



# MONTHLY OPERATIONS REPORT

**MOR#094**

**Reporting period from 16-Sep-2021 to 15-Oct-2021**

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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. However, three missing transfer frame files were reported. Only two automatic recoveries were recorded with limited 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.

The Collection 2 reprocessing activity is ongoing in phase 2 with processing 1 year of data (July 2018 – June 2019). This year will be thoroughly validated before the entire archive will be reprocessed.

A news item reconfirming the end of the PROBA-V mission on October 31<sup>st</sup> was spread on 21 of October.

## 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	237
TFF	90	87	3 <sup>(*)</sup>	87

*Table 2: Ingested and archived products for this reporting period*

(\*)TFF 26187: Transaction has no content;  
TFF 26214: wrong configuration;  
TFF 26229: no VC4 data available.

### 3.2. Generated and archived products

Product Type	Total	Processed	Error	Archived
PROBAV_L1A - Calibration	266	266	0	266
PROBAV_L1A - Nominal	600	598	2 <sup>(*)</sup>	600
PROBAV_L1C	598	598	0	598
PROBAV_L2A_100M	212	212	0	212
PROBAV_L2A_300M	598	598	0	598
PROBAV_L2A_1KM	598	598	0	598
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

(\*) 2 \* L1A error due geometric processing

### 3.3. Backup and archiving service

Product type	Total Files	Total File Size (GB)
TFF	87	250.0
L1A	836	450.14
Database transaction logs	577	30.97
Database incremental back-up	32	6.0
Database full back-up	6	450.38

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

Product type	Total Files	Total File Size (GB)
PROBAV_TRANSFERFRAMES	81	257.85
PROBAV_L1A	797	464.08
PROBAV_L1C	557	810.20
PROBAV_L2A_100M	389	374.47
PROBAV_L2A_300M	1112	204.53
PROBAV_L2A_1KM	1112	26.70
PROBAV_L3_S1_TOA_100M	56	403.69
PROBAV_L3_S1_TOC_100M	56	420.80
PROBAV_L3_S1_TOC_NDVI_100M	55	47.97
PROBAV_L3_S5_TOA_100M	12	340.28
PROBAV_L3_S5_TOC_100M	12	355.30
PROBAV_L3_S5_TOC_NDVI_100M	12	40.60
PROBAV_L3_S1_TOA_300M	56	193.39
PROBAV_L3_S1_TOC_300M	55	196.63
PROBAV_L3_S10_TOC_300M	6	35.65
PROBAV_L3_S10_TOC_NDVI_300M	6	3.22
PROBAV_L3_S1_TOA_1KM	56	25.58
PROBAV_L3_S1_TOC_1KM	56	26.15
PROBAV_L3_S10_TOC_1KM	6	4.72
PROBAV_L3_S10_TOC_NDVI_1KM	6	0.40
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	221	1.18
POLARMOTION	2	0.00

Table 5: Archived data volumes for this reporting period

### 3.4. Dissemination service

Product type	Added to catalogue	Ordered	Delivered
PROBAV_L1C	593	128	132
PROBAV_L2A_100M	209	0	2
PROBAV_L2A_300M	593	0	3
PROBAV_L2A_1KM	593	0	0
PROBAV_L3_S1_TOA_100M	30	120	120
PROBAV_L3_S1_TOC_100M	30	713	610
PROBAV_L3_S1_TOC_NDVI_100M	29	1	4
PROBAV_L3_S5_TOA_100M	6	0	0
PROBAV_L3_S5_TOC_100M	6	0	201
PROBAV_L3_S5_TOC_NDVI_100M	6	7	7
PROBAV_L3_S1_TOA_300M	30	180	180
PROBAV_L3_S1_TOC_300M	30	31	96
PROBAV_L3_S10_TOC_300M	3	5	5
PROBAV_L3_S10_TOC_NDVI_300M	3	0	668
PROBAV_L3_S1_TOA_1KM	30	30	31
PROBAV_L3_S1_TOC_1KM	30	31	90
PROBAV_L3_S10_TOC_1KM	3	6	155
PROBAV_L3_S10_TOC_NDVI_1KM	3	283	279

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 **1982** with **124** different nationalities representing **1437** different companies/universities.

Product type	Africa	Asia	Europe	N-America	Oceania	S-America
PROBAV_L1C	0	0.10	336.61	0	0	0
PROBAV_L2A_100M	0	0.11	0	0	0	0
PROBAV_L2A_300M	0	0.54	0.67	0	0	0
PROBAV_L2A_1KM	0	0	0	0	0	0
PROBAV_L3_S1_TOA_100M	0	361.71	1230.34	0	0	0
PROBAV_L3_S1_TOC_100M	0	0	1450.20	189.78	0	0
PROBAV_L3_S1_TOC_NDVI_100M	0	0	2.87	0	0	0
PROBAV_L3_S5_TOA_100M	0	0	0	0	0	0
PROBAV_L3_S5_TOC_100M	0	83.36	3.30	0	0	2.03
PROBAV_L3_S5_TOC_NDVI_100M	0.52	0	0.00	0	0	0
PROBAV_L3_S1_TOA_300M	0	0	89.06	0	0	1501.30
PROBAV_L3_S1_TOC_300M	0	0.00	151.36	92.98	0	0
PROBAV_L3_S10_TOC_300M	0.05	0	17.67	0	0	0
PROBAV_L3_S10_TOC_NDVI_300M	0	0	30.73	0	0	0
PROBAV_L3_S1_TOA_1KM	0	0.00	12.95	0	0	0
PROBAV_L3_S1_TOC_1KM	0	0	22.12	0.00	0	0
PROBAV_L3_S10_TOC_1KM	0.56	11.06	2.42	0	0	0
PROBAV_L3_S10_TOC_NDVI_1KM	0.01	0.10	0.30	0	0.23	0

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

Product Type	Global
L1C	336.71
PROBAV_L2A_100M	0.11
PROBAV_L2A_300M	1.21
PROBAV_L2A_1KM	0
PROBAV_L3_S1_TOA_100M	1592.06
PROBAV_L3_S1_TOC_100M	1639.99
PROBAV_L3_S1_TOC_NDVI_100M	2.87
PROBAV_L3_S5_TOA_100M	0
PROBAV_L3_S5_TOC_100M	88.69
PROBAV_L3_S5_TOC_NDVI_100M	0.52
PROBAV_L3_S1_TOA_300M	1590.35
PROBAV_L3_S1_TOC_300M	244.33
PROBAV_L3_S10_TOC_300M	17.72
PROBAV_L3_S10_TOC_NDVI_300M	30.73
PROBAV_L3_S1_TOA_1KM	12.95
PROBAV_L3_S1_TOC_1KM	22.12
PROBAV_L3_S10_TOC_1KM	14.05
PROBAV_L3_S10_TOC_NDVI_1KM	0.64

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

Company	# Downloads
JOINT RESEARCH CENTRE	668
CESBIO	485
HHU	336
USQ	242
ICMBIO	150
VITO	133
HOCHSCHULE KARLSRUHE TECHNIK UND WIRTSCHAFT	128
DESCARTES UNDERWRITING	123
UCLOUVAIN	123
TAFRESH UNI	60

Table 9: Top 10 user companies for the reporting period

Country	# Users
CHINA	213
BELGIUM	167
INDIA	98
FRANCE	92
BRAZIL	84
UNITED STATES	83
ITALY	80
NETHERLANDS	69
UNITED KINGDOM	65
GERMANY	63

Table 10: Top 10 countries with most registered users

**List of issues raised by users:**

- issue running CGLOPS BAV3 jobs on the cluster

## 4. Image Calibration services

### 4.1. Radiometric Calibration

Calibration request type	Total	Processed	Not received	Error
CLOUDS	57	30	27	0
DARK CURRENT	31	16	15	0
MOON	37	17	18	2
RAYLEIGH	71	36	35	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	17	0	17
PROBA-V_L1B_CALIBRATION	249	162	72
PROBA-V_L1B_INTERSECTION	631	365	230
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.

The orbital drift makes it difficult to interpret correctly the observed trends. Very strong seasonal variations are observed in the Libya-4 results for the RIGHT camera, while for Center camera results are stable. In the DCC results a strong decreasing trend is observed during the last year for mainly the blue strips. The foreseen updates in the calibration coefficients for Collection 2 might reduce these effects.

No bad pixel has been identified.

In total 6 lunar cycles between  $-90^\circ$  and  $90^\circ$  phase have been captured, apart from the routine moon calibration acquisitions. Constant phase angle acquisitions are very useful to characterize the temporal behaviour of a EO-sensor (i.e. PROBA-V), but they hide a large part of the applied irradiance model. PROBA-V will continue with moon calibration after the experimental phase, supporting the further development of such models (i.e. LIME). Results are currently being processed and will be presented at the next QWG meeting.

### **Radiometric ICP file**

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

The current ICP files are

- PROBAV\_ICP\_RADIOMETRIC#LEFT\_20211001\_V01
- PROBAV\_ICP\_RADIOMETRIC#CENTER\_20211001\_V01
- PROBAV\_ICP\_RADIOMETRIC#RIGHT\_20211001\_V01

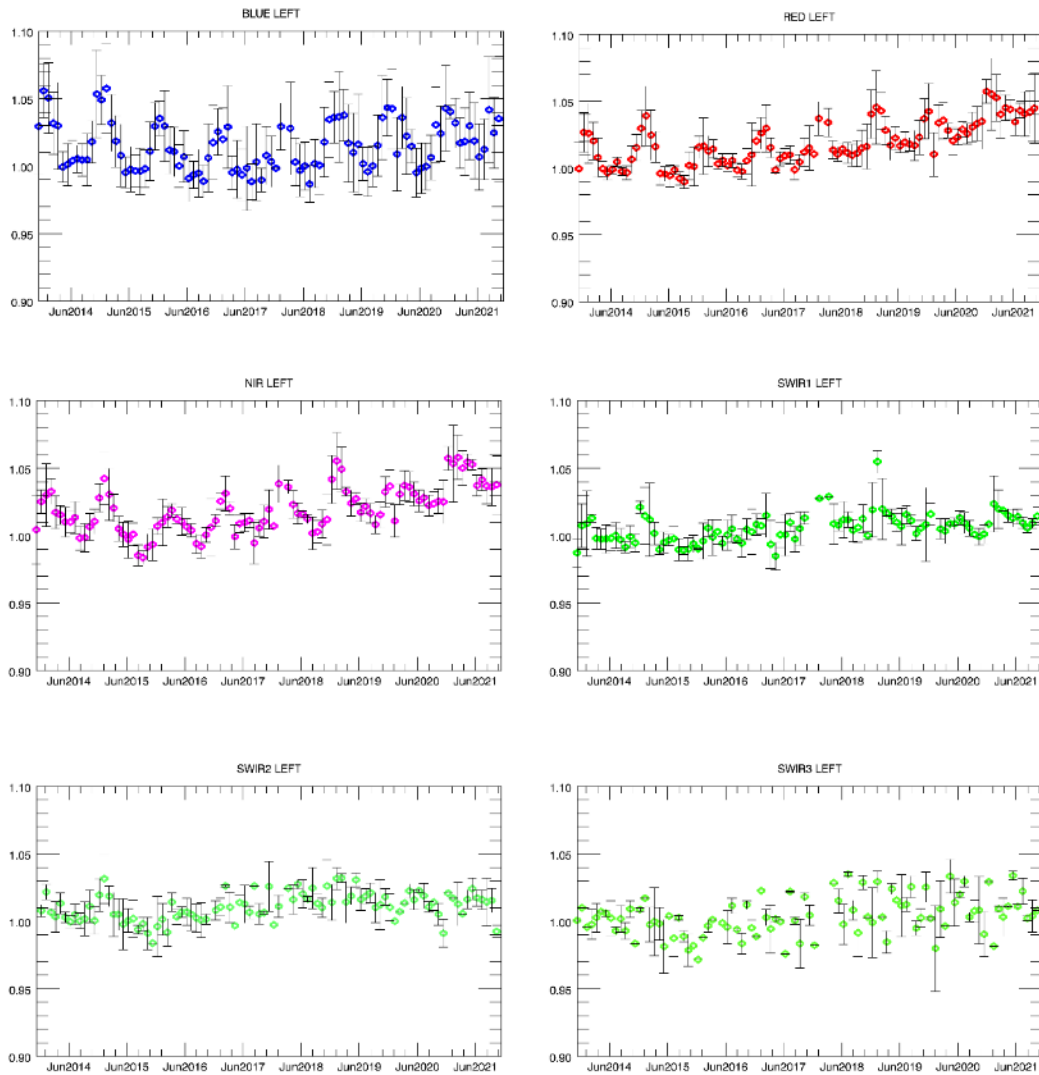


Figure 1. Libya-4 desert calibration results: LEFT monthly averaged results (collection 1)

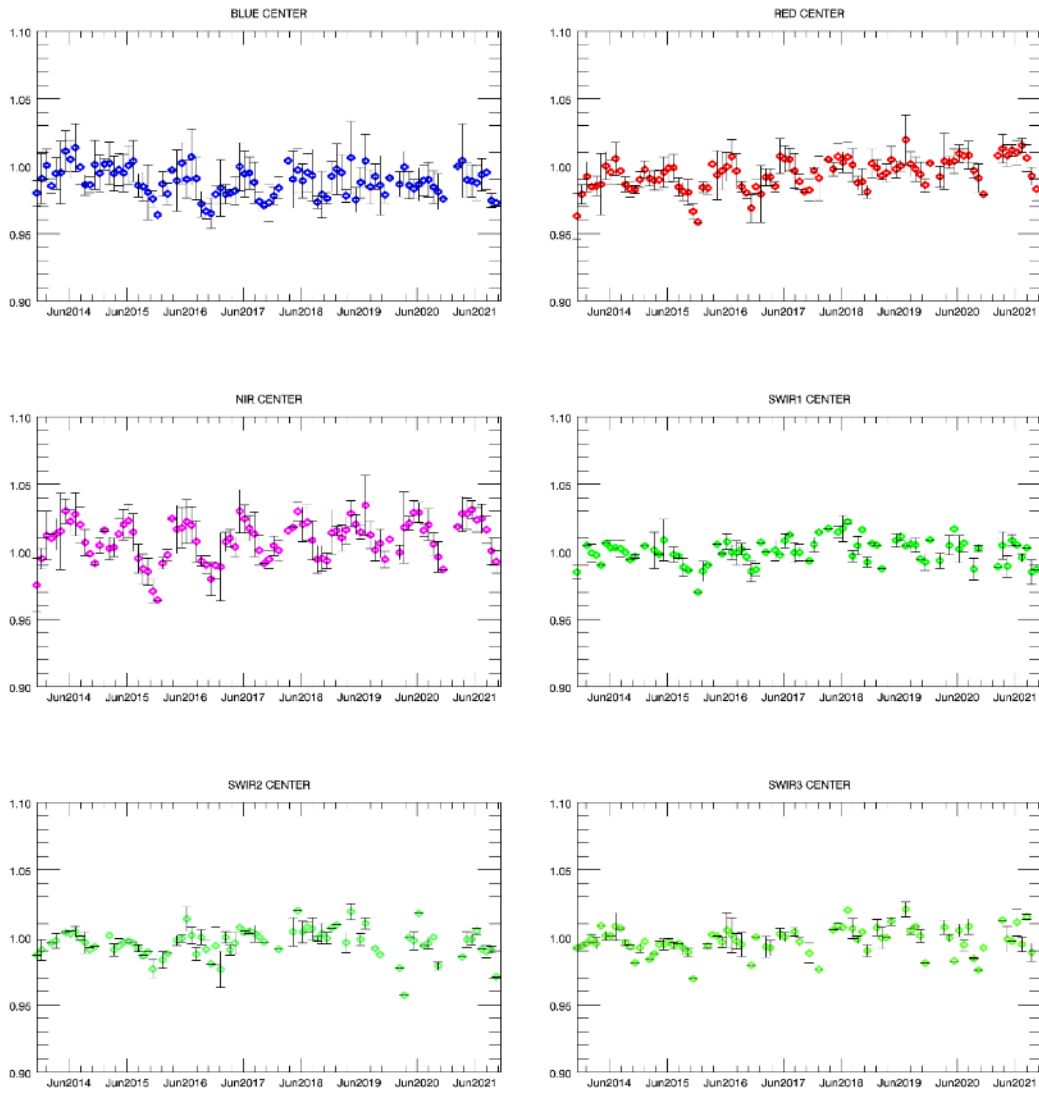


Figure 2. Libya-4 desert calibration results: CENTER monthly averaged results (collection 1)

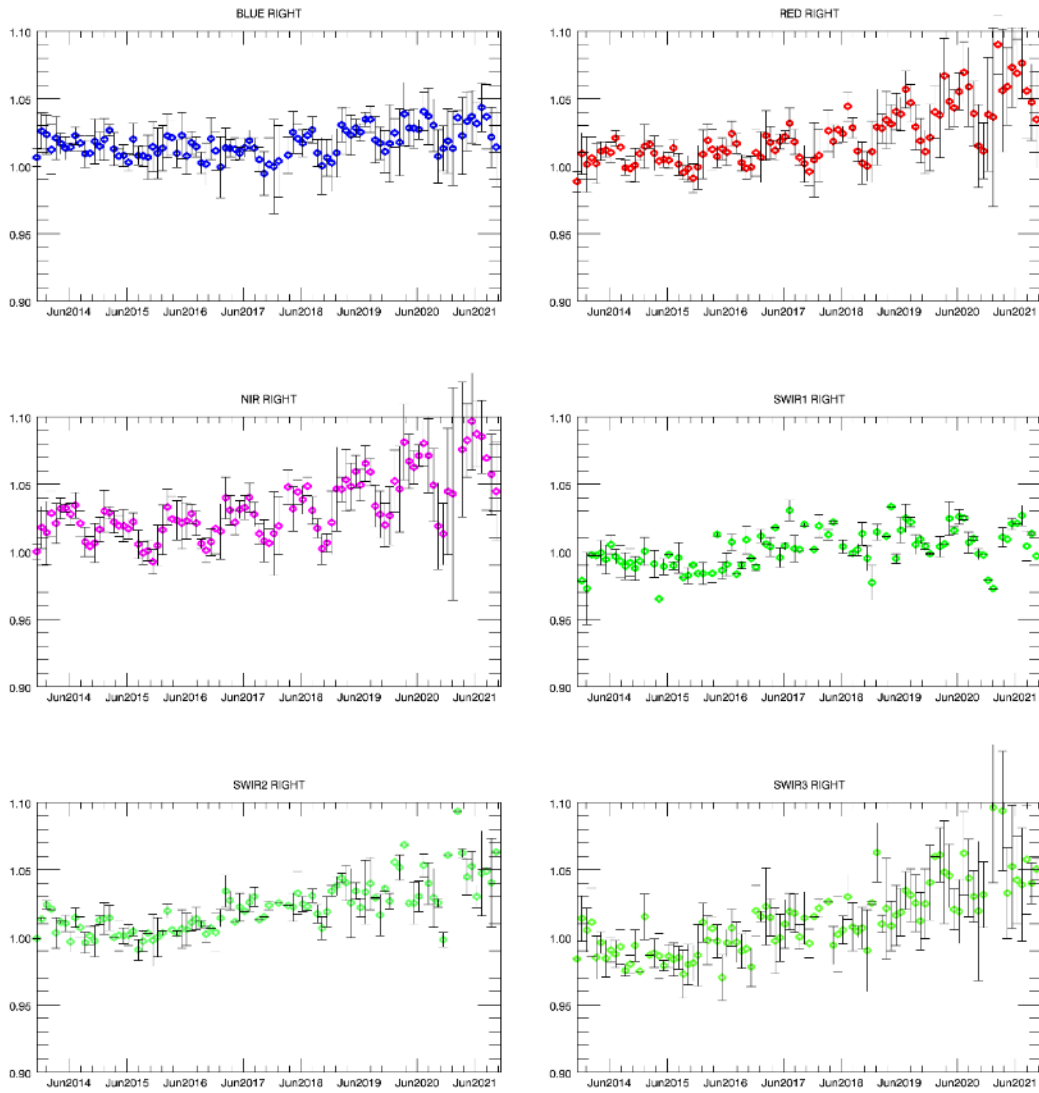


Figure 3. Libya-4 desert calibration results: RIGHT monthly averaged results (collection 1)



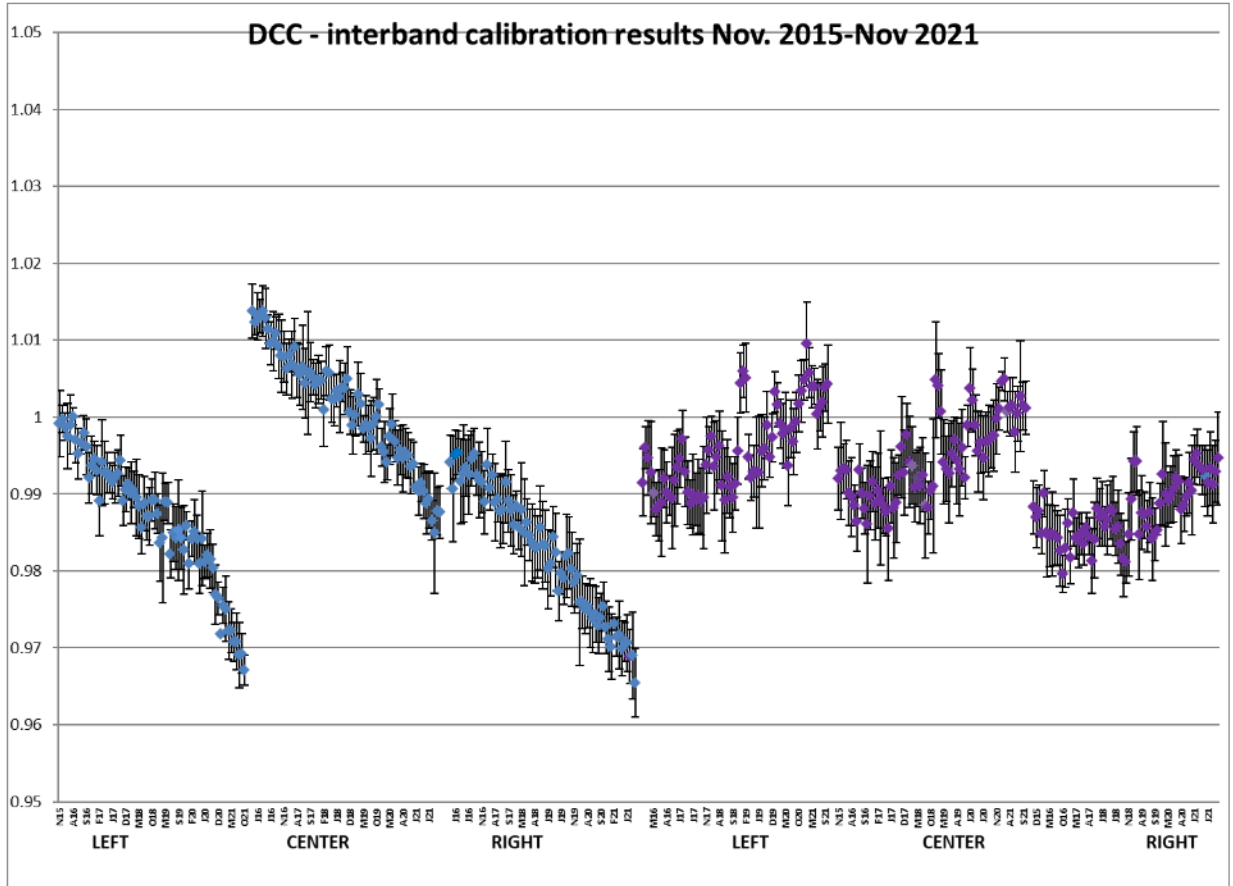


Figure 4. DCC inter-band calibration results: LEFT, CENTER and RIGHT camera (collection 1)

## 4.2. Geometric Calibration

Calibration image type	Total	Processed	Error
PROBA-V_L1C_INTERSECTION	4010	4010	0

*Table13: Processed calibration images for this reporting period*

Due to unavailability of personnel, we will update the absolute location errors in the following reporting period.

## 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 km <sup>2</sup> (missing TFF))	0	
Large Gaps (< 21600 km <sup>2</sup> )	2	02/10, 01/10
Medium Gaps (< 10000 km <sup>2</sup> )	2	16/09, 25/09
Minor Gaps (< 3600 km <sup>2</sup> )	1	30/09
Negligible Gaps (< 1000 km <sup>2</sup> )	25	11/10, 26/09, 06/10, 21/09, 24/09, 09/10, 29/09, 14/10, 04/10, 19/09, 12/10, 07/10, 22/09, 27/09, 17/09, 15/10, 10/10, 20/09, 05/10, 13/10, 08/10, 28/09, 23/09, 03/10, 18/09
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
20210916	72.47%	4	1	1				
20210917	66.21%	5	3					
20210918	65.93%	6	1					
20210919	65.10%	2	8					
20210920	66.28%	6	3					
20210921	65.99%	3	9					
20210922	66.28%	4	3					
20210923	65.45%	2	6					
20210924	65.97%	4	2					
20210925	74.58%	1		1				
20210926	66.49%	6	10					
20210927	66.03%	8	1					
20210928	64.55%	6						
20210929	66.20%	5						
20210930	67.92%	4		1				
20211001	71.12%	2						1
20211002	69.05%	6			1			
20211003	65.66%	3						
20211004	66.00%	7						
20211005	65.94%	5						
20211006	65.93%	6						
20211007	64.57%	4						
20211008	66.41%	3	3					
20211009	66.16%	7						
20211010	66.52%	4	3					
20211011	65.44%	6						
20211012	65.09%	5	1					
20211013	65.77%	4	4					
20211014	65.76%	6	3					
20211015	66.30%	9	6		1	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