



MONTHLY OPERATIONS REPORT

MOR#093

Reporting period from 16-Aug-2021 to 15-Sep-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. No missing transfer frame files were missing, and only one automatic recovery was 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.

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.

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	92	92	0	92

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	290	290	0	290
PROBAV_L1A - Nominal	652	652	0	652
PROBAV_L1C	652	652	0	652
PROBAV_L2A_100M	238	238	0	238
PROBAV_L2A_300M	652	652	0	652
PROBAV_L2A_1KM	652	652	0	652
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

3.3. Backup and archiving service

Product type	Total Files	Total File Size (GB)
TFF	89	262.52
L1A	916	468.94
Database transaction logs	384	19.08
Database incremental back-up	20	6.96
Database full back-up	6	447.66

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

Product type	Total Files	Total File Size (GB)
PROBAV_TRANSFERFRAMES	92	290.86
PROBAV_L1A	942	519.16
PROBAV_L1C	652	895.04
PROBAV_L2A_100M	476	426.05
PROBAV_L2A_300M	1304	227.35
PROBAV_L2A_1KM	1304	29.79
PROBAV_L3_S1_TOA_100M	66	486.74
PROBAV_L3_S1_TOC_100M	66	507.90
PROBAV_L3_S1_TOC_NDVI_100M	66	58.81
PROBAV_L3_S5_TOA_100M	12	344.39
PROBAV_L3_S5_TOC_100M	12	359.90
PROBAV_L3_S5_TOC_NDVI_100M	12	40.76
PROBAV_L3_S1_TOA_300M	66	230.99
PROBAV_L3_S1_TOC_300M	66	240.33
PROBAV_L3_S10_TOC_300M	6	35.98
PROBAV_L3_S10_TOC_NDVI_300M	6	3.18
PROBAV_L3_S1_TOA_1KM	66	30.79
PROBAV_L3_S1_TOC_1KM	66	31.78
PROBAV_L3_S10_TOC_1KM	6	4.80
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	244	0.30
METEO_METEOSERVICES	248	1.32
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	652	1427	1430
PROBAV_L2A_100M	238	0	0
PROBAV_L2A_300M	652	0	1
PROBAV_L2A_1KM	652	0	0
PROBAV_L3_S1_TOA_100M	33	74	97
PROBAV_L3_S1_TOC_100M	33	69	136
PROBAV_L3_S1_TOC_NDVI_100M	33	30	38
PROBAV_L3_S5_TOA_100M	6	0	2
PROBAV_L3_S5_TOC_100M	6	0	229
PROBAV_L3_S5_TOC_NDVI_100M	6	19	303
PROBAV_L3_S1_TOA_300M	37	182	184
PROBAV_L3_S1_TOC_300M	36	1559	1622
PROBAV_L3_S10_TOC_300M	3	3	6
PROBAV_L3_S10_TOC_NDVI_300M	3	0	913
PROBAV_L3_S1_TOA_1KM	36	33	35
PROBAV_L3_S1_TOC_1KM	36	33	89
PROBAV_L3_S10_TOC_1KM	3	9	9
PROBAV_L3_S10_TOC_NDVI_1KM	3	301	451

Table 6: Ordered and delivered products for this reporting period

3.5. End-user activity

10 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 **1971** with **124** different nationalities representing **1429** different companies/universities.

Product type	Africa	Asia	Europe	N-America	Oceania	S-America
PROBAV_L1C	0	0	1746.59	0	0	0
PROBAV_L2A_100M	0	0	0	0	0	0
PROBAV_L2A_300M	0	0	0.34	0	0	0
PROBAV_L2A_1KM	0	0	0	0	0	0
PROBAV_L3_S1_TOA_100M	0	83.67	1287.32	0	0	0
PROBAV_L3_S1_TOC_100M	0	0	1494.31	196.48	0	0
PROBAV_L3_S1_TOC_NDVI_100M	0	0.82	0.02	0	0.03	0
PROBAV_L3_S5_TOA_100M	0	0.12	0.56	0	0	0
PROBAV_L3_S5_TOC_100M	0	102.93	6.02	0	0.56	0
PROBAV_L3_S5_TOC_NDVI_100M	0.54	32.50	0.02	0	1.34	0
PROBAV_L3_S1_TOA_300M	0	0	99.11	0	0	1486.76
PROBAV_L3_S1_TOC_300M	0	0	261.17	95.00	0	0
PROBAV_L3_S10_TOC_300M	0	0.09	39.08	0	0	0
PROBAV_L3_S10_TOC_NDVI_300M	0	2.64	49.66	0	0	0
PROBAV_L3_S1_TOA_1KM	0	0	14.56	0	0	0
PROBAV_L3_S1_TOC_1KM	0	0	24.63	0	0	0
PROBAV_L3_S10_TOC_1KM	0.76	0	4.06	0	0	0
PROBAV_L3_S10_TOC_NDVI_1KM	0.94	0.19	0.03	0	0	0

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



Product Type	Global
L1C	1746.59
PROBAV_L2A_100M	0
PROBAV_L2A_300M	0.34
PROBAV_L2A_1KM	0
PROBAV_L3_S1_TOA_100M	1370.99
PROBAV_L3_S1_TOC_100M	1690.78
PROBAV_L3_S1_TOC_NDVI_100M	0.86
PROBAV_L3_S5_TOA_100M	0.68
PROBAV_L3_S5_TOC_100M	109.51
PROBAV_L3_S5_TOC_NDVI_100M	34.41
PROBAV_L3_S1_TOA_300M	1585.87
PROBAV_L3_S1_TOC_300M	356.16
PROBAV_L3_S10_TOC_300M	39.17
PROBAV_L3_S10_TOC_NDVI_300M	52.30
PROBAV_L3_S1_TOA_1KM	14.56
PROBAV_L3_S1_TOC_1KM	24.63
PROBAV_L3_S10_TOC_1KM	4.82
PROBAV_L3_S10_TOC_NDVI_1KM	1.16

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

Company	# Downloads
CESBIO	1520
EOSENSE	1281
JOINT RESEARCH CENTRE	873
HHU	384
UNIVERSITÉ DE DSCHANG	284
VITO	160
BEIBUWANZIYUANYOUXIANGONGSI	151
ICMBIO	149
HOCHSCHULE KARLSRUHE TECHNIK UND WIRTSCHAFT	138
UCLouvain	131

Table 9: Top 10 user companies for the reporting period

Country	# Users
CHINA	211
BELGIUM	167
INDIA	98
FRANCE	92
BRAZIL	84
UNITED STATES	82
ITALY	80
NETHERLANDS	68
UNITED KINGDOM	64
GERMANY	62

Table 10: Top 10 countries with most registered users

List of issues raised by users:

No issues reported

4. Image Calibration services

4.1. Radiometric Calibration

Calibration request type	Total	Processed	Not received	Error
CLOUDS	40	26	14	0
DARK CURRENT	27	17	10	0
MOON	23	18	5	0
RAYLEIGH	61	36	25	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	20	13	7
PROBA-V_L1B_CALIBRATION	270	200	61
PROBA-V_L1B_INTERSECTION	638	427	211
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 is strongly impacting the calibration results for mainly the RIGHT camera : very strong seasonal variations in the Libya-4 results are observed. For the LEFT camera a slight increasing trend is observed. The Center camera results are stable.

One bad pixel has been identified: CENTER SWIR2 pixel ID 196

A new series of lunar acquisitions has been scheduled covering the full lunar phase to support the LIME lunar calibration model development. It is intended to perform moon calibration activities on a routine basis after the end of the experimental phase

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. Furthermore one bad pixel will be added (i.e. CENTER SWIR2 pixel ID 196)

The current ICP files are

- PROBAV_ICP_RADIOMETRIC#LEFT_20210901_V01
- PROBAV_ICP_RADIOMETRIC#CENTER_20210901_V01
- PROBAV_ICP_RADIOMETRIC#RIGHT_20210901V01

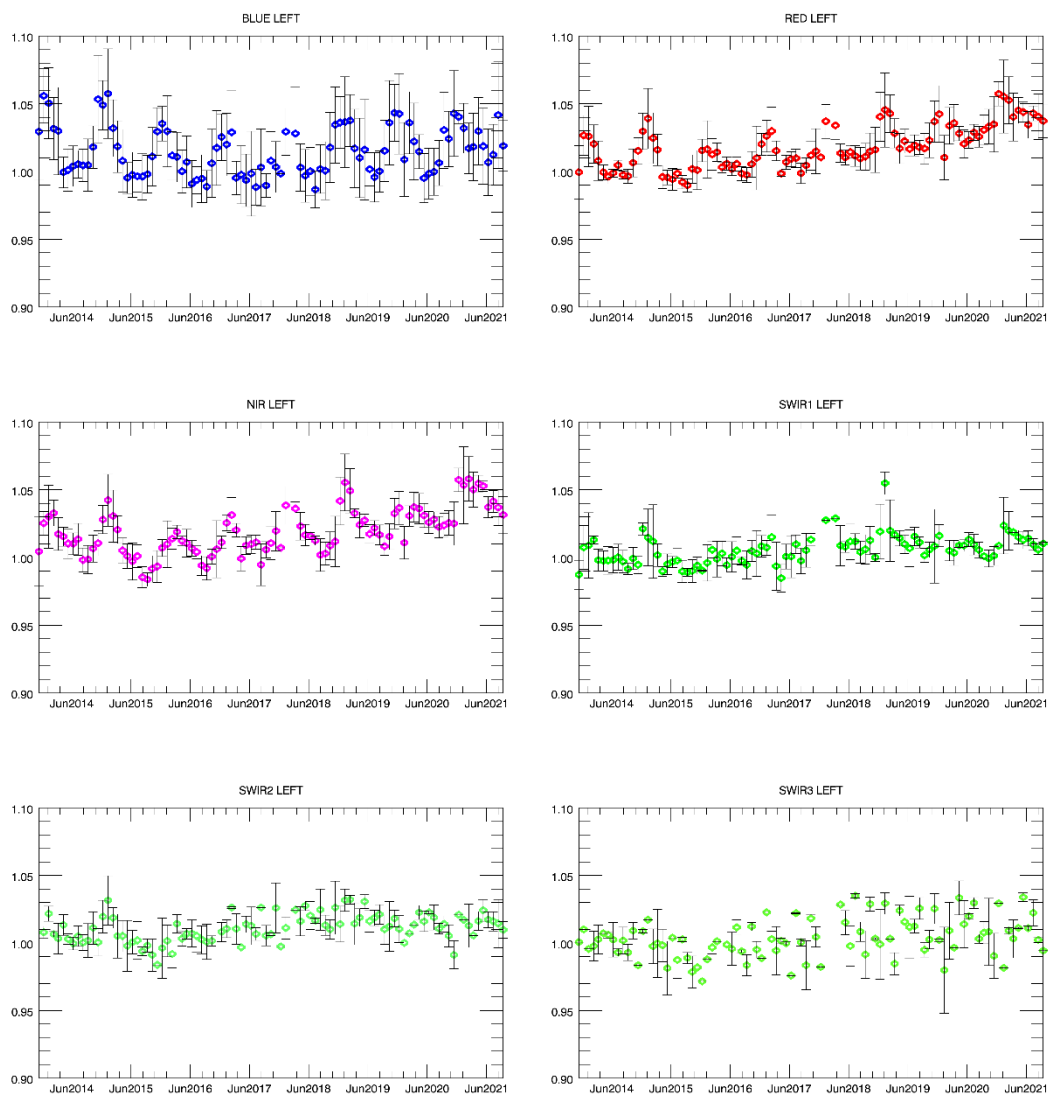


Figure 1. Libya-4 desert calibration results: LEFT monthly averaged results (collection 1)

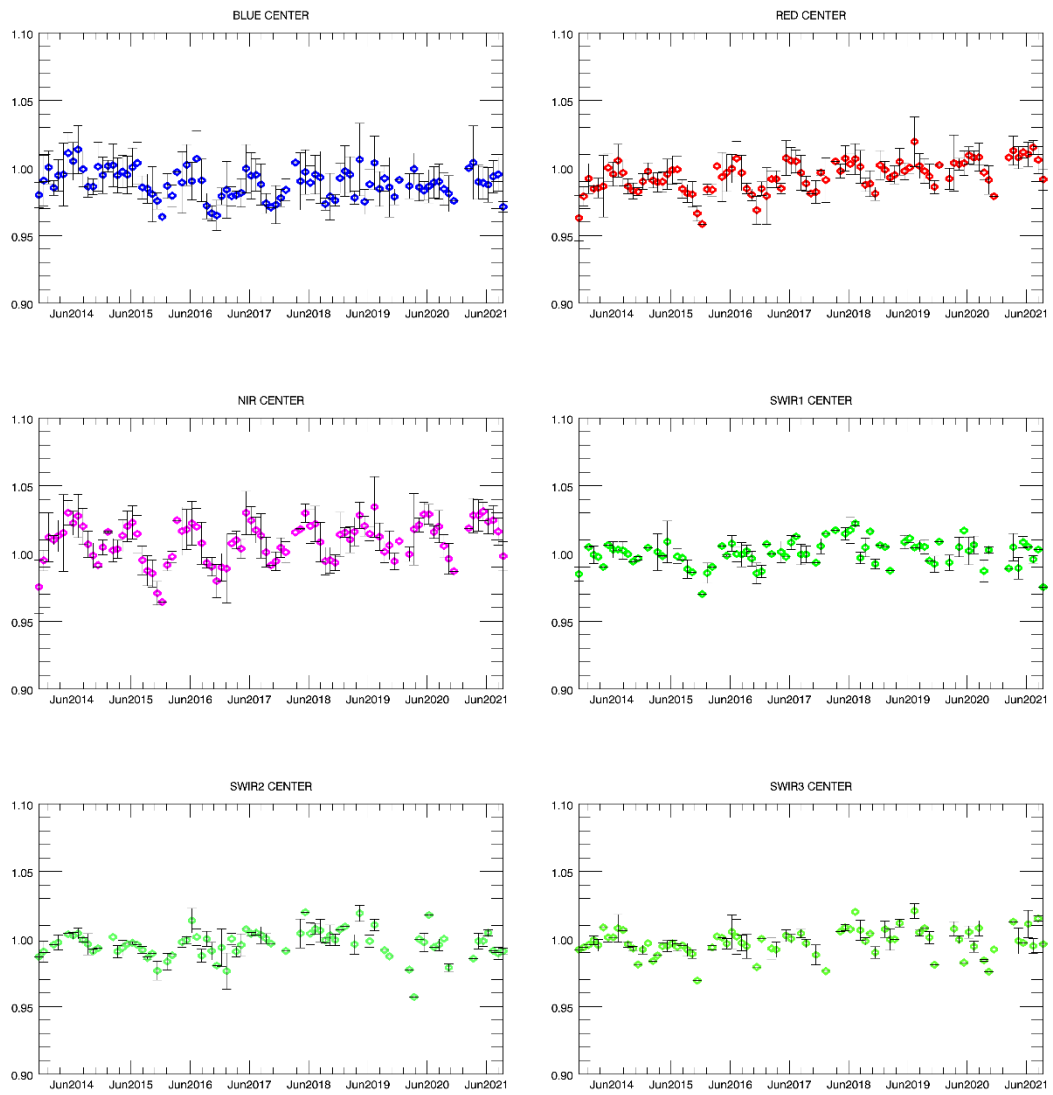


Figure 2. Libya-4 desert calibration results: CENTER monthly averaged results (collection 1)

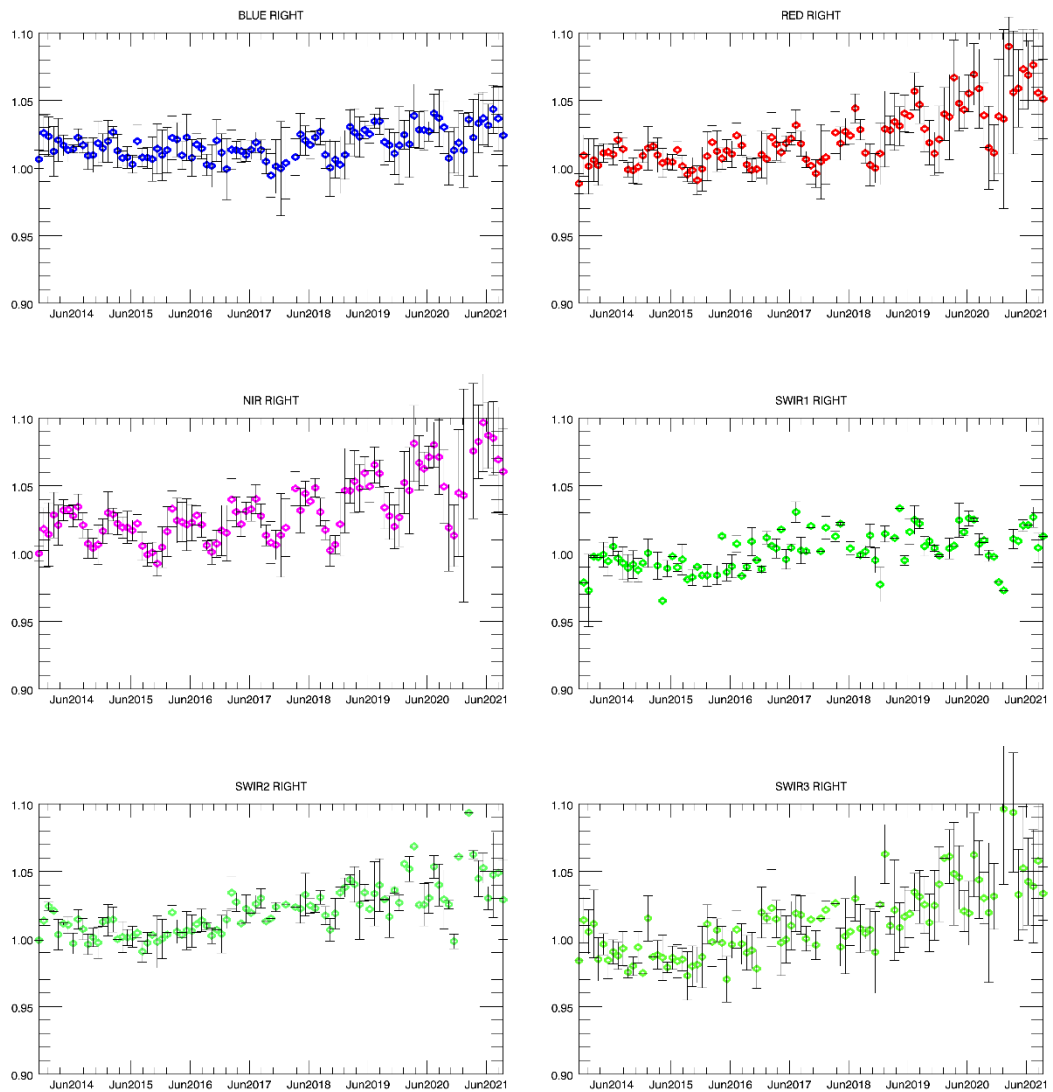


Figure 3. Libya-4 desert calibration results: RIGHT monthly averaged results (collection 1)

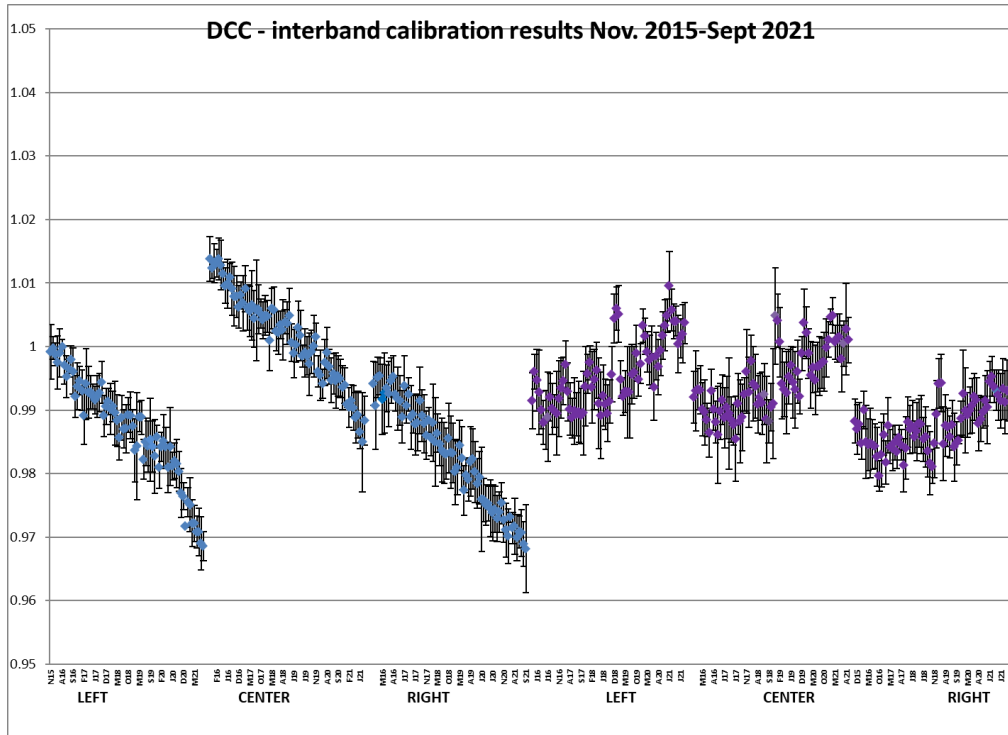


Figure 4. DCC inter-band calibration results: LEFT, CENTER and RIGHT camera (collection 1)

4.2. Geometric Calibration

Calibration image type	Total	Processed	Error
PROBA-V_L1C_INTERSECTION	4185	4185	0

Table13: Processed calibration images for this reporting period

During the reporting period, the average ALE was < 69 m ($s < 96$ m).

Figure X shows that the daily ALE evolution was mostly within 55 - 75 m, except for 7/9, when values peaked to 73 - 81 m.

The average compliance was 99.19 (98.69 - 99.64% for BLUE - SWIR), with minimum values 97.82% - 99.46% (BLUE - SWIR).

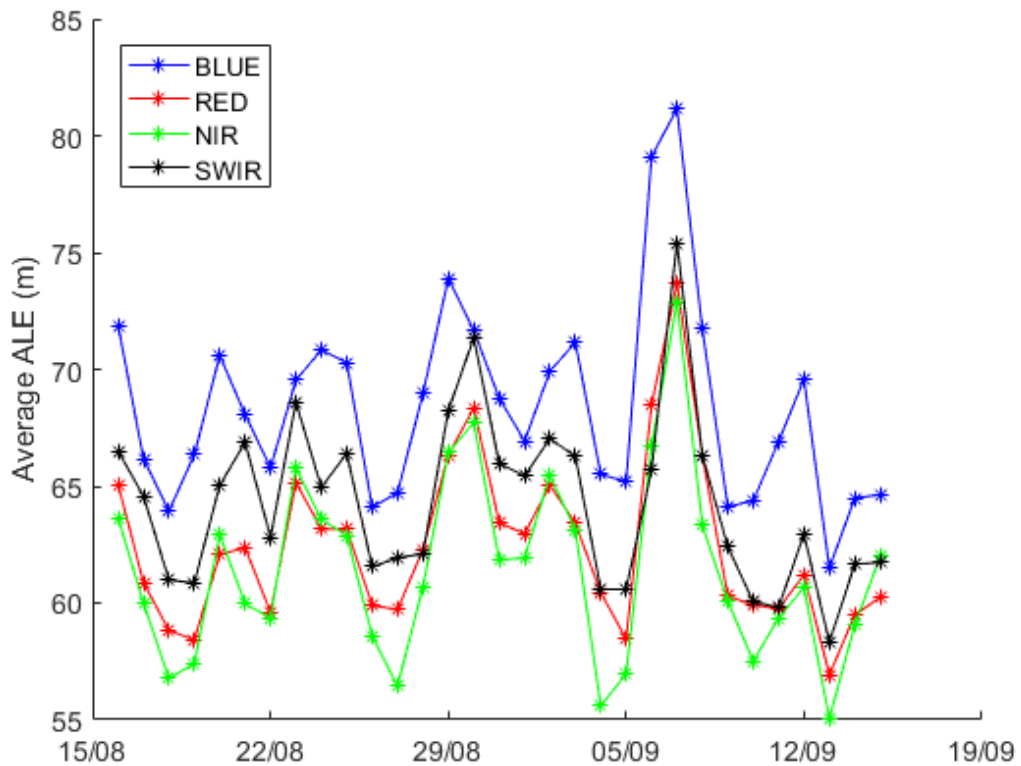


Figure 5: Daily ALE evolution for 16/8 – 15/9/2021.

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 ² (missing TFF))	0	
Large Gaps (< 21600 km ²)	1	09/09
Medium Gaps (< 10000 km ²)	0	
Minor Gaps (< 3600 km ²)	1	06/09
Negligible Gaps (< 1000 km ²)	29	27/08, 22/08, 17/08, 01/09, 11/09, 20/08, 30/08, 25/08, 04/09, 14/09, 02/09, 28/08, 07/09, 23/08, 18/08, 12/09, 21/08, 05/09, 26/08, 31/08, 10/09, 15/09, 16/08, 19/08, 24/08, 13/09, 08/09, 03/09, 29/08
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
20210816	65.97%	7	6					
20210817	66.09%	8	5					
20210818	64.90%	7						
20210819	66.27%	1	4					
20210820	66.37%	5	4					
20210821	66.43%	5	6					
20210822	65.84%	5	6					
20210823	65.86%	2	5					
20210824	66.17%	5	5					
20210825	65.96%	8	6					
20210826	66.12%	9	3					
20210827	65.12%	7	6					
20210828	66.73%	4	4			1		
20210829	66.36%	7	6					
20210830	66.16%	1						
20210831	65.86%	1	5					
20210901	65.76%		6					
20210902	66.10%	3	4					
20210903	65.93%	3	1					
20210904	66.17%	7	4					
20210905	65.20%	5	2					
20210906	69.12%	3	4		1			
20210907	66.33%		4					
20210908	66.69%	5	7					
20210909	74.26%	1						1
20210910	65.76%	7						
20210911	66.22%	3	4					
20210912	65.95%	7	3					
20210913	66.20%	6	3					
20210914	65.37%	2	5					
20210915	66.12%	2						

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
- Optimization on the processing speed of th reprocessing activities is ongoing.

7. Operational remarks

No operational remarks