	0	0
PROBAV_L3_S5_TOC_NDVI_100M	0.61	0	0	0.13	0	0
PROBAV_L3_S1_TOA_300M	0	0	181.84	0	0	1505.89
PROBAV_L3_S1_TOC_300M	0	0	239.54	95.92	0	0
PROBAV_L3_S10_TOC_300M	1.52	10.55	35.58	0	0	0
PROBAV_L3_S10_TOC_NDVI_300M	0	0	17.16	0	0	0
PROBAV_L3_S1_TOA_1KM	0.00	0	26.48	0	0	0
PROBAV_L3_S1_TOC_1KM	0	0	35.80	0	0	0
PROBAV_L3_S10_TOC_1KM	0.61	0	2.44	0	0	0
PROBAV_L3_S10_TOC_NDVI_1KM	51.67	7.97	0	0	0	0

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

Product Type	Global
L1C	2214.26
PROBAV_L2A_100M	2.65
PROBAV_L2A_300M	0
PROBAV_L2A_1KM	0.22
PROBAV_L3_S1_TOA_100M	1643.06
PROBAV_L3_S1_TOC_100M	2055.65
PROBAV_L3_S1_TOC_NDVI_100M	0.04
PROBAV_L3_S5_TOA_100M	2.76
PROBAV_L3_S5_TOC_100M	768.64
PROBAV_L3_S5_TOC_NDVI_100M	0.73
PROBAV_L3_S1_TOA_300M	1687.73
PROBAV_L3_S1_TOC_300M	335.46
PROBAV_L3_S10_TOC_300M	47.65
PROBAV_L3_S10_TOC_NDVI_300M	17.16
PROBAV_L3_S1_TOA_1KM	26.48
PROBAV_L3_S1_TOC_1KM	35.80
PROBAV_L3_S10_TOC_1KM	3.05
PROBAV_L3_S10_TOC_NDVI_1KM	59.64

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

Company	# Downloads
EOSENSE	1996
ETHIOPIAN INSTITUTE OF AGRICULTURAL RESEARCH	478
JOINT RESEARCH CENTRE	313
YUNNAN NORMAL UNIVERSITY	255
IGSNRR	225
ESA	153
ICMBIO	145
VITO	133
DESCARTES UNDERWRITING	123
UCLouvain	121

Table 9: Top 10 user companies for the reporting period

Country	# Users
CHINA	196
BELGIUM	164
INDIA	88
FRANCE	87
BRAZIL	84
UNITED STATES	82
ITALY	77
NETHERLANDS	63
UNITED KINGDOM	61
GERMANY	57

Table 10: Top 10 countries with most registered users

List of issues raised by users:

Due to circumstances, the list of helpdesk tickets cannot be showed this month and will be added to the next monthly report.

4. Image Calibration services

4.1. Radiometric Calibration

Calibration request type	Total	Processed	Not received	Error
CLOUDS	42	25	17	0
DARK CURRENT	20	11	9	0
MOON	28	12	16	0
RAYLEIGH	69	39	30	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	13	12	1
PROBA-V_L1B_CALIBRATION	234	187	40
PROBA-V_L1B_INTERSECTION	715	414	301
PROBA-V_L1B_OVERLAPREGION	114	94	6

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.

In previous report a sudden drop in the Libya-4 calibration results for the RIGHT camera were observed compared to the significant positive trend which was being observed over the last year. Also in the latest calibration results this drop is observed. Overall the seasonal variations in the Libya-4 results for the RIGHT camera have significantly increased over the last 2 years. This might be partly attributed to BRDF related changes due to the orbital drift.

1 new bad pixel was identified in RIGHT SWIR3 strip: Pixel ID 496 (0-based).

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 and one bad pixel will be added (ie. pixel ID496 in the Right SWIR3 strip).

The current ICP files are:

- PROBAV_ICP_RADIOMETRIC#LEFT_20201101_V01
- PROBAV_ICP_RADIOMETRIC#CENTER_20201101_V01
- PROBAV_ICP_RADIOMETRIC#RIGHT_20201101_V01

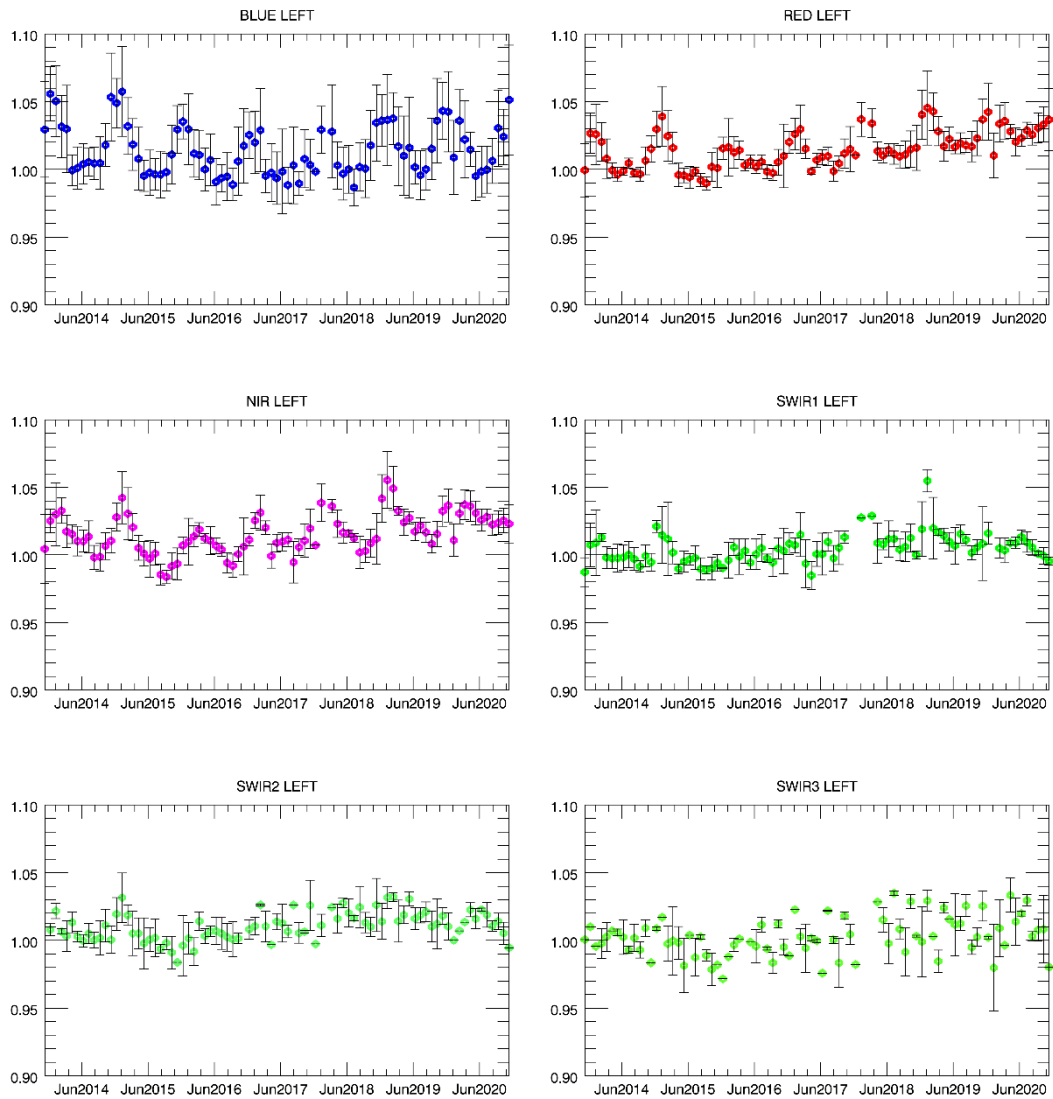


Figure 1. Libya-4 desert calibration results: LEFT monthly averaged results (collection 1)

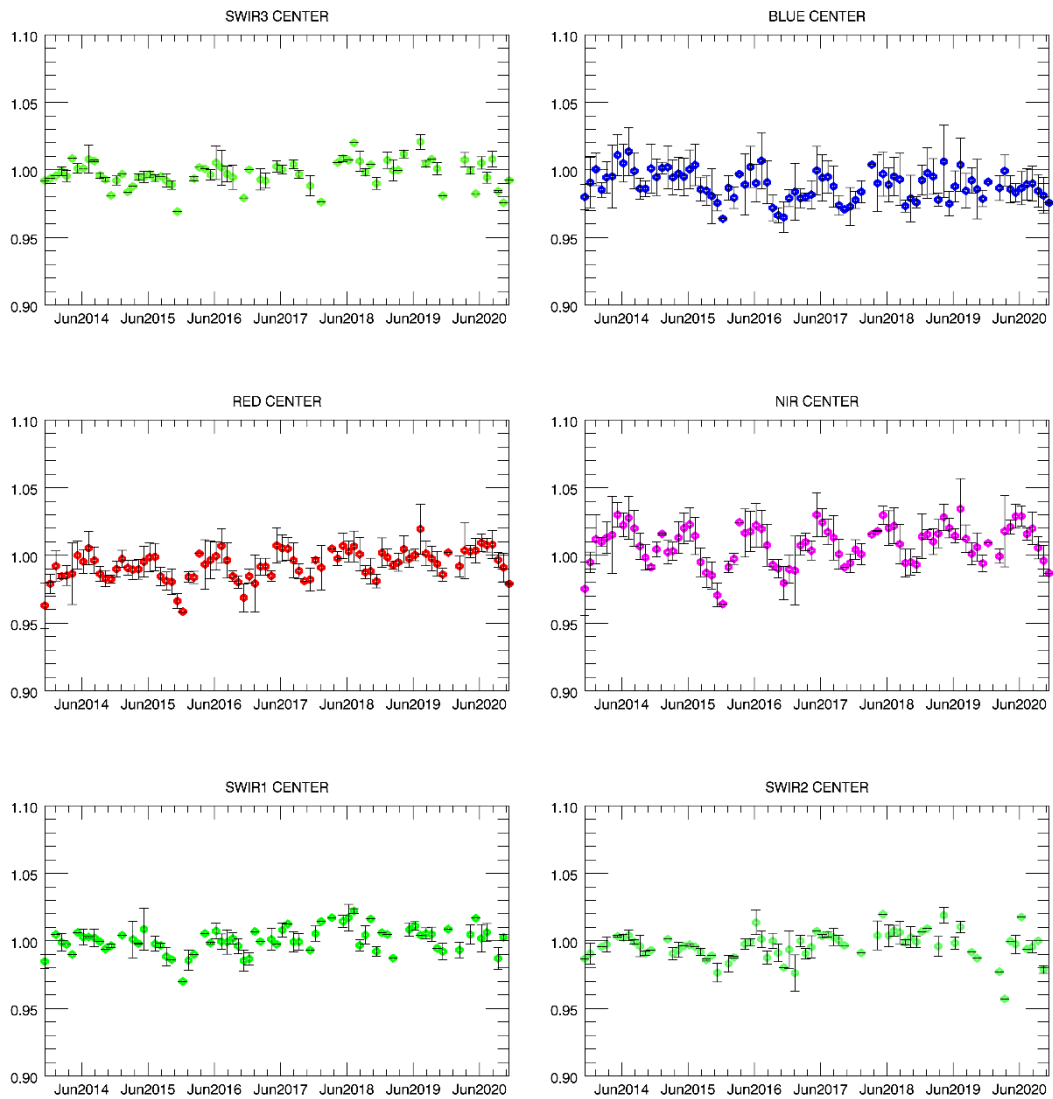


Figure 2. Libya-4 desert calibration results: CENTER monthly averaged results (collection 1)

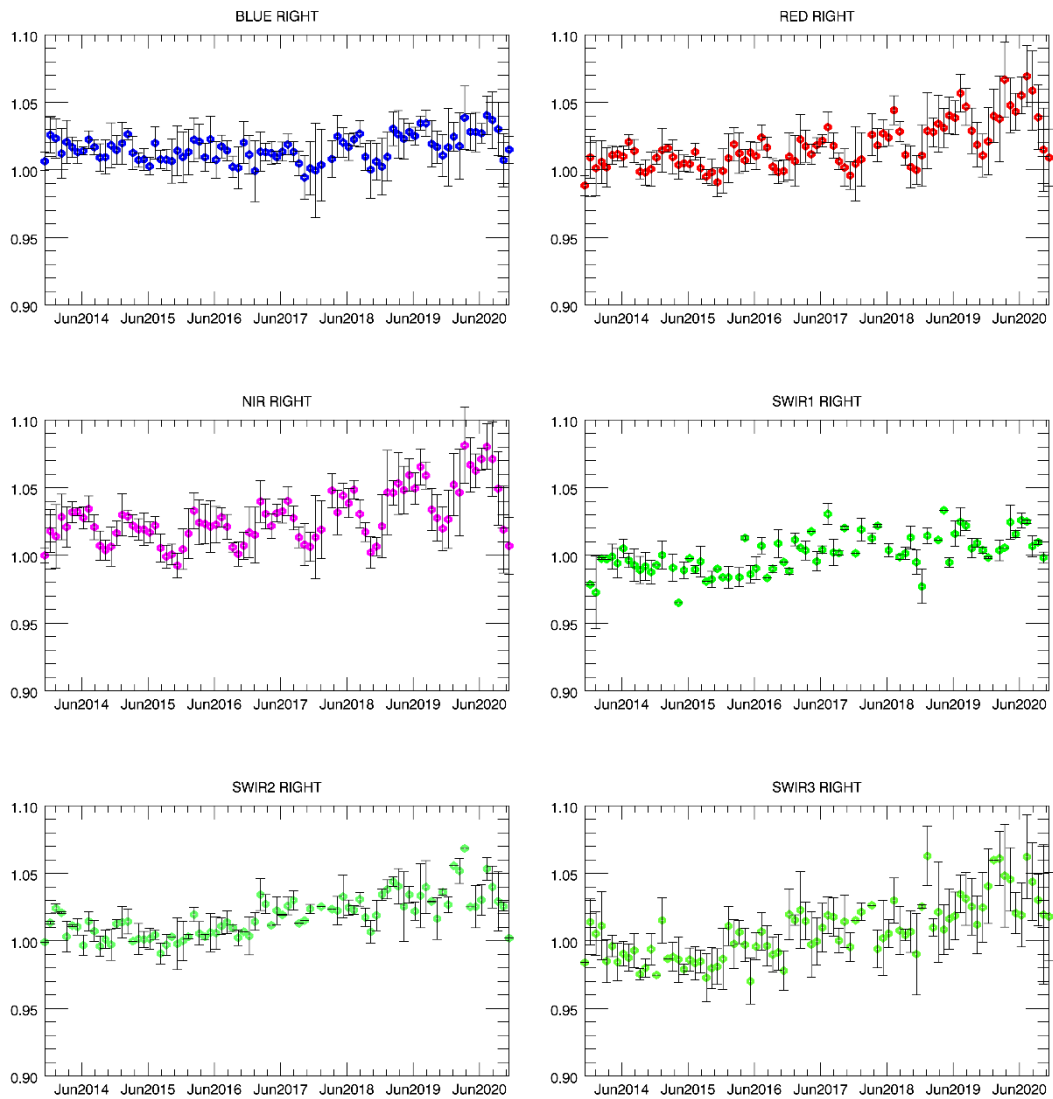


Figure 3. Libya-4 desert calibration results: RIGHT monthly averaged results (collection 1)

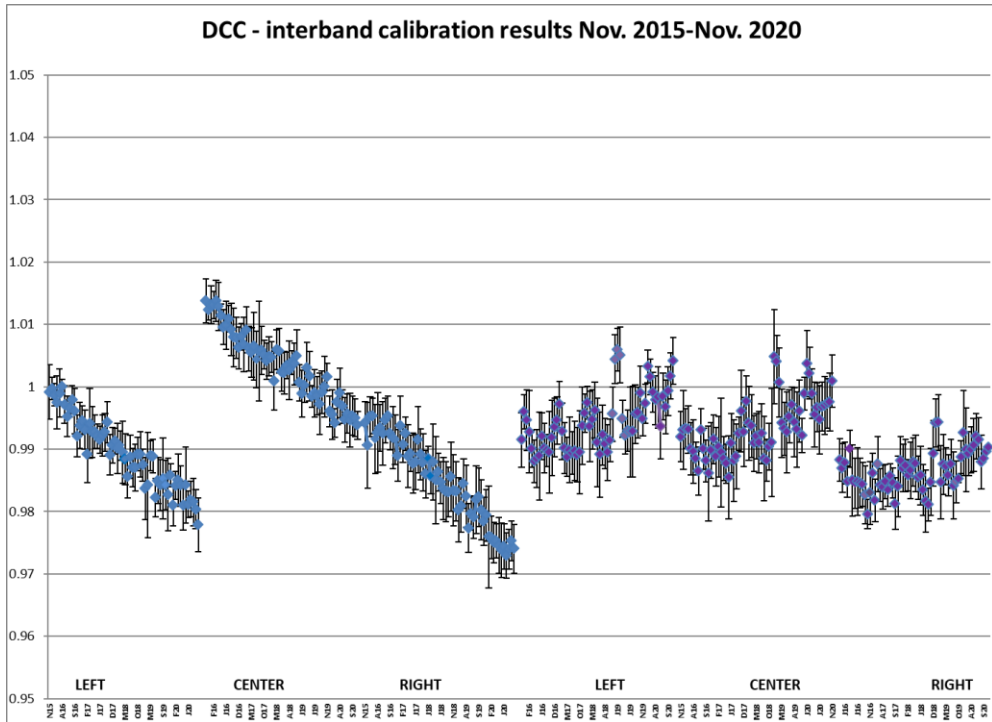


Figure 4. DCC inter-band calibration results: LEFT, CENTER and RIGHT camera (collection 1)

4.2. Geometric Calibration

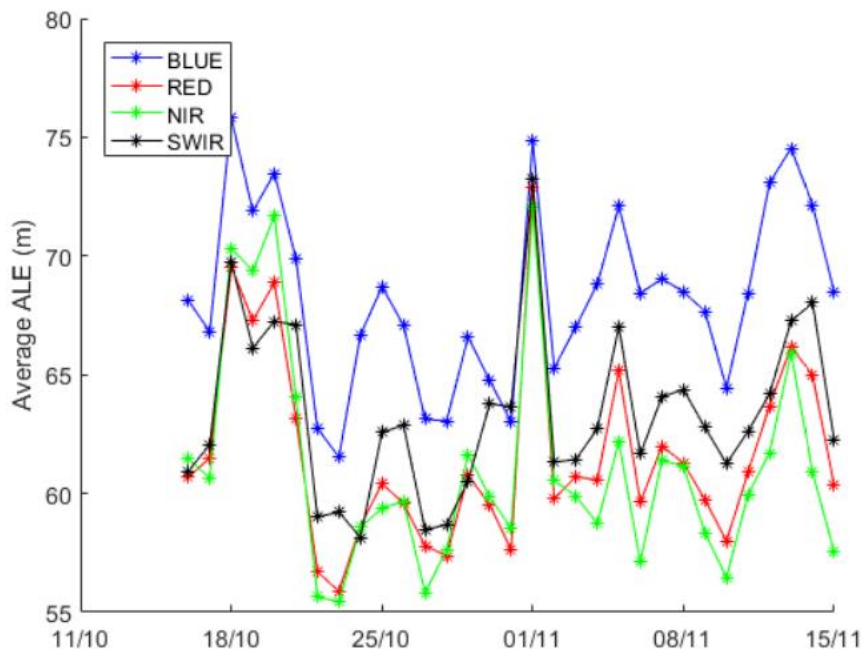
Calibration image type	Total	Processed	Error
PROBA-V_L1C_INTERSECTION	4138	4138	0

Table 13: Processed calibration images for this reporting period

During the reporting period, the average ALE was < 69 m ($\sigma < 93$ m). There were no major ALE maxima, the highest values occurred on 18/10 (70 – 76 m for SWIR – BLUE). The average compliance was 99.20% (98.72% – 99.65% from BLUE – SWIR), the minimum values were 98.16% - 99.47% (BLUE – SWIR).

Geometric ICP file

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



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))	1	03/11
Large Gaps (< 21600 km²)	0	
Medium Gaps (< 10000 km²)	3	06/11, 26/10, 13/11
Minor Gaps (< 3600 km²)	0	
Negligible Gaps (< 1000 km²)	25	29/10, 08/11, 05/11, 10/11, 15/11, 19/10, 24/10, 25/10, 20/10, 27/10, 01/11, 11/11, 17/10, 22/10, 04/11, 09/11, 30/10, 14/11, 18/10, 23/10, 21/10, 16/10, 07/11, 02/11, 28/10
Complete synthesis (no gaps)	2	31/10, 12/11

Table 14: Overview of S1 for this reporting period

Synthesis	Missing	Decom. Error	Geom. Error	Missing TFF	Autom. Recovery	VC4 Missing	Create Contours	Other
20201016	65.23%	1						
20201017	65.43%	3						
20201018	65.02%		3					
20201019	65.10%	1	1					
20201020	65.71%	4						
20201021	63.30%	3	2					
20201022	63.54%	3						
20201023	62.47%	3						
20201024	63.84%	1						
20201025	64.09%	1						
20201026	69.26%							1
20201027	64.15%	4						
20201028	63.98%	1	3					
20201029	64.85%		2					
20201030	64.57%	3						
20201031	65.14%							
20201101	61.51%	2	3					1
20201102	62.31%		4					
20201103	71.89%	2	5					
20201104	62.90%		2					
20201105	62.98%	5	10					
20201106	62.85%	6	9			2		
20201107	62.81%	2	7					
20201108	62.68%	2						
20201109	63.45%		1					
20201110	62.63%	1	1					
20201111	61.84%	1						
20201112	61.98%	1						
20201113	72.85%	2				1		
20201114	62.29%	2						
20201115	61.45%	4						

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:
Preparation for the Collection 2 are ongoing, with focus on the new atmospheric correction integration and update to the Cloud Optimized GeoTIFF format.
- No other activities scheduled.

7. Operational remarks

No operational remarks