



MONTHLY OPERATIONS REPORT

MOR#089

Reporting period from 16-Apr-2021 to 15-May-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 transferframe 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.

End-to-end testing and processing was performed in the last month for 5 selected dates and 10-daily composites to verify collection 2 processing workflows before the complete archive is 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	239	239	0	239
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	299	299	0	299
PROBAV_L1A - Nominal	633	633	0	633
PROBAV_L1C	633	633	0	633
PROBAV_L2A_100M	228	228	0	228
PROBAV_L2A_300M	633	633	0	633
PROBAV_L2A_1KM	633	633	0	633
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	257.49
L1A	906	457.09
Database transaction logs	384	20.43
Database incremental back-up	26	5.52
Database full back-up	5	309.73

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

Product type	Total Files	Total File Size (GB)
PROBAV_TRANSFERFRAMES	82	259.58
PROBAV_L1A	835	453.36
PROBAV_L1C	573	776.16
PROBAV_L2A_100M	408	362.82
PROBAV_L2A_300M	1160	198.76
PROBAV_L2A_1KM	1153	26.36
PROBAV_L3_S1_TOA_100M	54	393.58
PROBAV_L3_S1_TOC_100M	54	409.37
PROBAV_L3_S1_TOC_NDVI_100M	54	47.51
PROBAV_L3_S5_TOA_100M	12	339.00
PROBAV_L3_S5_TOC_100M	12	353.40
PROBAV_L3_S5_TOC_NDVI_100M	12	40.34
PROBAV_L3_S1_TOA_300M	55	191.94
PROBAV_L3_S1_TOC_300M	55	199.53
PROBAV_L3_S10_TOC_300M	6	35.98
PROBAV_L3_S10_TOC_NDVI_300M	6	3.21
PROBAV_L3_S1_TOA_1KM	55	25.87
PROBAV_L3_S1_TOC_1KM	55	26.69
PROBAV_L3_S10_TOC_1KM	6	4.88
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	214	0.26
METEO_METEOSERVICES	222	1.19
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	634	1338	1339
PROBAV_L2A_100M	297	0	4
PROBAV_L2A_300M	649	0	37
PROBAV_L2A_1KM	641	0	2
PROBAV_L3_S1_TOA_100M	29	60	68
PROBAV_L3_S1_TOC_100M	29	64	137
PROBAV_L3_S1_TOC_NDVI_100M	29	8	9
PROBAV_L3_S5_TOA_100M	7	0	4
PROBAV_L3_S5_TOC_100M	6	9	9
PROBAV_L3_S5_TOC_NDVI_100M	6	287	423
PROBAV_L3_S1_TOA_300M	30	186	194
PROBAV_L3_S1_TOC_300M	30	452	523
PROBAV_L3_S10_TOC_300M	3	60	60
PROBAV_L3_S10_TOC_NDVI_300M	3	0	206
PROBAV_L3_S1_TOA_1KM	30	35	35
PROBAV_L3_S1_TOC_1KM	30	30	71
PROBAV_L3_S10_TOC_1KM	3	9	11
PROBAV_L3_S10_TOC_NDVI_1KM	3	323	349

Table 6: Ordered and delivered products for this reporting period

3.5. End-user activity

6 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 **1939** with **122** different nationalities representing **1403** different companies/universities.

Product type	Africa	Asia	Europe	N-America	Oceania	S-America
PROBAV_L1C	0	0	1568.44	0	0	0
PROBAV_L2A_100M	0.00	0.42	4.51	0	0	0
PROBAV_L2A_300M	0.13	0	9.69	0	0	0
PROBAV_L2A_1KM	0	0	0.06	0	0	0
PROBAV_L3_S1_TOA_100M	0	0	1386.38	0	0	0
PROBAV_L3_S1_TOC_100M	0	0	1661.22	186.50	0	0
PROBAV_L3_S1_TOC_NDVI_100M	0	0	0.79	0	0	0
PROBAV_L3_S5_TOA_100M	0.05	0	1.19	0	0	0
PROBAV_L3_S5_TOC_100M	19.13	0.21	0	0	0	0
PROBAV_L3_S5_TOC_NDVI_100M	6.86	6.40	2402.97	0	0	0
PROBAV_L3_S1_TOA_300M	0	0	89.67	0	0	1453.04
PROBAV_L3_S1_TOC_300M	0	0	170.66	91.05	0	0
PROBAV_L3_S10_TOC_300M	2.31	0	18.04	0	0	0
PROBAV_L3_S10_TOC_NDVI_300M	0	0	24.56	0	0	0
PROBAV_L3_S1_TOA_1KM	0	0	18.40	0	0	0
PROBAV_L3_S1_TOC_1KM	0	0	22.11	0	0	0
PROBAV_L3_S10_TOC_1KM	0.56	0	3.32	0	0	0
PROBAV_L3_S10_TOC_NDVI_1KM	0.05	6.99	0.25	0	0	0

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



Product Type	Global
L1C	1568.44
PROBAV_L2A_100M	4.93
PROBAV_L2A_300M	9.82
PROBAV_L2A_1KM	0.06
PROBAV_L3_S1_TOA_100M	1386.38
PROBAV_L3_S1_TOC_100M	1847.72
PROBAV_L3_S1_TOC_NDVI_100M	0.79
PROBAV_L3_S5_TOA_100M	1.24
PROBAV_L3_S5_TOC_100M	19.34
PROBAV_L3_S5_TOC_NDVI_100M	2416.22
PROBAV_L3_S1_TOA_300M	1542.71
PROBAV_L3_S1_TOC_300M	261.71
PROBAV_L3_S10_TOC_300M	20.35
PROBAV_L3_S10_TOC_NDVI_300M	24.56
PROBAV_L3_S1_TOA_1KM	18.40
PROBAV_L3_S1_TOC_1KM	22.11
PROBAV_L3_S10_TOC_1KM	3.88
PROBAV_L3_S10_TOC_NDVI_1KM	7.29

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



Company	# Downloads
EOSENSE	1274
UPMC	459
UNIVERSITY OF TRIER	272
OPENGEOHUB FOUNDATION	211
ICMBIO	156
VITO	152
FST	134
JOINT RESEARCH CENTRE	132
UCLouvain	126
DESCARTES UNDERWRITING	123

Table 9: Top 10 user companies for the reporting period

Country	# Users
CHINA	204
BELGIUM	166
INDIA	96
FRANCE	91
BRAZIL	84
UNITED STATES	82
ITALY	80
NETHERLANDS	66
UNITED KINGDOM	64
GERMANY	60

Table 10: Top 10 countries with most registered users

List of issues raised by users:

- Decoding of PROBAV signal

4. Image Calibration services

4.1. Radiometric Calibration

Calibration request type	Total	Processed	Not received	Error
CLOUDS	33	32	1	0
DARK CURRENT	21	21	0	0
MOON	2	2	0	0
RAYLEIGH	45	44	1	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	297	252	45
PROBA-V_L1B_INTERSECTION	635	402	233
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.

Similarly as in previous months we observe very strong seasonal variations in the Libya-4 results for mainly the RIGHT camera. We assume that this might be due to uncertainties in the OSCAR desert model combined with the orbital drift of PROBA-V. This is not observed for the CENTER camera, while the LEFT camera a slight increasing trend is observed.

No bad pixels were identified.

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_20210501_V01
- PROBAV_ICP_RADIOMETRIC#CENTER_20210501_V01
- PROBAV_ICP_RADIOMETRIC#RIGHT_20210501V01

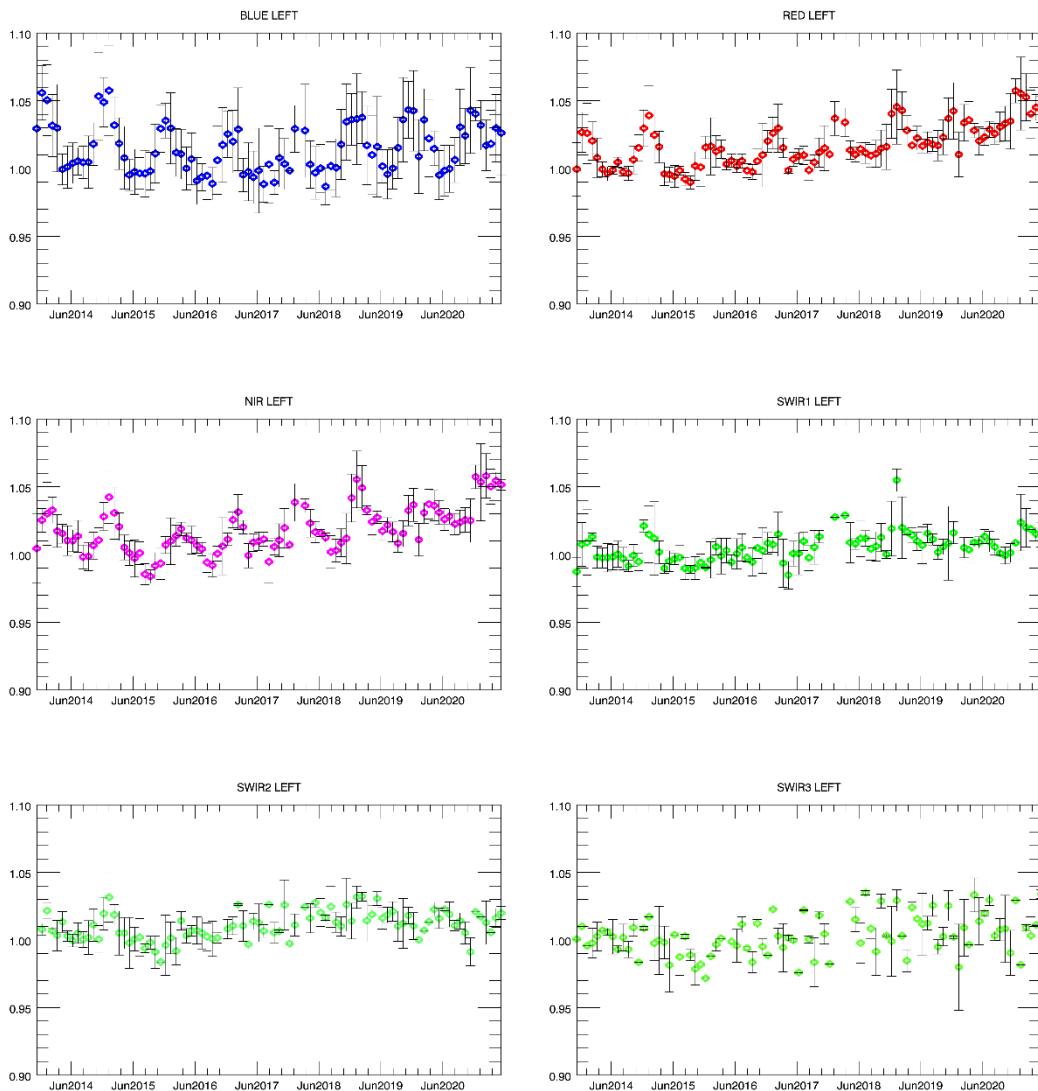


Figure 1. Libya-4 desert calibration results: LEFT monthly averaged results (collection 1)

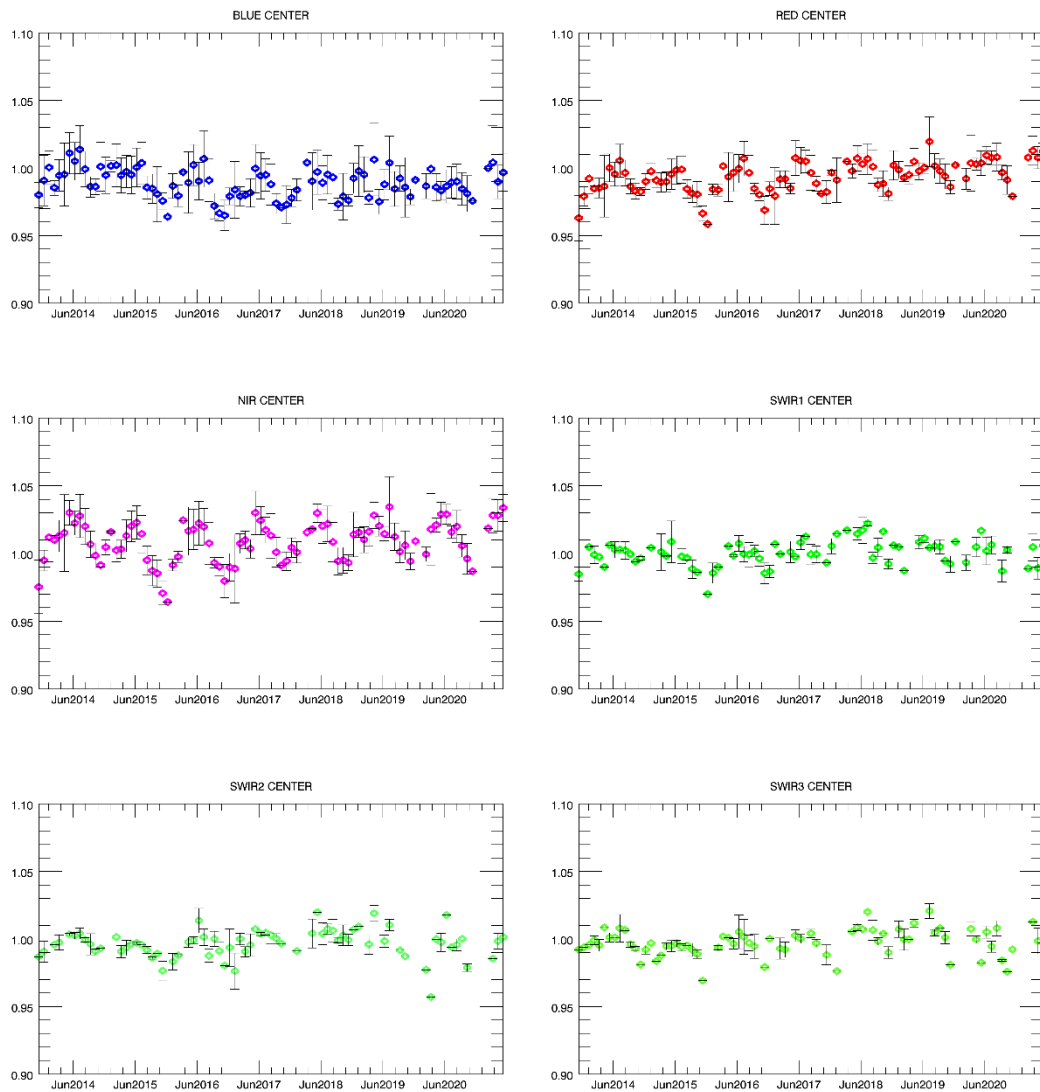


Figure 2. Libya-4 desert calibration results: CENTER monthly averaged results (collection 1)

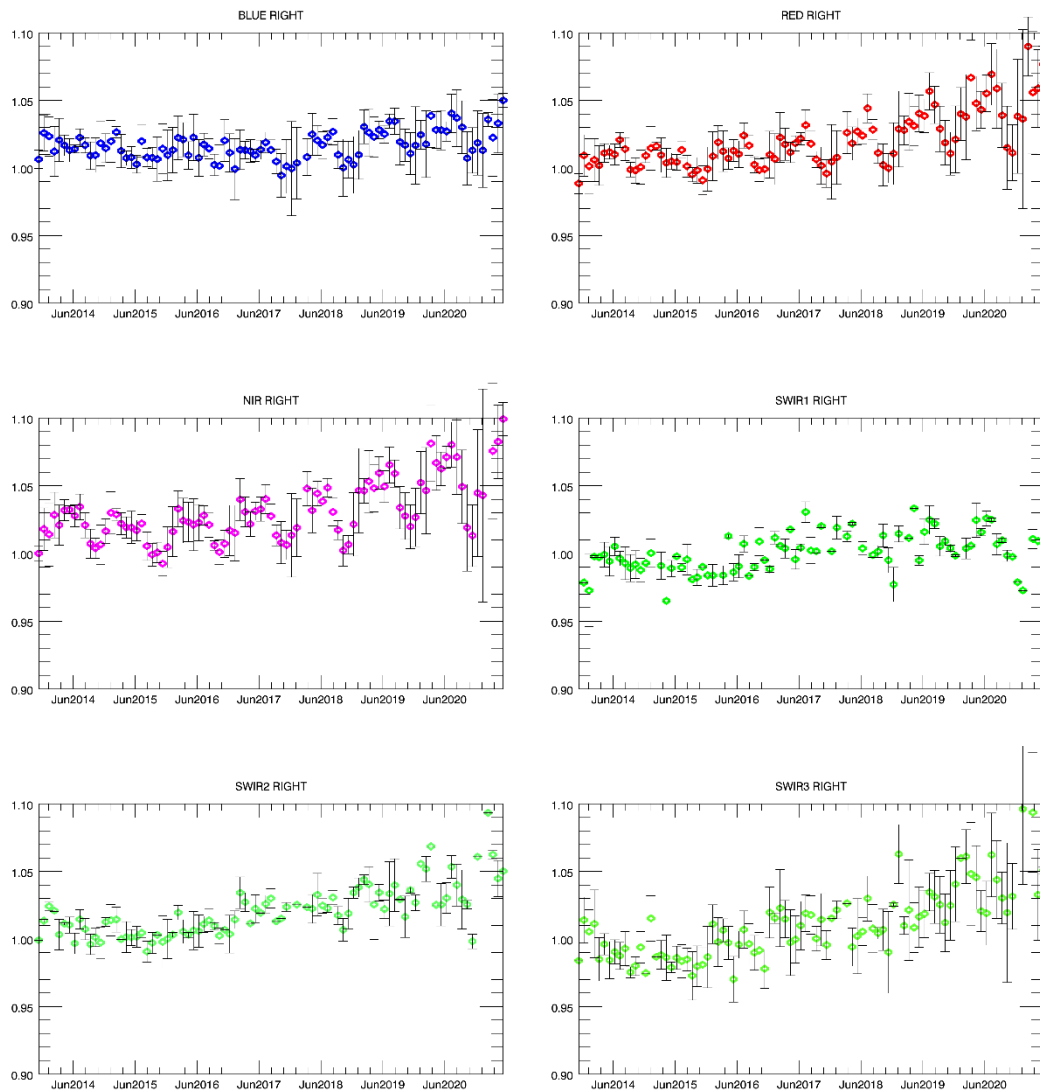


Figure 3. Libya-4 desert calibration results: RIGHT monthly averaged results (collection 1)

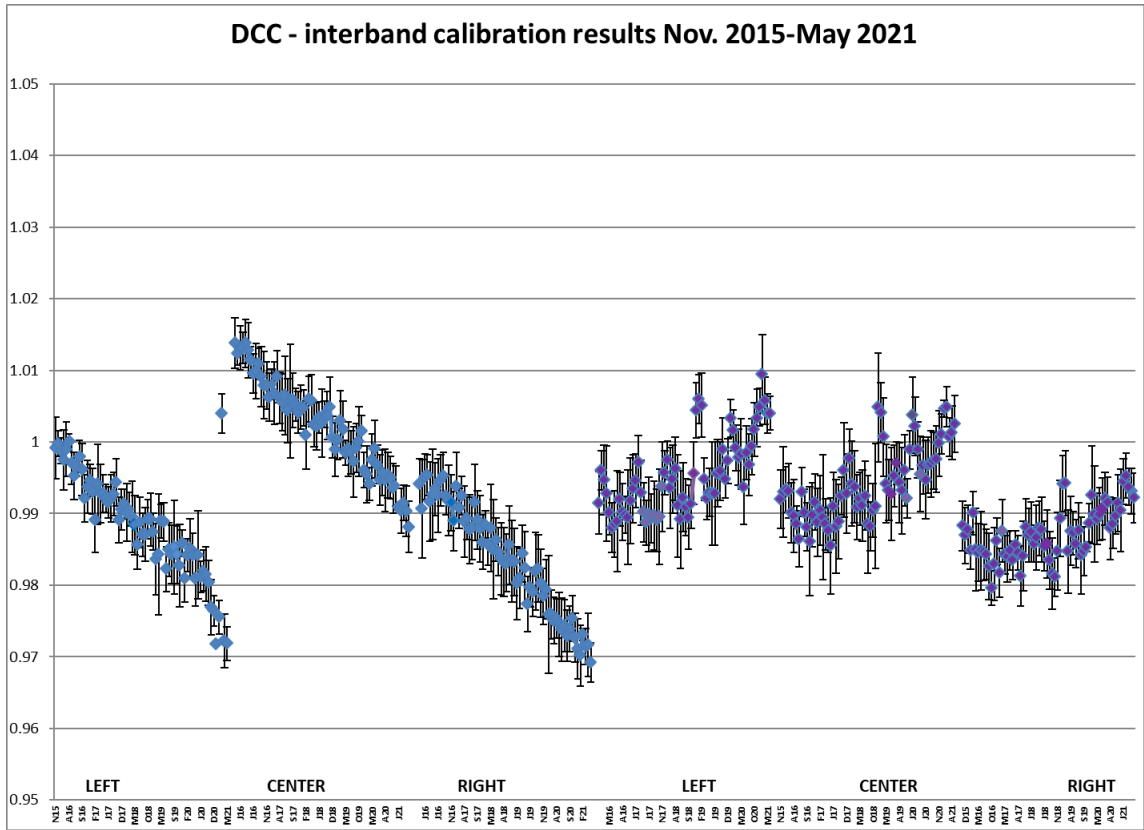


Figure 4. DCC inter-band calibration results: LEFT, CENTER and RIGHT camera (collection 1)

4.2. Geometric Calibration

Calibration image type	Total	Processed	Error
PROBA-V_L1C_INTERSECTION	4136	4136	0

Table13: Processed calibration images for this reporting period

During the reporting period 16/4 – 15/5, the average ALE was < 65 m (sigma < 90 m). The daily ALE evolution (Figure 5) shows a 5 – 6 day oscillation, with peaks for BLUE at 68 – 72 m. The average compliance was 99.24% (98.77% – 99.67% for BLUE – SWIR).

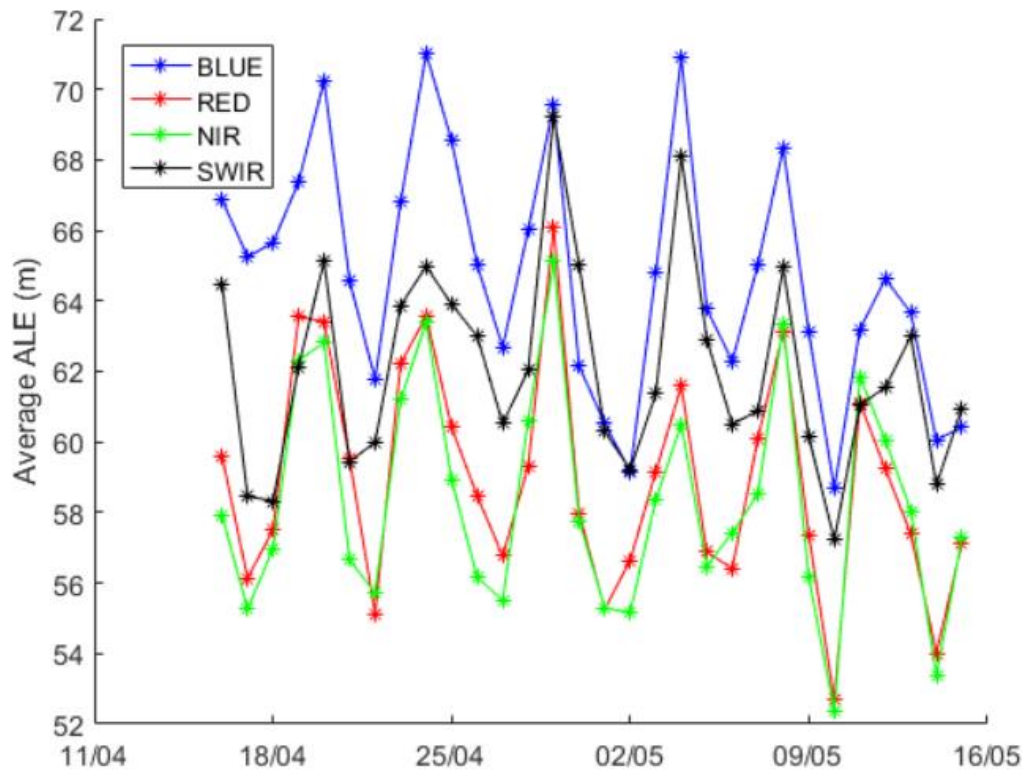


Figure 5: Daily ALE evolution for 16/4 – 15/5/2021.

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 km² (missing TFF))	0	
Large Gaps (< 21600 km²)	0	
Medium Gaps (< 10000 km²)	0	
Minor Gaps (< 3600 km²)	0	
Negligible Gaps (< 1000 km²)	30	24/04, 19/04, 04/05, 09/05, 14/05, 29/04, 12/05, 07/05, 22/04, 17/04, 27/04, 02/05, 05/05, 30/04, 25/04, 10/05, 15/05, 20/04, 23/04, 08/05, 28/04, 03/05, 18/04, 13/05, 01/05, 26/04, 11/05, 06/05, 16/04, 21/04
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
20210416	66.17%	11	4					
20210417	65.79%	4						
20210418	65.55%	7	1					
20210419	66.10%	6						
20210420	65.86%	12	1					
20210421	66.13%	6						
20210422	65.27%	6						
20210423	66.06%	7	1					
20210424	66.26%	10	4					
20210425	66.14%	13						
20210426	65.87%	10						
20210427	64.42%	10	1					
20210428	66.23%	10	3					
20210429	65.95%	12	2					
20210430	66.43%	9	8					
20210501	65.45%	5	1					
20210502	66.05%	4	3					
20210503	66.13%	10	3					
20210504	66.08%	10						
20210505	65.95%	4						
20210506	64.55%	9	1					
20210507	66.21%	9	2					
20210508	65.97%	9						
20210509	66.30%	12						
20210510	65.67%	10	5					
20210511	65.85%	7	3					
20210512	66.08%	7						
20210513	66.07%	10						
20210514	66.01%	9						
20210515	64.68%	5						

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:
End-to-end processing of three 10-daily composites for the new C2 reprocessing chain is ongoing. Positive validation of these dates will trigger the start of the new collection reprocessing.
- No other activities scheduled.

7. Operational remarks

No operational remarks