



# MONTHLY OPERATIONS REPORT

**MOR#092**

**Reporting period from 16-Jul-2021 to 15-Aug-2021**

Reference: *PROBA-V\_D5\_MOR-092\_08\_v1.0*

Author(s): Dennis Clarijs, Sindy Sterckx, Erwin Wolters, Jan Vanhout

Version: 1.0

Date: 19/08/2021

## DOCUMENT CONTROL

### Signatures

Author(s) Dennis Clarijs, Sindy Sterckx, Erwin Wolters, Jan Vanhout

Reviewer(s) Dennis Clarijs

Approver(s) Dennis Clarijs

Issuing authority

### Change record

Release	Date	Pages	Description	Editor(s)/Reviewer(s)
1.0	19/08/2021	All	Initial version	



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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.

Some downtime has been recorded in the production workflows due to a planned update of all network switches in the data center and the limited availability of key personnel in the holiday period.

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 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	99.99	0.01
Database Servers	100.0	0.0
Mid Term File Servers	99.99	0.01
Short Term File Servers	99.99	1.0
Master Servers	100.0	0.0
Worker Nodes	99.99	0.01
PDF	99.99	0.01

Table 1: System Infrastructure availability for this reporting period

(\*) Planned firmware update of switches on 26/07/2021

## 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	93	91	2 <sup>(*)</sup>	91

Table 2: Ingested and archived products for this reporting period

(\*) TFF 26035 + TFF 26047: transaction had no content

### 3.2. Generated and archived products

Product Type	Total	Processed	Error	Archived
PROBAV_L1A - Calibration	247	247	0	247
PROBAV_L1A - Nominal	634	634	0	634
PROBAV_L1C	634	634	0	634
PROBAV_L2A_100M	227	227	0	227
PROBAV_L2A_300M	634	634	0	634
PROBAV_L2A_1KM	634	634	0	634
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	90	255.35
L1A	820	432.34
Database transaction logs	480	25.53
Database incremental back-up	26	5.42
Database full back-up	5	317.87

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

Product type	Total Files	Total File Size (GB)
PROBAV_TRANSFERFRAMES	79	248.51
PROBAV_L1A	771	442.48
PROBAV_L1C	546	769.17
PROBAV_L2A_100M	388	359.89
PROBAV_L2A_300M	1097	196.27
PROBAV_L2A_1KM	1097	25.79
PROBAV_L3_S1_TOA_100M	54	390.45
PROBAV_L3_S1_TOC_100M	54	406.75
PROBAV_L3_S1_TOC_NDVI_100M	54	48.11
PROBAV_L3_S5_TOA_100M	10	284.13
PROBAV_L3_S5_TOC_100M	10	296.32
PROBAV_L3_S5_TOC_NDVI_100M	10	34.22
PROBAV_L3_S1_TOA_300M	54	186.12
PROBAV_L3_S1_TOC_300M	54	192.18
PROBAV_L3_S10_TOC_300M	4	23.92
PROBAV_L3_S10_TOC_NDVI_300M	4	2.12
PROBAV_L3_S1_TOA_1KM	54	24.94
PROBAV_L3_S1_TOC_1KM	54	25.57
PROBAV_L3_S10_TOC_1KM	4	3.20
PROBAV_L3_S10_TOC_NDVI_1KM	4	0.27
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	218	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	633	814	810
PROBAV_L2A_100M	226	0	1
PROBAV_L2A_300M	638	5	9
PROBAV_L2A_1KM	637	0	0
PROBAV_L3_S1_TOA_100M	29	40	42
PROBAV_L3_S1_TOC_100M	29	52	1262
PROBAV_L3_S1_TOC_NDVI_100M	29	0	2
PROBAV_L3_S5_TOA_100M	6	0	2
PROBAV_L3_S5_TOC_100M	6	80	593
PROBAV_L3_S5_TOC_NDVI_100M	6	150	526
PROBAV_L3_S1_TOA_300M	28	174	175
PROBAV_L3_S1_TOC_300M	29	29	95
PROBAV_L3_S10_TOC_300M	3	3	3
PROBAV_L3_S10_TOC_NDVI_300M	3	0	2091
PROBAV_L3_S1_TOA_1KM	29	29	31
PROBAV_L3_S1_TOC_1KM	29	29	76
PROBAV_L3_S10_TOC_1KM	3	7	6
PROBAV_L3_S10_TOC_NDVI_1KM	3	12	11

Table 6: Ordered and delivered products for this reporting period

### 3.5. End-user activity

3 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 **1961** with **123** different nationalities representing **1421** different companies/universities.

Product type	Africa	Asia	Europe	N-America	Oceania	S-America
PROBAV_L1C	0	0	1058.53	0	0	0
PROBAV_L2A_100M	0	0	0.01	0	0	0
PROBAV_L2A_300M	0	0	3.28	0	0	0
PROBAV_L2A_1KM	0	0	0	0	0	0
PROBAV_L3_S1_TOA_100M	0	0	777.44	0	0	0
PROBAV_L3_S1_TOC_100M	0	0.56	1349.12	197.68	0	0
PROBAV_L3_S1_TOC_NDVI_100M	0	0.03	0.01	0	0	0
PROBAV_L3_S5_TOA_100M	0	0	0	0	0	0
PROBAV_L3_S5_TOC_100M	16.71	44.22	68.46	0	0	0
PROBAV_L3_S5_TOC_NDVI_100M	0.50	25.36	0	0	0	0
PROBAV_L3_S1_TOA_300M	0	0	85.79	0	0	1483.07
PROBAV_L3_S1_TOC_300M	0	0	164.19	94.63	0	0
PROBAV_L3_S10_TOC_300M	0	0	17.95	0	0	0
PROBAV_L3_S10_TOC_NDVI_300M	0	0	95.83	0	0	0
PROBAV_L3_S1_TOA_1KM	0	0	12.71	0	0	0
PROBAV_L3_S1_TOC_1KM	0	0	23.66	0	0	0
PROBAV_L3_S10_TOC_1KM	0.57	0	2.49	0	0	0
PROBAV_L3_S10_TOC_NDVI_1KM	0.00	0.00	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	1058.53
PROBAV_L2A_100M	0.01
PROBAV_L2A_300M	3.28
PROBAV_L2A_1KM	0
PROBAV_L3_S1_TOA_100M	777.44
PROBAV_L3_S1_TOC_100M	1547.36
PROBAV_L3_S1_TOC_NDVI_100M	0.04
PROBAV_L3_S5_TOA_100M	0
PROBAV_L3_S5_TOC_100M	129.39
PROBAV_L3_S5_TOC_NDVI_100M	25.86
PROBAV_L3_S1_TOA_300M	1568.86
PROBAV_L3_S1_TOC_300M	258.82
PROBAV_L3_S10_TOC_300M	17.95
PROBAV_L3_S10_TOC_NDVI_300M	95.83
PROBAV_L3_S1_TOA_1KM	12.71
PROBAV_L3_S1_TOC_1KM	23.66
PROBAV_L3_S10_TOC_1KM	3.05
PROBAV_L3_S10_TOC_NDVI_1KM	0.02

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

Company	# Downloads
JOINT RESEARCH CENTRE	2091
VISIOTERRA	1145
EOSENSE	673
NJU	427
HHU	377
KU LEUVEN	158
SHANDONG FORESTRY SCIENCE RESEARCH INSTITUTE	145
ICMBIO	145
VITO	137
HOCHSCHULE KARLSRUHE TECHNIK UND WIRTSCHAFT	137

Table 9: Top 10 user companies for the reporting period

Country	# Users
CHINA	210
BELGIUM	167
INDIA	96
FRANCE	91
BRAZIL	84
UNITED STATES	82
ITALY	80
NETHERLANDS	68
UNITED KINGDOM	64
GERMANY	61

Table 10: Top 10 countries with most registered users

**List of issues raised by users:**

PDF: N.A. - DANRA romaric - 2021/7/26 - Forests  
Proba-V's use of X-band  
Access to MODIS data

## 4. Image Calibration services

### 4.1. Radiometric Calibration

Calibration request type	Total	Processed	Not received	Error
CLOUDS	57	22	35	0
DARK CURRENT	34	14	20	0
MOON	28	9	19	0
RAYLEIGH	78	32	46	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	10	9	1
PROBA-V_L1B_CALIBRATION	237	191	40
PROBA-V_L1B_INTERSECTION	681	450	213
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.

Results are similar as for previous months: very strong seasonal variations in the Libya-4 results for mainly the RIGHT camera. For the LEFT camera a slight increasing trend is observed. The Center camera results are stable. It is assumed 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: LEFT SWIR1 pixel ID 344

A series of lunar acquisitions has been scheduled covering the full lunar phase to support the LIME lunar calibration model development.

#### 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. LEFT SWIR1 pixel ID 344)

The current ICP files are:

- PROBAV\_ICP\_RADIOMETRIC#LEFT\_20210801\_V01
- PROBAV\_ICP\_RADIOMETRIC#CENTER\_20210801\_V01
- PROBAV\_ICP\_RADIOMETRIC#RIGHT\_20210801V01

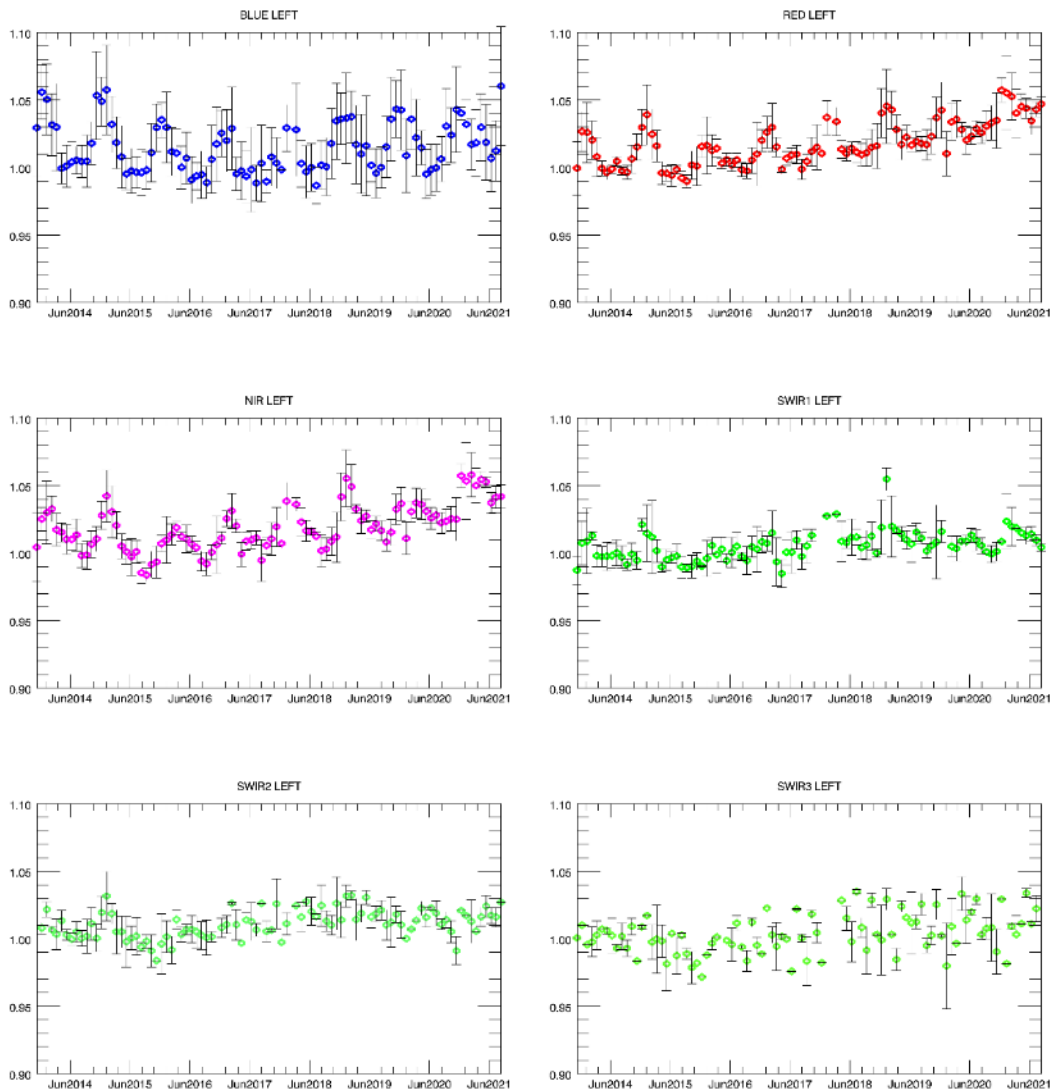


Figure 1. Libya-4 desert calibration results: LEFT monthly averaged results (collection 1)

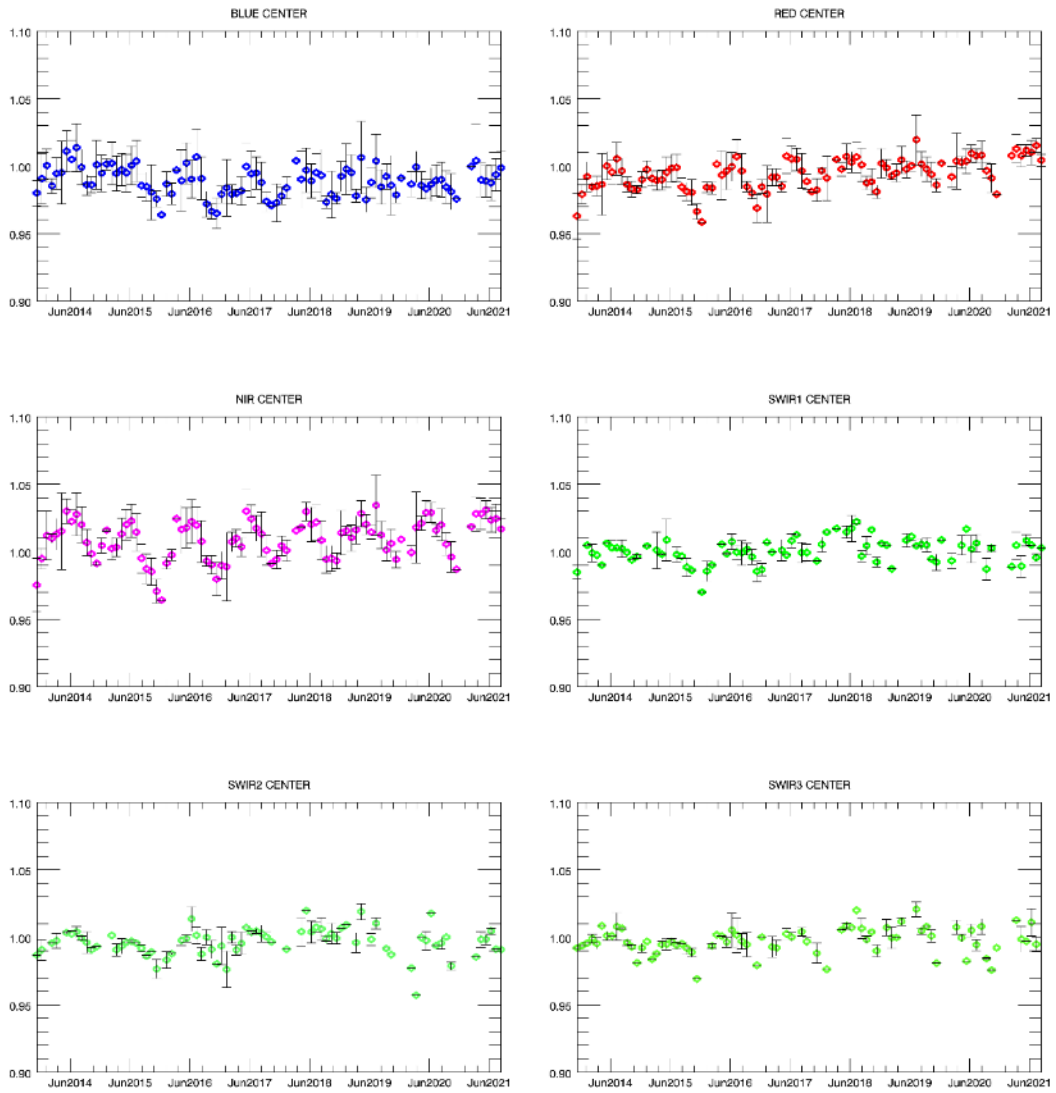


Figure 2. Libya-4 desert calibration results: CENTER monthly averaged results (collection 1)

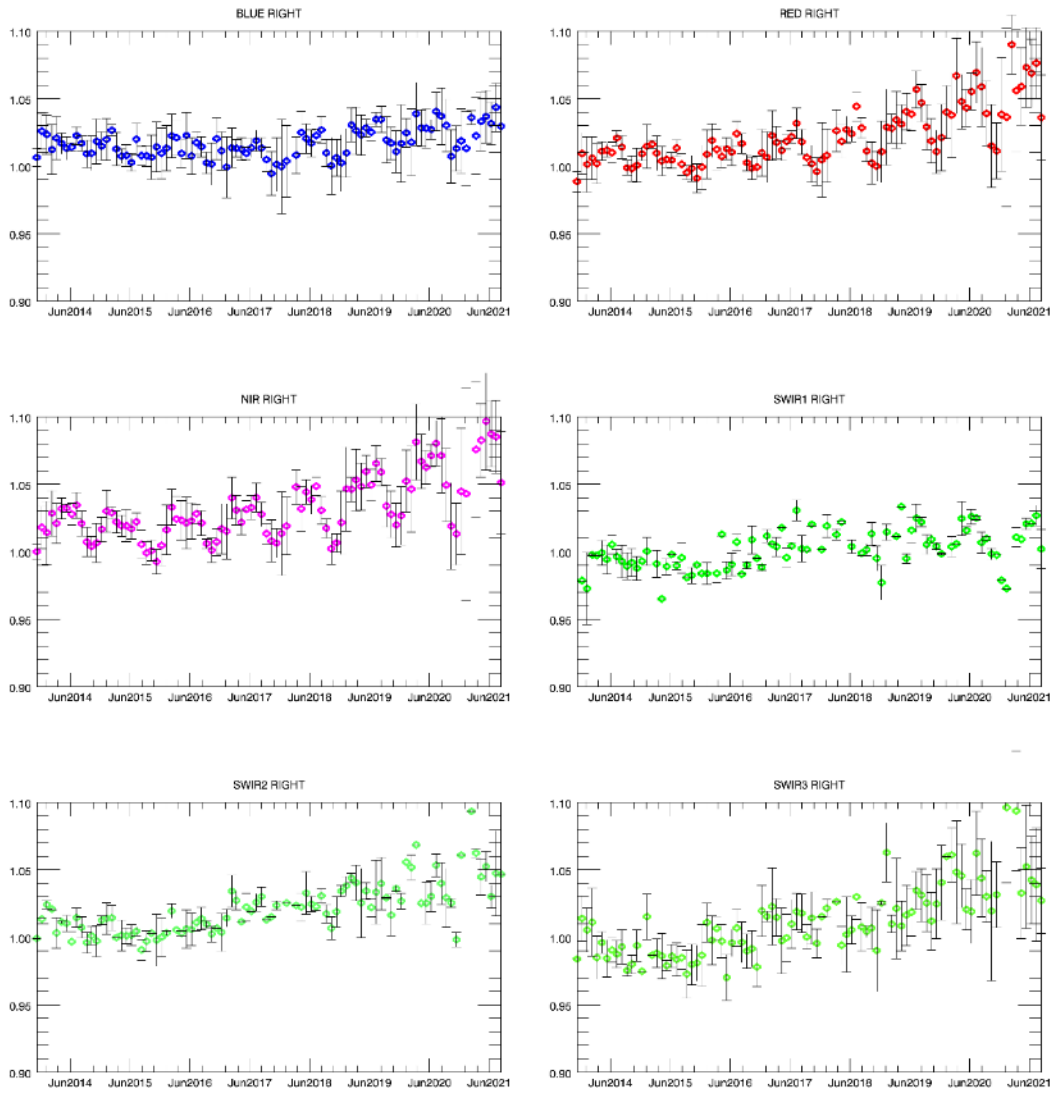


Figure 3. Libya-4 desert calibration results: RIGHT monthly averaged results (collection 1)

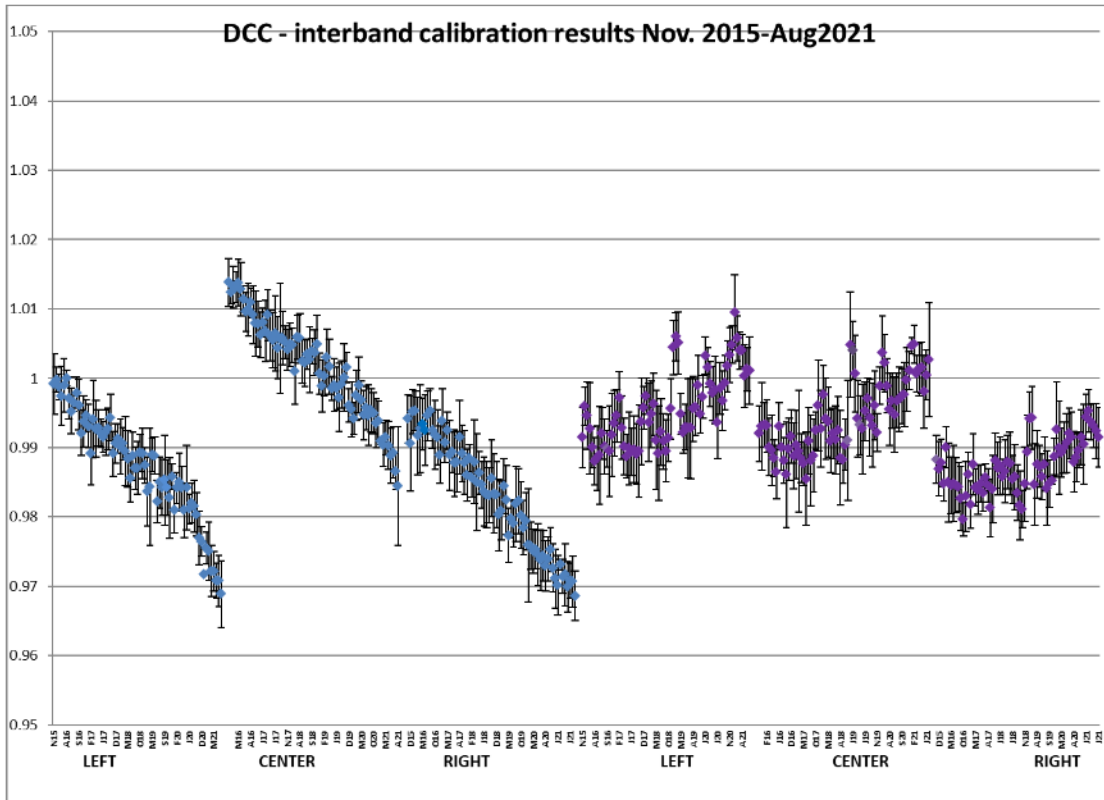


Figure 4. DCC inter-band calibration results: LEFT, CENTER and RIGHT camera (collection 1)

## 4.2. Geometric Calibration

Calibration image type	Total	Processed	Error
PROBA-V_L1C_INTERSECTION	4179	4179	0

Table13: Processed calibration images for this reporting period

During the reporting period 16/7 – 15/8/2021, the average ALE was < 70 m ( $\sigma < 96$  m). The daily ALE evolution remained very stable, with no major peaks observed and for all bands values fluctuated between 55 – 80 m, see Figure 5.

The average daily compliance was 99.14% (98.63% - 99.64% for BLUE – SWIR), with minimum values of 98.05% - 99.38%.

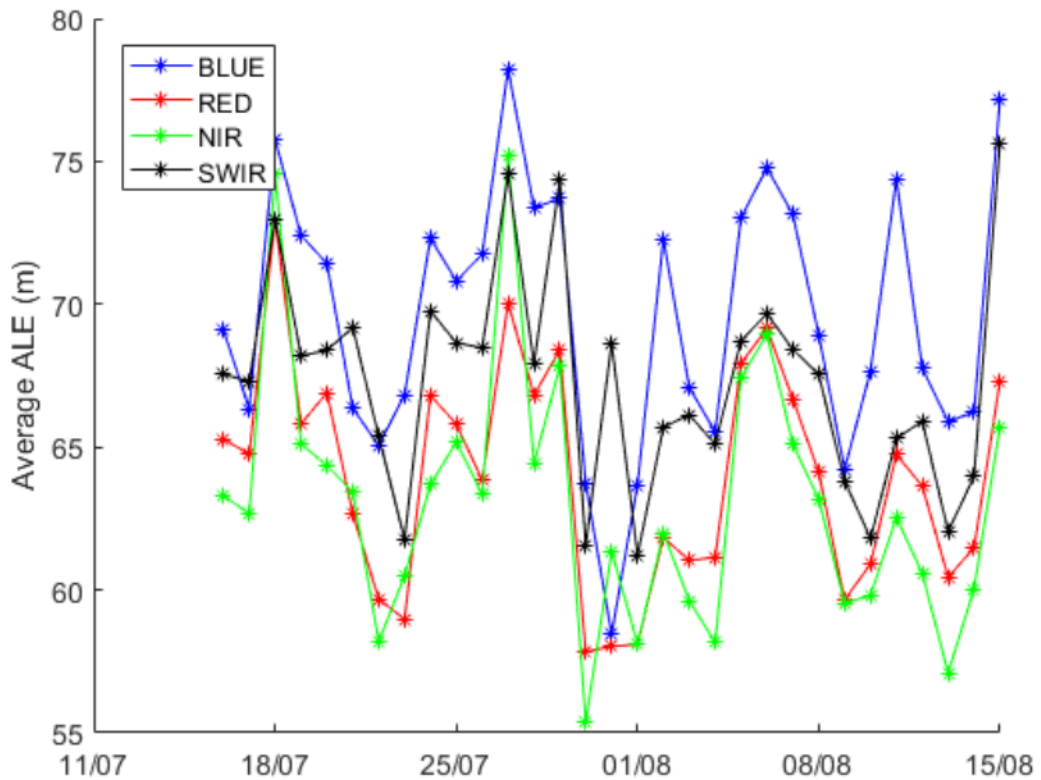


Figure 5: Daily ALE compliance for 16/7 – 15/8/2021.



## 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 <sup>2</sup> (missing TFF))	0	
Large Gaps (< 21600 km <sup>2</sup> )	0	
Medium Gaps (< 10000 km <sup>2</sup> )	2	31/07, 27/07
Minor Gaps (< 3600 km <sup>2</sup> )	0	
Negligible Gaps (< 1000 km <sup>2</sup> )	29	02/08, 18/07, 28/07, 23/07, 07/08, 12/08, 26/07, 21/07, 05/08, 16/07, 15/08, 10/08, 19/07, 08/08, 13/08, 03/08, 29/07, 24/07, 01/08, 17/07, 06/08, 11/08, 22/07, 30/07, 25/07, 20/07, 14/08, 04/08, 09/08
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
20210716	66.27%	7						
20210717	65.57%	8	5					
20210718	65.92%	8	5					
20210719	66.20%	4	3					
20210720	66.19%	11	3					
20210721	66.01%	7	4					
20210722	64.49%	8	3					
20210723	66.29%	5	4					
20210724	66.18%	4	6					
20210725	66.35%	7	1					
20210726	65.48%	5						
20210727	69.18%	3		1				
20210728	66.24%	5						
20210729	66.82%	2	8					
20210730	65.97%	5	9					
20210731	72.53%	14	5	1				
20210801	66.18%	6	2					
20210802	66.18%	15	1					
20210803	66.43%	7	9					
20210804	65.58%	5	2					
20210805	65.67%	4						
20210806	66.16%	13	4					
20210807	66.04%	9	1					
20210808	65.99%	7						
20210809	64.81%	8	5					
20210810	66.21%	3	7					
20210811	66.18%	4	2					
20210812	66.34%	4	7					
20210813	65.71%	8	2					
20210814	65.83%	2	5					
20210815	66.06%	7	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
- The Collection 2 reprocessing activity kicked off in the last month with processing 1 year of data (July 2018 – June 2019) and continues to be one of the focus points in the coming weeks and months.

## 7. Operational remarks

No operational remarks