MONTHLY OPERATIONS REPORT

MOR#091

Reporting period from 16-Jun-2021 to 15-Jul-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 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 in 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 kicked off in the last month 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	240	240	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	212	212	0	212
PROBAV_L1A - Nominal	640	640	0	640
PROBAV_L1C	640	640	0	640
PROBAV_L2A_100M	231	231	0	231
PROBAV_L2A_300M	640	640	0	640
PROBAV_L2A_1KM	640	640	0	640
PROBAV_L3_S1_TOA_100M	30	29	0	29
PROBAV_L3_S1_TOC_100M	30	29	0	29
PROBAV_L3_S1_TOC_NDVI_100M	30	29	0	29
PROBAV_L3_S5_TOA_100M	6	5	0	5
PROBAV_L3_S5_TOC_100M	6	5	0	5
PROBAV_L3_S5_TOC_NDVI_100M	6	5	0	5
PROBAV_L3_S1_TOA_300M	30	29	0	29
PROBAV_L3_S1_TOC_300M	30	29	0	29
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	29	0	29
PROBAV_L3_S1_TOC_1KM	30	29	0	29
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	245.79
L1A	820	432.34
Database transaction logs	384	20.33
Database incremental back-up	26	10.23
Database full back-up	2	140.2

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

Product type	Total Files	Total File Size (GB)
PROBAV_TRANSFERFRAMES	87	263.92
PROBAV_L1A	820	464.22
PROBAV_L1C	620	827.38
PROBAV_L2A_100M	449	390.71
PROBAV_L2A_300M	1235	206.83
PROBAV_L2A_1KM	1235	27.35
PROBAV_L3_S1_TOA_100M	58	419.57
PROBAV_L3_S1_TOC_100M	58	437.08
PROBAV_L3_S1_TOC_NDVI_100M	58	52.66
PROBAV_L3_S5_TOA_100M	12	334.05
PROBAV_L3_S5_TOC_100M	12	348.27
PROBAV_L3_S5_TOC_NDVI_100M	12	40.83
PROBAV_L3_S1_TOA_300M	58	198.96
PROBAV_L3_S1_TOC_300M	58	204.85
PROBAV_L3_S10_TOC_300M	6	35.21
PROBAV_L3_S10_TOC_NDVI_300M	6	3.13
PROBAV_L3_S1_TOA_1KM	58	26.77
PROBAV_L3_S1_TOC_1KM	58	27.39
PROBAV_L3_S10_TOC_1KM	6	4.70
PROBAV_L3_S10_TOC_NDVI_1KM	6	0.39
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	228	0.28
METEO_METEOSERVICES	232	1.24
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	643	816	816
PROBAV_L2A_100M	230	1	5
PROBAV_L2A_300M	638	0	3
PROBAV_L2A_1KM	638	0	0
PROBAV_L3_S1_TOA_100M	30	60	61
PROBAV_L3_S1_TOC_100M	30	64	125
PROBAV_L3_S1_TOC_NDVI_100M	30	0	1
PROBAV_L3_S5_TOA_100M	6	12	18
PROBAV_L3_S5_TOC_100M	6	12	164
PROBAV_L3_S5_TOC_NDVI_100M	6	80	85
PROBAV_L3_S1_TOA_300M	30	175	175
PROBAV_L3_S1_TOC_300M	30	30	94
PROBAV_L3_S10_TOC_300M	3	7	8
PROBAV_L3_S10_TOC_NDVI_300M	3	72	297
PROBAV_L3_S1_TOA_1KM	30	39	40
PROBAV_L3_S1_TOC_1KM	30	30	81
PROBAV_L3_S10_TOC_1KM	3	6	6
PROBAV_L3_S10_TOC_NDVI_1KM	3	49	56

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 **1958** with **123** different nationalities representing **1419** different companies/universities.

Product type	Africa	Asia	Europe	N-America	Oceania	S-America
PROBAV_L1C	0	0	1086.23	0	0	0
PROBAV_L2A_100M	0	0	7.29	0	0	0
PROBAV_L2A_300M	0	0	1.01	0	0	0
PROBAV_L2A_1KM	0	0	0	0	0	0
PROBAV_L3_S1_TOA_100M	0	0	1315.35	0	0	0
PROBAV_L3_S1_TOC_100M	0	0.23	1548.76	185.44	0	0
PROBAV_L3_S1_TOC_NDVI_100M	0	0	0.02	0	0	0
PROBAV_L3_S5_TOA_100M	0	2.00	2.44	0	0	0
PROBAV_L3_S5_TOC_100M	22.49	3.31	53.39	0	0	0

PROBAV_L3_S5_TOC_NDVI_100M	0.59	13.90	0.19	0	0	0
PROBAV_L3_S1_TOA_300M	0	0	88.28	0	0	1436.78
PROBAV_L3_S1_TOC_300M	0	0	149.55	89.43	0	0
PROBAV_L3_S10_TOC_300M	2.54	0	17.64	0	0	0
PROBAV_L3_S10_TOC_NDVI_300M	0	0.33	31.79	0	0	0
PROBAV_L3_S1_TOA_1KM	0	0	13.23	0.01	0	0
PROBAV_L3_S1_TOC_1KM	0	0	22.01	0	0	0
PROBAV_L3_S10_TOC_1KM	0.55	0	2.43	0	0	0
PROBAV_L3_S10_TOC_NDVI_1KM	0.00	1.75	0.01	0	0	0

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

Product Type	Global
L1C	1086.23
PROBAV_L2A_100M	7.29
PROBAV_L2A_300M	1.01
PROBAV_L2A_1KM	0
PROBAV_L3_S1_TOA_100M	1315.35
PROBAV_L3_S1_TOC_100M	1734.43
PROBAV_L3_S1_TOC_NDVI_100M	0.02
PROBAV_L3_S5_TOA_100M	4.44
PROBAV_L3_S5_TOC_100M	79.19
PROBAV_L3_S5_TOC_NDVI_100M	14.68
PROBAV_L3_S1_TOA_300M	1525.06
PROBAV_L3_S1_TOC_300M	238.98
PROBAV_L3_S10_TOC_300M	20.19
PROBAV_L3_S10_TOC_NDVI_300M	32.11
PROBAV_L3_S1_TOA_1KM	13.24
PROBAV_L3_S1_TOC_1KM	22.01
PROBAV_L3_S10_TOC_1KM	2.98
PROBAV_L3_S10_TOC_NDVI_1KM	1.76

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

Company	# Downloads
EOSENSE	678
JOINT RESEARCH CENTRE	224
ICMBIO	145
KU LEUVEN	142
VITO	136
HOCHSCHULE KARLSRUHE TECHNIK UND WIRTSCHAFT	135
DESCARTES UNDERWRITING	123
UCLOUVAIN	112
SHANDONG FORESTRY SCIENCE RESEARCH INSTITUTE	85
INSTITUTE OF GEOGRAPHICAL SCIENCES RESEARCH,	72

Table 9: Top 10 user companies for the reporting period

Country	# Users
CHINA	209
BELGIUM	167
INDIA	96
FRANCE	91
BRAZIL	84
UNITED STATES	82
ITALY	80
NETHERLANDS	67
UNITED KINGDOM	64
GERMANY	61

Table 10: Top 10 countries with most registered users

List of issues raised by users:

No helpdesk tickets recorded this reporting period

4. Image Calibration services

4.1. Radiometric Calibration

Calibration request type	Total	Processed	Not received	Error
CLOUDS	24	23	0	1
DARK CURRENT	15	15	0	0
MOON	2	2	0	0
RAYLEIGH	34	32	0	2
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	2	0
PROBA-V_L1B_CALIBRATION	210	160	50
PROBA-V_L1B_INTERSECTION	627	422	192
PROBA-V_L1B_OVERLAPREGION	0	0	0

Table 12: Processed calibration images for this reporting period

Radiometric ICP file

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. For the LEFT camera a slight increasing trend is observed. We assume that this might be due to uncertainties in the OSCAR desert model combined with the orbital drift of PROBA-V. For the CENTER camera no clear trend is observed.

One bad pixel has been identified: RIGHT SWIR1 pixel ID 647

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. RIGHT SWIR1 pixel ID 647)

- PROBAV_ICP_RADIOMETRIC#LEFT_20210701_V01
- PROBAV_ICP_RADIOMETRIC#CENTER_20210701_V01
- PROBAV_ICP_RADIOMETRIC#RIGHT_20210701V01

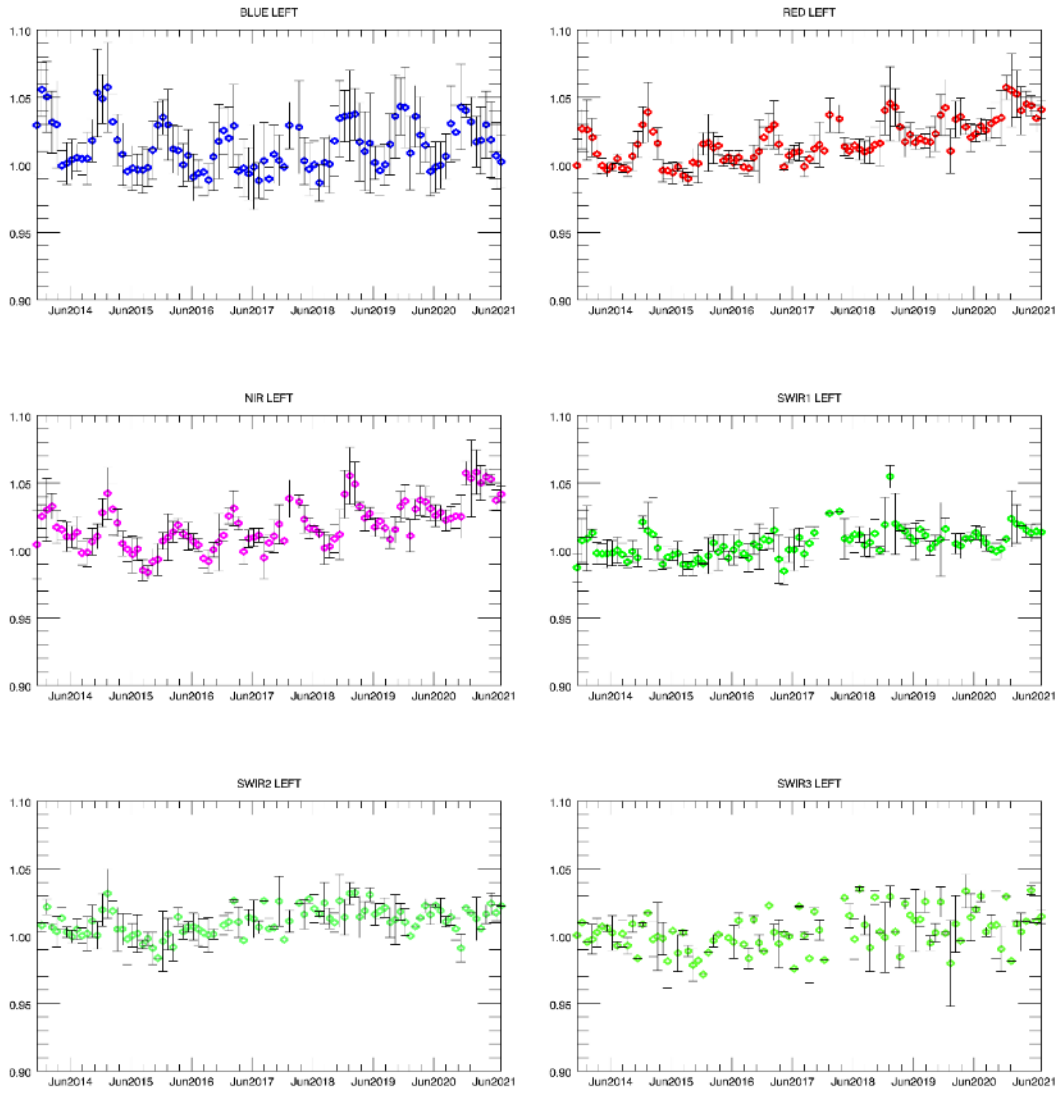

Figure 1. Libya-4 desert calibration results: LEFT monthly averaged results (collection 1)

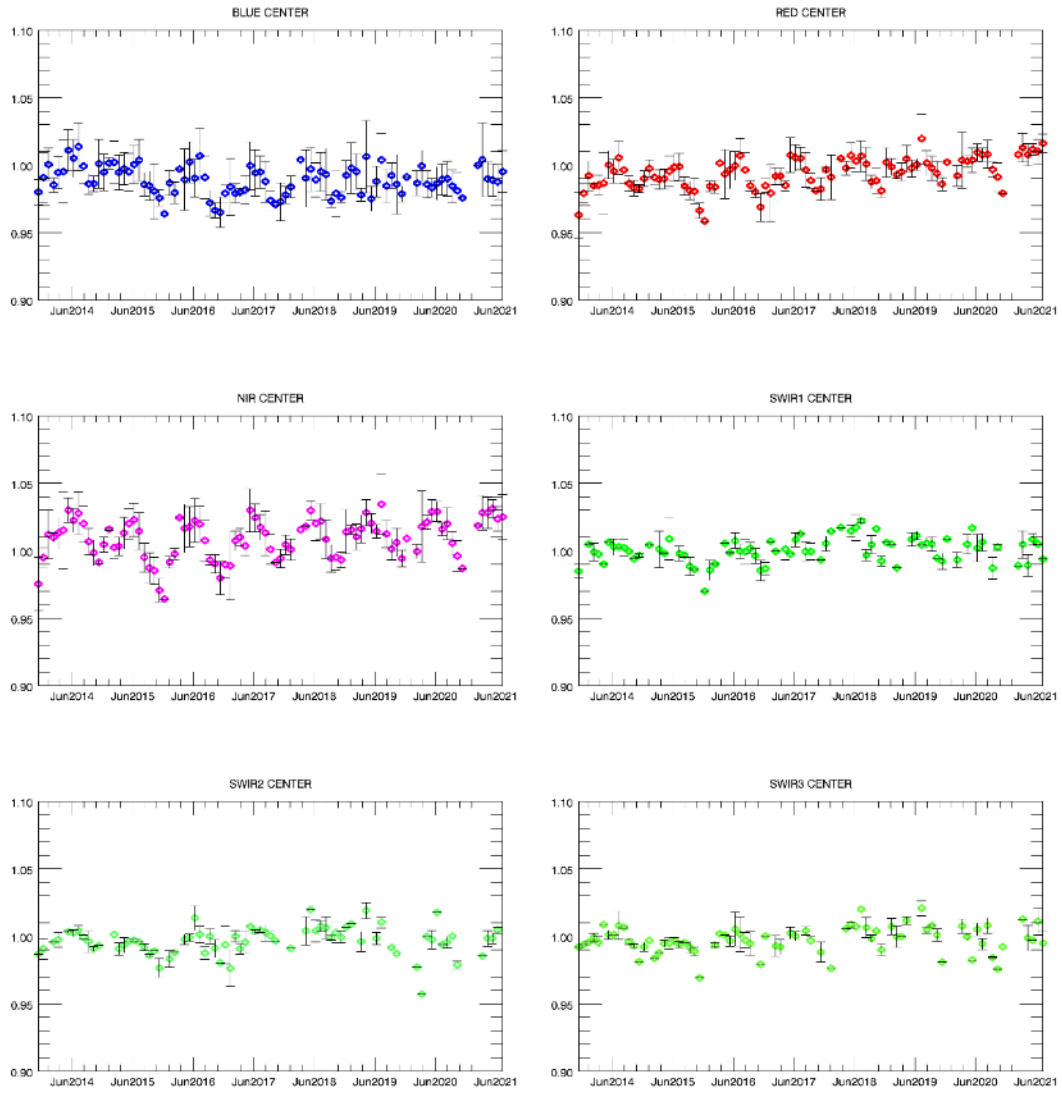

Figure 2. Libya-4 desert calibration results: CENTER monthly averaged results (collection 1)

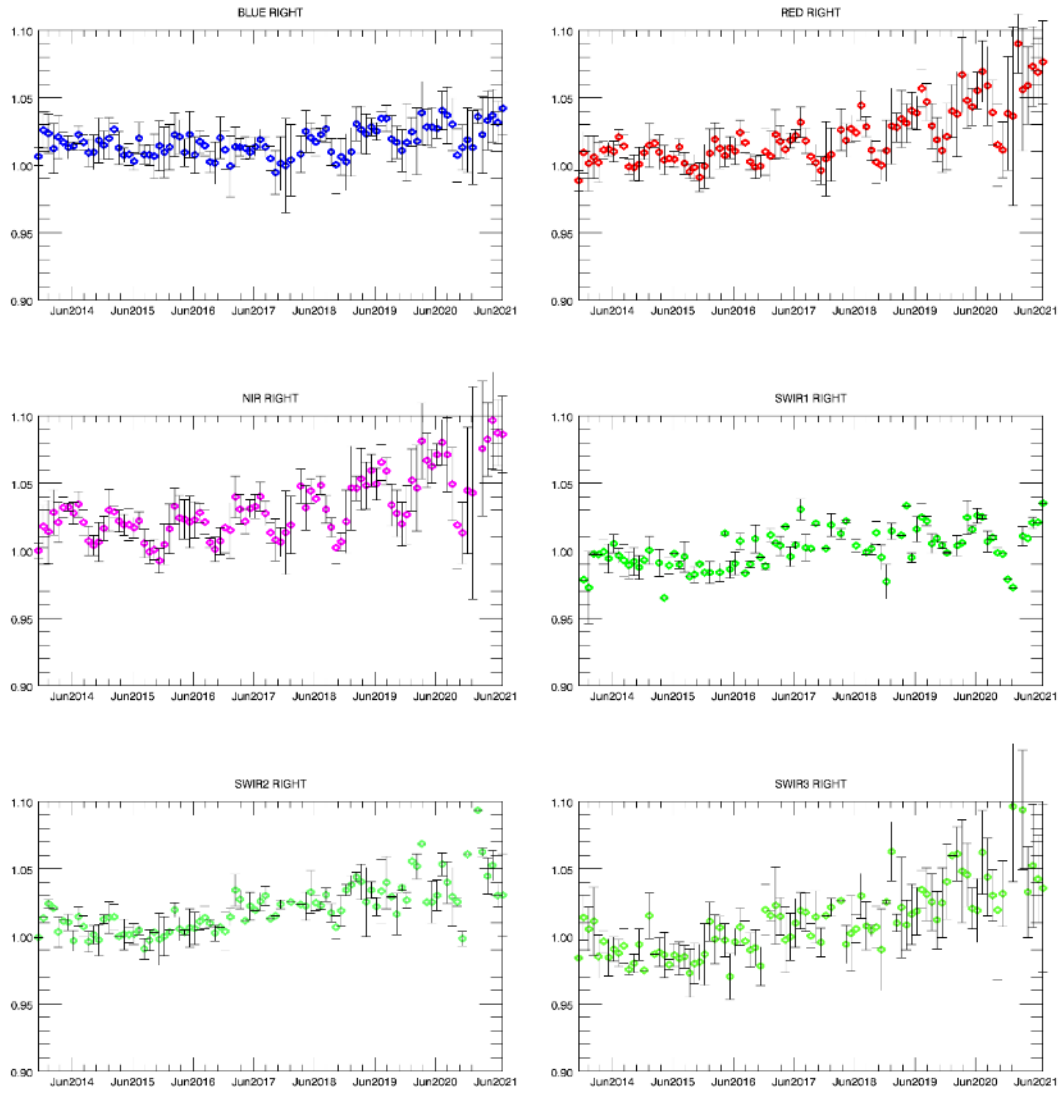

Figure 3. Libya-4 desert calibration results: RIGHT monthly averaged results (collection 1)

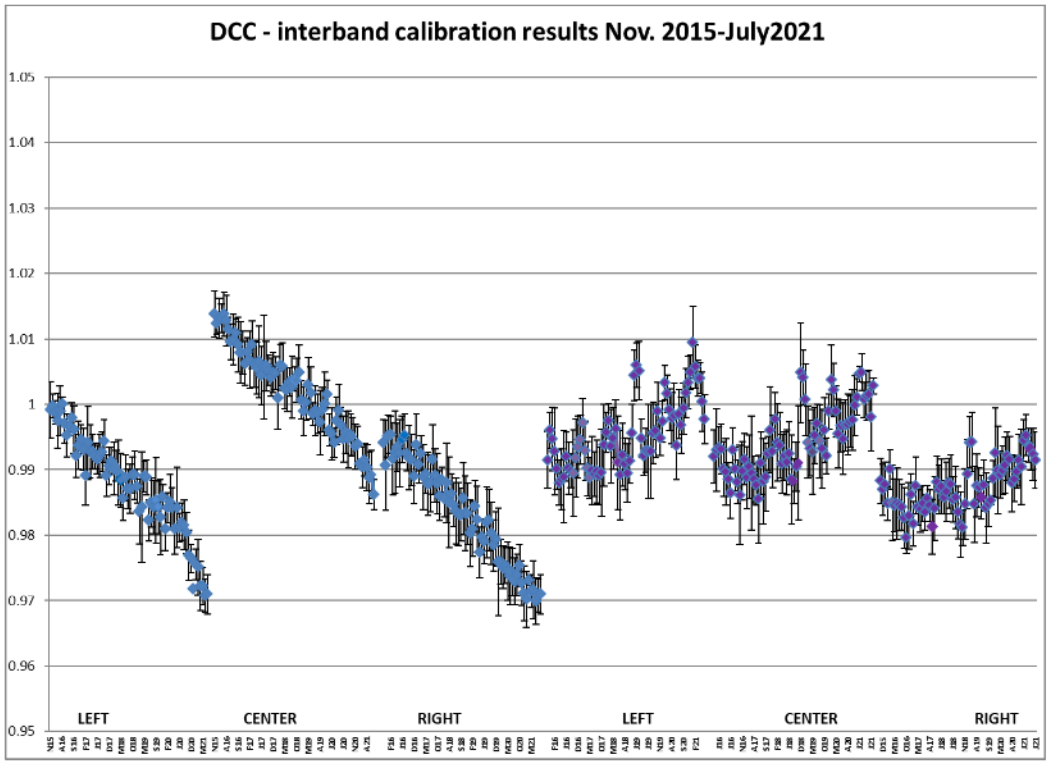

Figure 4. DCC inter-band calibration results: LEFT, CENTER and RIGHT camera (collection 1)

4.2. Geometric Calibration

Calibration image type	Total	Processed	Error
PROBA-V_L1C_INTERSECTION	4128	4128	0

Table13: Processed calibration images for this reporting period

During the reporting period, the average ALE was < 69 m (σ < 99 m).
The daily ALE evolution (Figure X) shows values within 55 - 75 m for all bands.

The average compliance was 99.16% (98.58% - 99.64% for BLUE - SWIR).
Minimum compliance values were 97.99% - 99.42% (BLUE - SWIR)

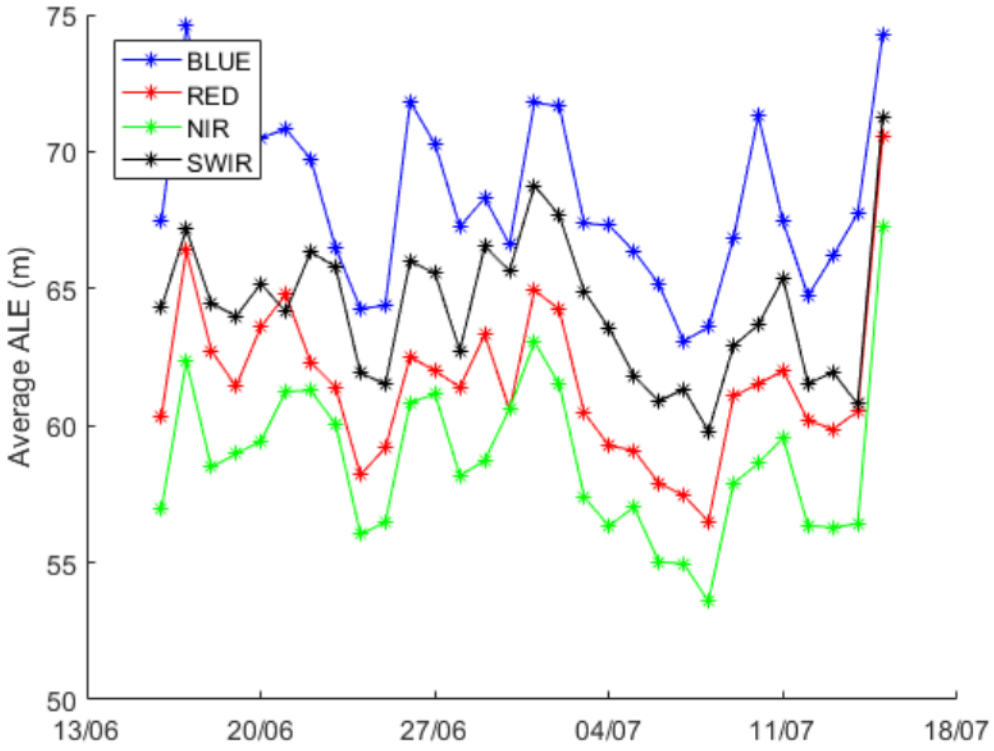

Figure 5: *daily ALE evolution for 16/6 - 15/7/2021.*

5. Anomalies

5.1. System related issues

A detailed description of each issue is available in the issue tracking system http://jira.vgt.vito.be

- **0** new issues were logged during this reporting period
- **0** issue(s) was resolved and closed during this reporting period
- **2** issues are resolved but remain to be closed formally
- **2** issues are resolved but remain in the list logging purposes
- **5** issue(s) is open and remain to be solved

5.2. 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	13/07, 08/07, 18/06, 03/07, 23/06, 28/06, 21/06, 16/06, 11/07, 01/07, 06/07, 26/06, 04/07, 14/07, 29/06, 09/07, 19/06, 24/06, 22/06, 27/06, 17/06, 07/07, 12/07, 02/07, 15/07, 10/07, 05/07, 25/06, 20/06, 30/06
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
20210616	65.71%	8	2					
20210617	66.27%	10						
20210618	66.04%	7	1					
20210619	66.17%	7						
20210620	65.08%	10						
20210621	66.31%	4				1		
20210622	66.54%	10						
20210623	66.28%	9						
20210624	65.81%	9	4					
20210625	65.65%	8	1					
20210626	66.25%	7						
20210627	66.16%	4	4					
20210628	66.50%	6	8					
20210629	65.51%	6	9					
20210630	66.25%	1	5					
20210701	66.47%	6	3					
20210702	66.33%	5						
20210703	65.81%	8	1					
20210704	65.47%	7	7					
20210705	66.27%	4	1					
20210706	66.07%	5						
20210707	66.26%	8	1				7	
20210708	65.28%	7	1				6	
20210709	65.95%	6						
20210710	66.25%	9						
20210711	66.31%	13	3					
20210712	66.06%	9	1					
20210713	64.50%	10	4					
20210714	66.26%	9						
20210715	N/A	7	3					

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

- The Collection 2 reprocessing activity kicked off in the last month with processing 1 year of data (July 2018 – June 2019).

7. Operational remarks

No operational remarks