proba-v

MONTHLY OPERATIONS REPORT

MOR#084

Reporting period from 16-Nov-2020 to 15-Dec-2020

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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, although we see a slight seasonal increase in the amount of geometric errors.

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. 10 new users registered and downloaded data in this period.

Preparation of the development of collection 2 workflows are further implemented, with main focus on the new A/C algorithm and preparation of the new reprocessing environment.

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	99.9	0.1(*)
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

(*) pstfs32: down with 2 broken fans

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	196	196	0	196
PROBAV_L1A - Nominal	531	530	1(*)	531
PROBAV_L1C	530	530	0	530
PROBAV_L2A_100M	173	173	0	173
PROBAV_L2A_300M	530	530	0	530
PROBAV_L2A_1KM	530	530	0	530
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

(*) 1 x L1A error due geometric processing

3.3. Backup and archiving service

Product type	Total Files	Total File Size (GB)
TFF	87	239.83
L1A	704	431.68
Database transaction logs	820	39.15
Database incremental back-up	50	11.32
Database full back-up	12	632.92

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

Product type	Total Files	Total File Size (GB)
PROBAV_TRANSFERFRAMES	90	267.04
PROBAV_L1A	730	480.72
PROBAV_L1C	530	830.85
PROBAV_L2A_100M	347	350.55
PROBAV_L2A_300M	1060	201.48
PROBAV_L2A_1KM	1060	26.30
PROBAV_L3_S1_TOA_100M	62	393.35
PROBAV_L3_S1_TOC_100M	62	344.87
PROBAV_L3_S1_TOC_NDVI_100M	62	40.90
PROBAV_L3_S5_TOA_100M	12	320.88
PROBAV_L3_S5_TOC_100M	13	328.25
PROBAV_L3_S5_TOC_NDVI_100M	12	34.05
PROBAV_L3_S1_TOA_300M	62	202.99
PROBAV_L3_S1_TOC_300M	62	188.06
PROBAV_L3_S10_TOC_300M	6	32.61
PROBAV_L3_S10_TOC_NDVI_300M	6	2.78
PROBAV_L3_S1_TOA_1KM	62	26.79
PROBAV_L3_S1_TOC_1KM	62	24.99
PROBAV_L3_S10_TOC_1KM	6	4.28
PROBAV_L3_S10_TOC_NDVI_1KM	6	0.34
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	240	0.30
METEO_METEOSERVICES	239(*)	1.27
POLARMOTION	1	0.00

Table 5: Archived data volumes for this reporting period

(*) 1 meteofile meteoservices not delivered

3.4. Dissemination service

Product type	Added to catalogue	Ordered	Delivered
PROBAV_L1C	530	1452	1454
PROBAV_L2A_100M	174	0	0
PROBAV_L2A_300M	530	3	619
PROBAV_L2A_1KM	530	0	0
PROBAV_L3_S1_TOA_100M	31	91	88
PROBAV_L3_S1_TOC_100M	31	160	267
PROBAV_L3_S1_TOC_NDVI_100M	31	0	8
PROBAV_L3_S5_TOA_100M	6	2	17
PROBAV_L3_S5_TOC_100M	6	203	297
PROBAV_L3_S5_TOC_NDVI_100M	6	1870	1945
PROBAV_L3_S1_TOA_300M	31	237	237
PROBAV_L3_S1_TOC_300M	31	63	146
PROBAV_L3_S10_TOC_300M	3	14	14
PROBAV_L3_S10_TOC_NDVI_300M	3	516	903
PROBAV_L3_S1_TOA_1KM	31	136	136
PROBAV_L3_S1_TOC_1KM	31	136	206
PROBAV_L3_S10_TOC_1KM	3	7	7
PROBAV_L3_S10_TOC_NDVI_1KM	3	488	485

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 **1880** with **122** different nationalities representing **1364** different companies/universities.

Product type	Africa	Asia	Europe	N-America	Oceania	S-America
PROBAV_L1C	0	2.27	1492.36	0	0	0
PROBAV_L2A_100M	0	0	0	0	0	0
PROBAV_L2A_300M	0	0.05	143.79	0	0	0
PROBAV_L2A_1KM	0	0	0	0	0	0
PROBAV_L3_S1_TOA_100M	0	0.01	1400.71	0	0	0.01
PROBAV_L3_S1_TOC_100M	0	157.17	2450.91	157.12	0	0
PROBAV_L3_S1_TOC_NDVI_100M	0	0.01	0.35	0	0	0
PROBAV_L3_S5_TOA_100M	5.68	0.81	0	0	0	0
PROBAV_L3_S5_TOC_100M	21.44	2681.45	1.02	0	0	0
PROBAV_L3_S5_TOC_NDVI_100M	0	27.97	29.98	0	0	0
PROBAV_L3_S1_TOA_300M	0	0	174.89	0	0	1157.79
PROBAV_L3_S1_TOC_300M	0	0	307.59	81.91	0	0
PROBAV_L3_S10_TOC_300M	3.96	0	33.17	0	0	0
PROBAV_L3_S10_TOC_NDVI_300M	21.05	0	15.91	0	0	0
PROBAV_L3_S1_TOA_1KM	0	0.14	25.42	0	0	0
PROBAV_L3_S1_TOC_1KM	0	0.04	33.21	0	0	0
PROBAV_L3_S10_TOC_1KM	0.62	0	2.99	0	0	0
PROBAV_L3_S10_TOC_NDVI_1KM	0	0.88	0	0	0	0

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

Product Type	Global
L1C	1494.63
PROBAV_L2A_100M	0
PROBAV_L2A_300M	143.84
PROBAV_L2A_1KM	0
PROBAV_L3_S1_TOA_100M	1400.73
PROBAV_L3_S1_TOC_100M	2765.20
PROBAV_L3_S1_TOC_NDVI_100M	0.36
PROBAV_L3_S5_TOA_100M	6.49
PROBAV_L3_S5_TOC_100M	2703.90
PROBAV_L3_S5_TOC_NDVI_100M	57.95
PROBAV_L3_S1_TOA_300M	1332.68
PROBAV_L3_S1_TOC_300M	389.51
PROBAV_L3_S10_TOC_300M	37.12
PROBAV_L3_S10_TOC_NDVI_300M	36.97
PROBAV_L3_S1_TOA_1KM	25.56
PROBAV_L3_S1_TOC_1KM	33.25
PROBAV_L3_S10_TOC_1KM	3.61
PROBAV_L3_S10_TOC_NDVI_1KM	0.88

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

Company	# Downloads
EOSENSE	1448
SHANDONG FORESTRY SCIENCE RESEARCH INSTITUTE	1376
UNIVERSIDAD DE VALENCIA	616
BEIJING NORMAL UNIVERSITY	484
UNIVERSITY OF SALZBURG	479
JOINT RESEARCH CENTRE	387
UNIVERSITÉ DE PARIS	262
SASSCAL	254
UCLOUVAIN	197
ICMBIO	175

Table 9: Top 10 user companies for the reporting period

Country	# Users
CHINA	196
BELGIUM	164
INDIA	89
FRANCE	88
BRAZIL	84
UNITED STATES	82
ITALY	77
NETHERLANDS	63
UNITED KINGDOM	62
GERMANY	57

Table 10: Top 10 countries with most registered users

List of issues raised by users:

November reporting (*):
RE: Proba-V MEP / Terrascope: supported python interpreters
Job application_1601050110355_50052 aborted

December reporting
PDF: PROBA-V 100 M products - S5 TOC 100 m [C1] - ahnikfal - 2020/12/2 - Convert probav from HDF to GeoTIFF
About account
PDF: N.A. - caglar - 2020/11/19 - Helping
PDF: N.A. - getawsalzburg - 2020/11/19 - Order request

(*) In November 2020 reporting, the statistics were not beforehand, so are reported in this reporting period.

4. Image Calibration services

4.1. Radiometric Calibration

Calibration request type	Total	Processed	Not received	Error
CLOUDS	31	26	5	0
DARK CURRENT	0	0	0	0
MOON	1	1	0	0
RAYLEIGH	42	36	6	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	1	1	0
PROBA-V_L1B_CALIBRATION	195	120	75
PROBA-V_L1B_INTERSECTION	677	303	374
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.

A trend-break in the Libya-4 results for the RIGHT camera is observed: while over the last two years a clear positive trend was observed, a "sudden drop" is seen now since about 3 months. This might be linked to the orbital drift causing larger BRDF related seasonal changes not fully accounted for in the modelling.

1 new bad pixel was identified in RIGHT SWIR1 strip: Pixel ID 496 (0-based):

Radiometric ICP file

The BLUE LEFT/CENTER absolute calibration coefficients will be updated following a linear degradation model. Furthermore the dark currents will be updated and one bad pixel will be added (ie. pixel ID496 in the Right SWIR1 strip).

The current ICP files are:

- PROBAV_ICP_RADIOMETRIC#LEFT_20201201_V01
- PROBAV_ICP_RADIOMETRIC#CENTER_20201201_V01
- PROBAV_ICP_RADIOMETRIC#RIGHT_20201201_V01

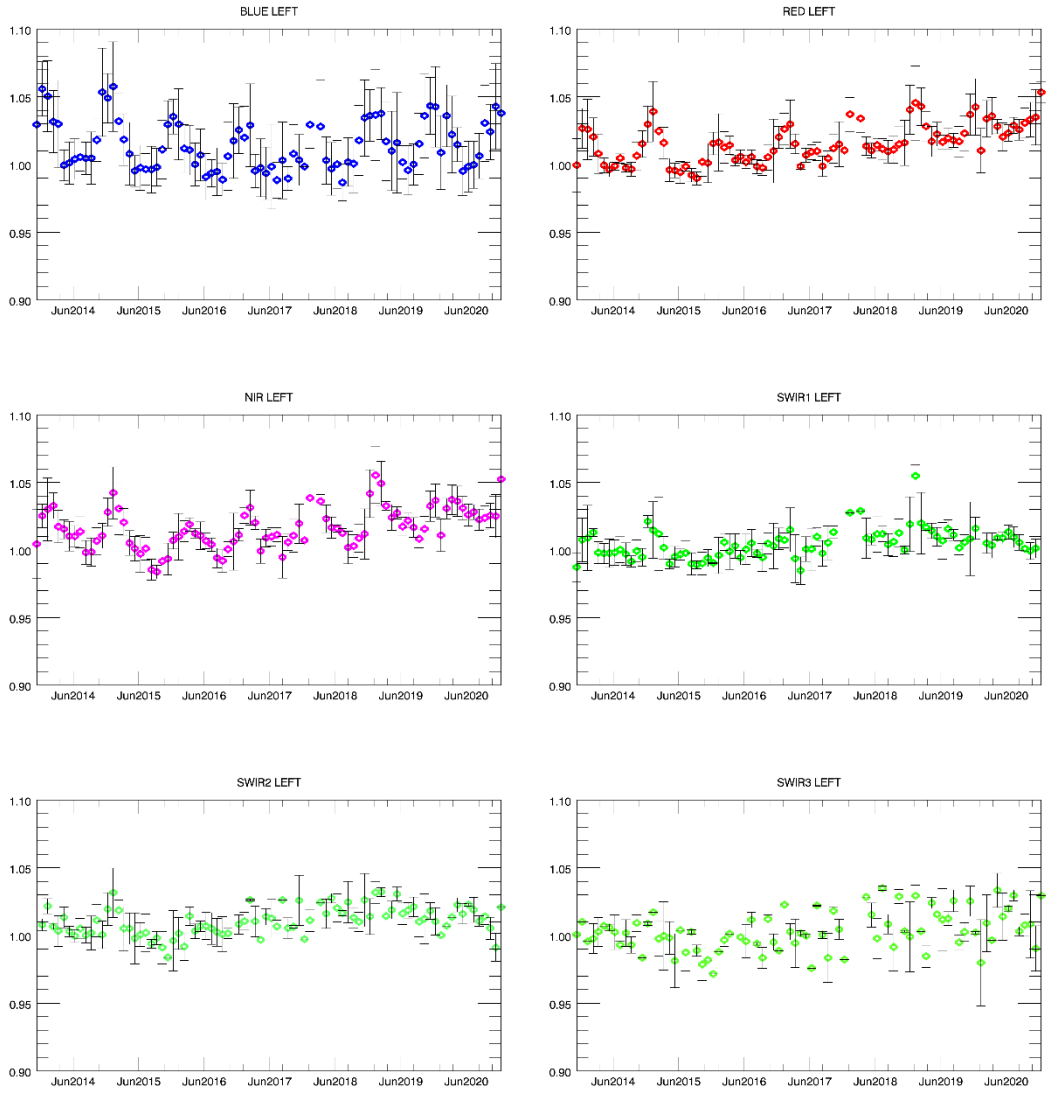

Figure 1. Libya-4 desert calibration results: LEFT monthly averaged results (collection 1)

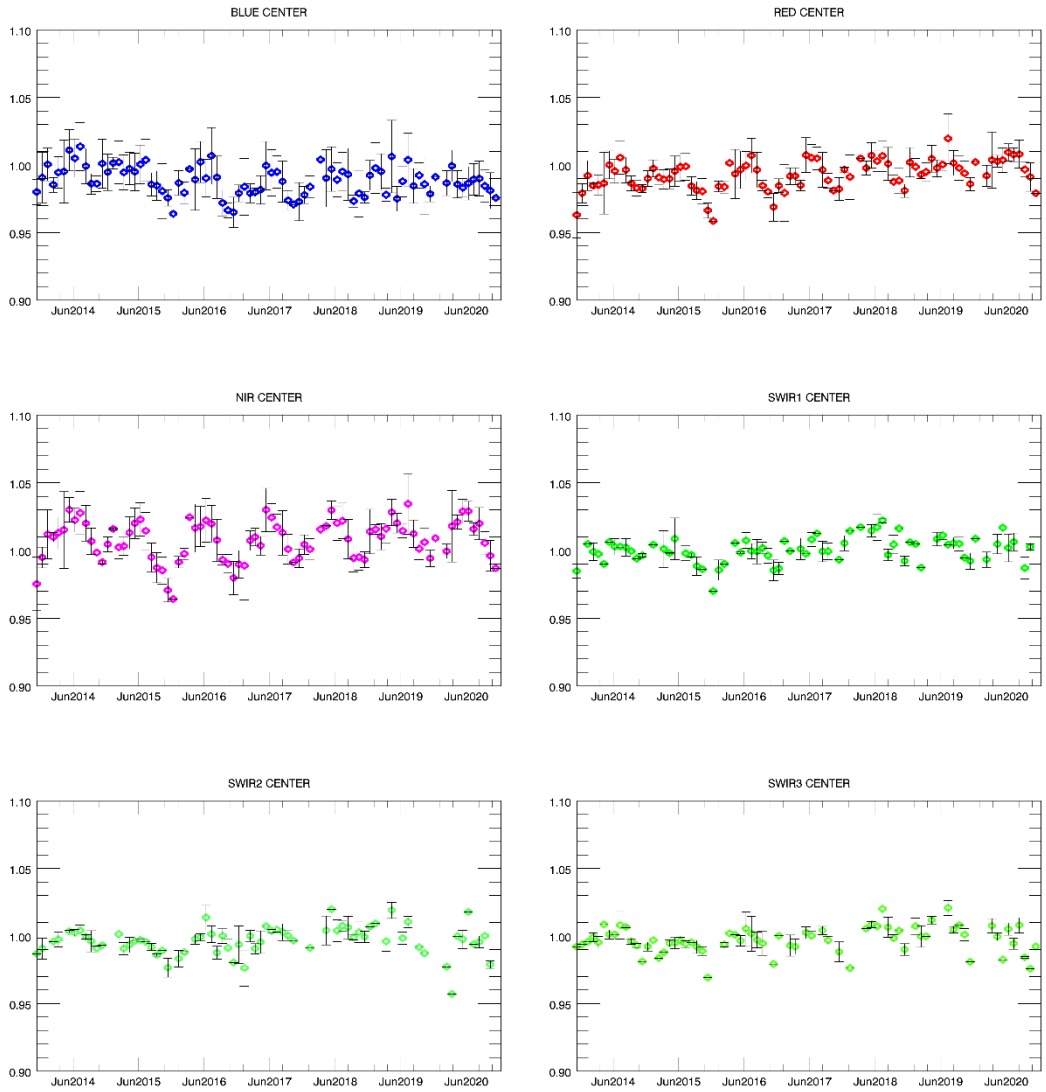

Figure 2. Libya-4 desert calibration results: CENTER monthly averaged results (collection 1)

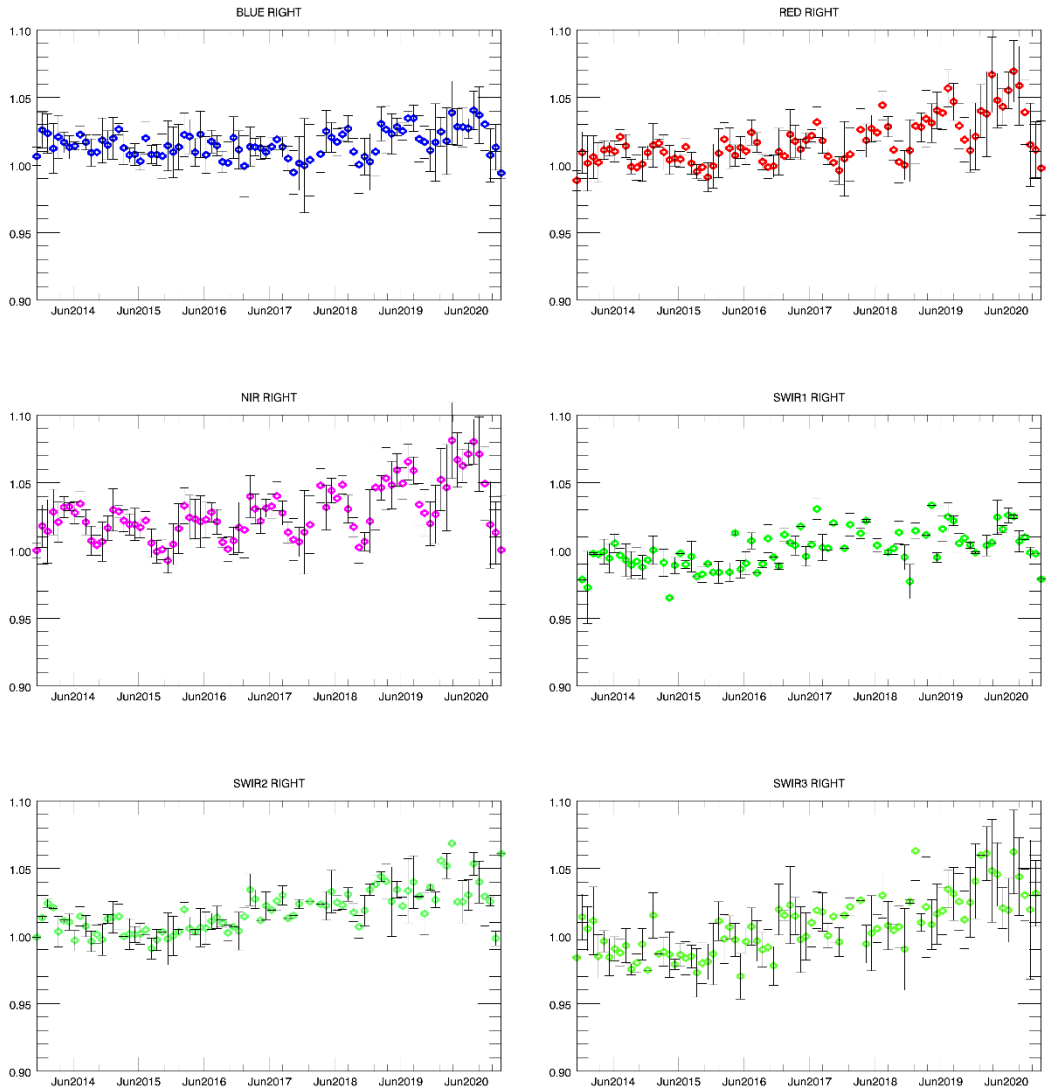

Figure 3. Libya-4 desert calibration results: RIGHT monthly averaged results (collection 1)

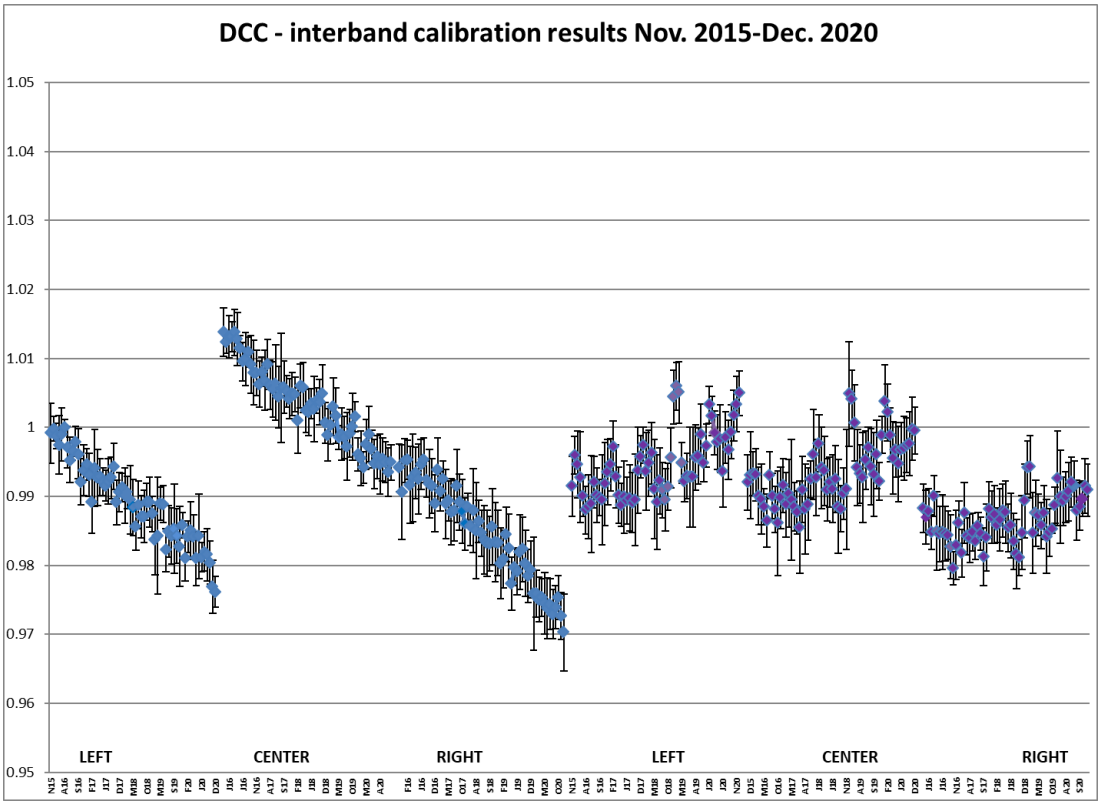

Figure 4. DCC inter-band calibration results: LEFT, CENTER and RIGHT camera (collection 1)

4.2. Geometric Calibration

Calibration image type	Total	Processed	Error
PROBA-V_L1C_INTERSECTION	3844	3844	0

Table13: Processed calibration images for this reporting period

During the reporting period, the average ALE was < 72 m (σ < 90 m). Throughout the period, the ALE evolution showed an increasing trend, with some peaks occurring during the second half. Largest ALE values occurred on 10/12 and were 82 – 91 m (SWIR – BLUE).

The average compliance was 99.21% (98.76% - 99.64%, BLUE – SWIR), with minimum values being 97.55% - 99.39% (BLUE – SWIR).

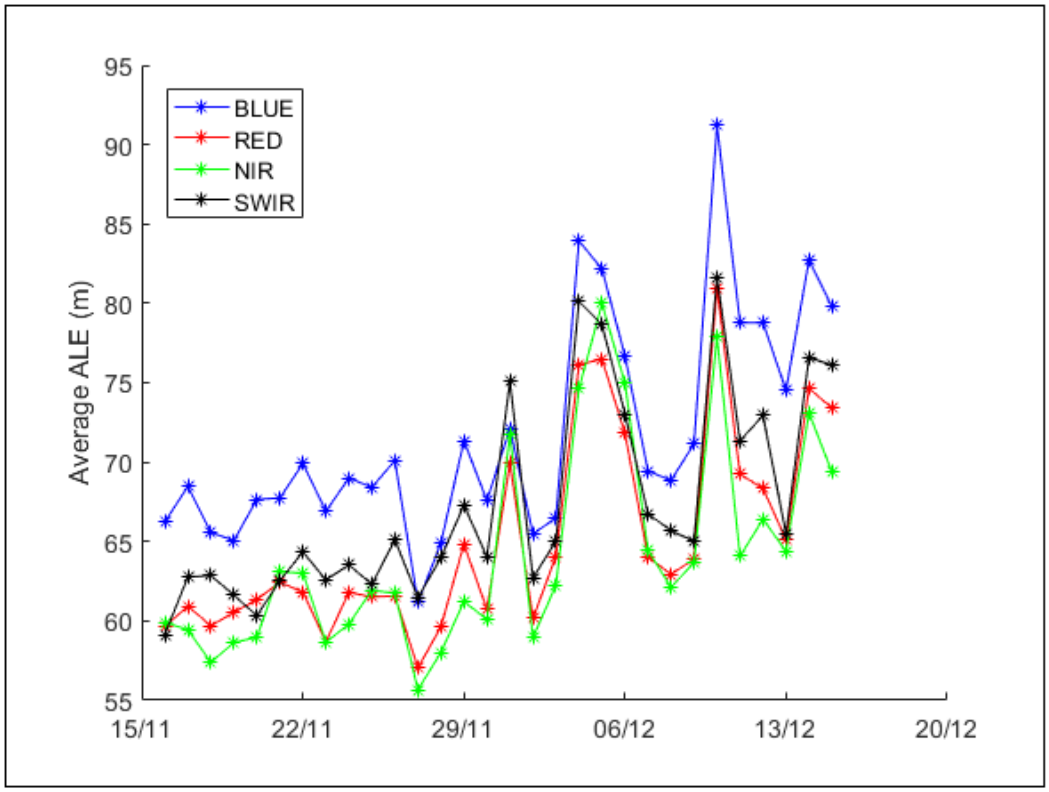

Figure 5: *Daily ALE evolution for 16/11 – 15/12/2020.*

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)	1	01/12
Negligible Gaps (< 1000 km²)	28	25/11, 20/11, 30/11, 05/12, 10/12, 15/12, 06/12, 26/11, 21/11, 11/12, 08/12, 13/12, 28/11, 03/12, 18/11, 23/11, 24/11, 19/11, 29/11, 09/12, 14/12, 04/12, 17/11, 22/11, 12/12, 02/12, 27/11, 07/12
Complete synthesis (no gaps)	1	16/11

Table14: Overview of S1 for this reporting period

Synthesis	Missing	Decom. Error	Geom. Error	Missing TFF	Autom. Recovery	VC4 Missing	Create Contours	Other
20201116	62.14%		1					
20201117	61.94%							
20201118	62.71%	5						
20201119	61.92%	1	1					
20201120	62.36%	2	4					
20201121	60.69%	2	3					
20201122	61.07%	2	3					
20201123	61.06%	2	1					
20201124	60.01%	4	1					
20201125	61.01%		6					
20201126	60.63%	5	3					
20201127	61.51%	3	3					
20201128	60.93%	2	4					
20201129	61.48%	1	10					
20201130	62.17%	5	3					
20201201	64.14%	3	10					1
20201202	60.33%	2	5					
20201203	59.13%	2	6					
20201204	61.33%	6	8					
20201205	61.36%		12					
20201206	61.26%	1	10					
20201207	60.55%	3	4					
20201208	60.14%	1	6					
20201209	60.43%	4	5					
20201210	60.64%	1	5					
20201211	60.81%	4	7					
20201212	59.73%	3	6					
20201213	60.72%		12					
20201214	60.11%		4					
20201215	61.11%	1	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:
  New servers are being configured in preparation of the C2 reprocessing activity. An expansion of the storage capacity is to be installed early January 2021.

- Development:
  Preparation for the Collection 2 are ongoing, with focus on the new atmospheric correction integration and update to the Cloud Optimized GeoTIFF format.

- No other activities scheduled.

7. Operational remarks

No operational remarks