MONTHLY OPERATIONS REPORT

MOR#069

Reporting period from 16-Aug-2019 to 15-Sep-2019

Reference: ***PROBA-V_D5_MOR-069_09_v1.0***
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DOCUMENT CONTROL

Signatures

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Release	Date	Pages	Description	Editor(s)/Reviewer(s)
1.0	**20/09/2019**	All	Initial version	

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1. Summary

In this reporting period, the majority of the synthesis products were nearly complete. Two missing transfer frame files and three automatic recoveries were recorded with impact on product completeness.

On 22th of August, a Multi-Viewing Angle experiment (MVA) was executed over the Barrax (ESP) area. PROBA-V imaged this area in a -55° and a +55° angle with all spectral bands (VNIR + SWIR).

On 26th and 28th, PROBA-V executed a yaw maneuver respectively over the Mauretania2 and Sudan1 calibration regions. This data will be further used for investigation on BRDF effects. After the first yaw maneuver, the amount of decompression errors suddenly dropped significantly. Both the MVA as the yaw maneuvers had an impact on the nominal availability of data over the respective areas.

No specific anomalies were recorded in the radiometric and geometric quality assessment, but daily ALE will be closely monitored as a sharp increase was recorded during the end of this reporting period.

10 new users registered and the total user community of PROBA-V is nearing 1700 users.

Tests were executed on a new cloud masking algorithm in development environment in preparation for 'Collection 2' of the data. Furthermore, most of the MEP user VMs were migrated to the newly supported OpenStack cluster.

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	247
TFF	310	308	2(*)	308

Table 2: Ingested and archived products for this reporting period

(*) TFF 21769 and TFF 21779 were missing due to problems with antennas

3.2. Generated and archived products

Product Type	Total	Processed	Error	Archived
PROBAV_L1A - Calibration	225	222	3**	223
PROBAV_L1A - Nominal	2622	2615	7*	2620
PROBAV_L1C	2615	2615	0	2615
PROBAV_L2A_100M	914	914	0	913
PROBAV_L2A_300M	2615	2615	0	2615
PROBAV_L2A_1KM	2615	2615	0	2615
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

(*) 7 L1A errors due to Create Contours Failed
(**) 3 L1A – Calibration errors

3.3. Backup and archiving service

Product type	Total Files	Total File Size (GB)
TFF	301	797.51
L1A	2766	1428.27
Database transaction logs	768	67.88
Database incremental back-up	34	5.88
Database full back-up	16	773.73

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

Product type	Total Files	Total File Size (GB)
PROBAV_TRANSFERFRAMES	247	709.42
PROBAV_L1A	2280	1269.14
PROBAV_L1C	2093	2463.73
PROBAV_L2A_100M	1481	1342.90
PROBAV_L2A_300M	4188	698.67
PROBAV_L2A_1KM	4189	92.21
PROBAV_L3_S1_TOA_100M	50	1416.23
PROBAV_L3_S1_TOC_100M	50	1476.28
PROBAV_L3_S1_TOC_NDVI_100M	50	172.30
PROBAV_L3_S5_TOA_100M	10	1014.66
PROBAV_L3_S5_TOC_100M	10	1059.33
PROBAV_L3_S5_TOC_NDVI_100M	10	122.46
PROBAV_L3_S1_TOA_300M	50	613.94
PROBAV_L3_S1_TOC_300M	50	638.55
PROBAV_L3_S10_TOC_300M	4	80.97
PROBAV_L3_S10_TOC_NDVI_300M	4	7.30
PROBAV_L3_S1_TOA_1KM	50	82.53
PROBAV_L3_S1_TOC_1KM	49	83.46
PROBAV_L3_S10_TOC_1KM	4	11.04
PROBAV_L3_S10_TOC_NDVI_1KM	4	0.92
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	200	0.25
METEO_METEOSERVICES	199	1.06
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	2600	6	149
PROBAV_L2A_100M	901	0	1
PROBAV_L2A_300M	2602	0	0
PROBAV_L2A_1KM	2602	1	8
PROBAV_L3_S1_TOA_100M	31	31	52
PROBAV_L3_S1_TOC_100M	31	1181	1118
PROBAV_L3_S1_TOC_NDVI_100M	31	216	168
PROBAV_L3_S5_TOA_100M	6	0	2
PROBAV_L3_S5_TOC_100M	6	241	243
PROBAV_L3_S5_TOC_NDVI_100M	6	364	421
PROBAV_L3_S1_TOA_300M	31	66	70
PROBAV_L3_S1_TOC_300M	31	135	215
PROBAV_L3_S10_TOC_300M	3	21	25
PROBAV_L3_S10_TOC_NDVI_300M	3	5	15
PROBAV_L3_S1_TOA_1KM	31	62	63
PROBAV_L3_S1_TOC_1KM	31	427	457
PROBAV_L3_S10_TOC_1KM	3	12	16
PROBAV_L3_S10_TOC_NDVI_1KM	3	1049	1055

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 **1695** with **120** different nationalities representing **1237** different companies/universities.

Product type	Africa	Asia	Europe	N-America	Oceania	S-America
PROBAV_L1C	0	176.43	16.25	0	0	0
PROBAV_L2A_100M	0	0	0	0	0	1.31
PROBAV_L2A_300M	0	0	0	0	0	0
PROBAV_L2A_1KM	0	0.17	0.06	0	0	0
PROBAV_L3_S1_TOA_100M	0	2.69	2.80	0	0	0.20
PROBAV_L3_S1_TOC_100M	0.02	104.28	1466.78	578.24	0	0.27
PROBAV_L3_S1_TOC_NDVI_100M	0	0.89	0.33	0	0	0.02
PROBAV_L3_S5_TOA_100M	0	0	0	0	0	0.12
PROBAV_L3_S5_TOC_100M	17.48	1439.45	1.25	0	0	0

PROBAV_L3_S5_TOC_NDVI_100M	0.30	5.72	24.46	0.24	0	0.62
PROBAV_L3_S1_TOA_300M	0	0	656.73	0.12	0	0.01
PROBAV_L3_S1_TOC_300M	0	0	1024.02	244.98	0	0
PROBAV_L3_S10_TOC_300M	1.91	0	123.31	0	0	0.16
PROBAV_L3_S10_TOC_NDVI_300M	0.01	0.43	0.78	0	0	0.06
PROBAV_L3_S1_TOA_1KM	0	0	96.78	0.00	0	0
PROBAV_L3_S1_TOC_1KM	0	0	134.54	0	0	56.36
PROBAV_L3_S10_TOC_1KM	0.59	0	17.36	0.89	0	0
PROBAV_L3_S10_TOC_NDVI_1KM	1.29	1.33	0.61	0	0	0.01

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

Product Type	Global
L1C	192.68
PROBAV_L2A_100M	1.31
PROBAV_L2A_300M	0
PROBAV_L2A_1KM	0.24
PROBAV_L3_S1_TOA_100M	5.70
PROBAV_L3_S1_TOC_100M	2149.58
PROBAV_L3_S1_TOC_NDVI_100M	1.23
PROBAV_L3_S5_TOA_100M	0.12
PROBAV_L3_S5_TOC_100M	1458.18
PROBAV_L3_S5_TOC_NDVI_100M	31.34
PROBAV_L3_S1_TOA_300M	656.86
PROBAV_L3_S1_TOC_300M	1269.00
PROBAV_L3_S10_TOC_300M	125.37
PROBAV_L3_S10_TOC_NDVI_300M	1.28
PROBAV_L3_S1_TOA_1KM	96.78
PROBAV_L3_S1_TOC_1KM	190.90
PROBAV_L3_S10_TOC_1KM	18.83
PROBAV_L3_S10_TOC_NDVI_1KM	3.23

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

Company	# Downloads
NSMC	979
CHINESE UNIVERSITY OF HONG KONG	408
VITO	393
FEDERAL COLLEGE OF FORESTRY	390
IISC	367
INPE	365
NATIONAL UNIVERSITY OF SCIENCES AND TECHNOLOGY	210
ESA	161
PLANETA	143
UNIVERSIDAD DE SONORA	100

Table 9: Top 10 user companies for the reporting period

Country	# Users
CHINA	169
BELGIUM	150
INDIA	82
FRANCE	80
BRAZIL	78
UNITED STATES	74
ITALY	70
UNITED KINGDOM	59
NETHERLANDS	56
GERMANY	52

Table 10: Top 10 countries with most registered users

List of issues raised by users:

Quota
FW: Time Series Viewer
Re: Proba-V MEP / Terrascope: Hadoop cluster downtime (complete)
RE: Proba-V MEP / Terrascope: Hadoop cluster downtime (complete)
user umask
RE: [VITO RS] Re: hspf_acc
Re: ProbaV MEP: Scihub queries
FW: [PROBLEM] disks on jleon is WARNING!
docker.errors.ImageNotFound
PDF: (API) - 2019/9/2 - PROBA-V Mission Exploitation Platform - Time series
I installed two editors and none worked
virtual machine register problem
hspf_acc
Re: Proba-V MEP: migration of user VM's to Terrascope
PDF: N.A. - 2019/8/29
RE: Proba-V MEP: migration of user VM's to Terrascope
Re: Proba-V MEP: migration of user VM's to Terrascope
file manager gets frozen
spark context setting up problem
gdal and catalogclient.catalog not working on MEP
Re: Proba-V MEP: migration of user VM's to Terrascope
jenkins restart
request for installation of additional library on epods
Docker image not available on epods
Missing python module: SentinelAPI
Re: Proba-V MEP: migration of user VM's to Terrascope
Sugarcane monitoring in Brazil
Userdata drive size

4. Image Calibration services

4.1. Radiometric Calibration

Calibration request type	Total	Processed	Not received	Error
CLOUDS	20	14	6	0
DARK CURRENT	25	16	9	0
MOON	2	2	0	0
RAYLEIGH	63	43	20	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	220	186	26
PROBA-V_L1B_INTERSECTION	795	397	398
PROBA-V_L1B_OVERLAPREGION	0	0	0

Table 12: Processed calibration images for this reporting period

(*) Due to insufficient overlap with the calibration region of interest, not enough pixels (e.g. clouds contamination), site not sufficiently uniform (illumination), etc.

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 the Libya-4 calibration results for RED and NIR band of the RIGHT camera keep on showing a clear positive trend and/or bias over last 6 months. The cause of this trend has not yet been found. Currently the increasing trend is not yet corrected for in the ICP files. Investigations are still ongoing.

No new bad pixel were identified.

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.

The current ICP files are:

- PROBAV_ICP_RADIOMETRIC#LEFT_20190901_V01
- PROBAV_ICP_RADIOMETRIC#CENTER_20190901_V01
- PROBAV_ICP_RADIOMETRIC#RIGHT_20190901_V01

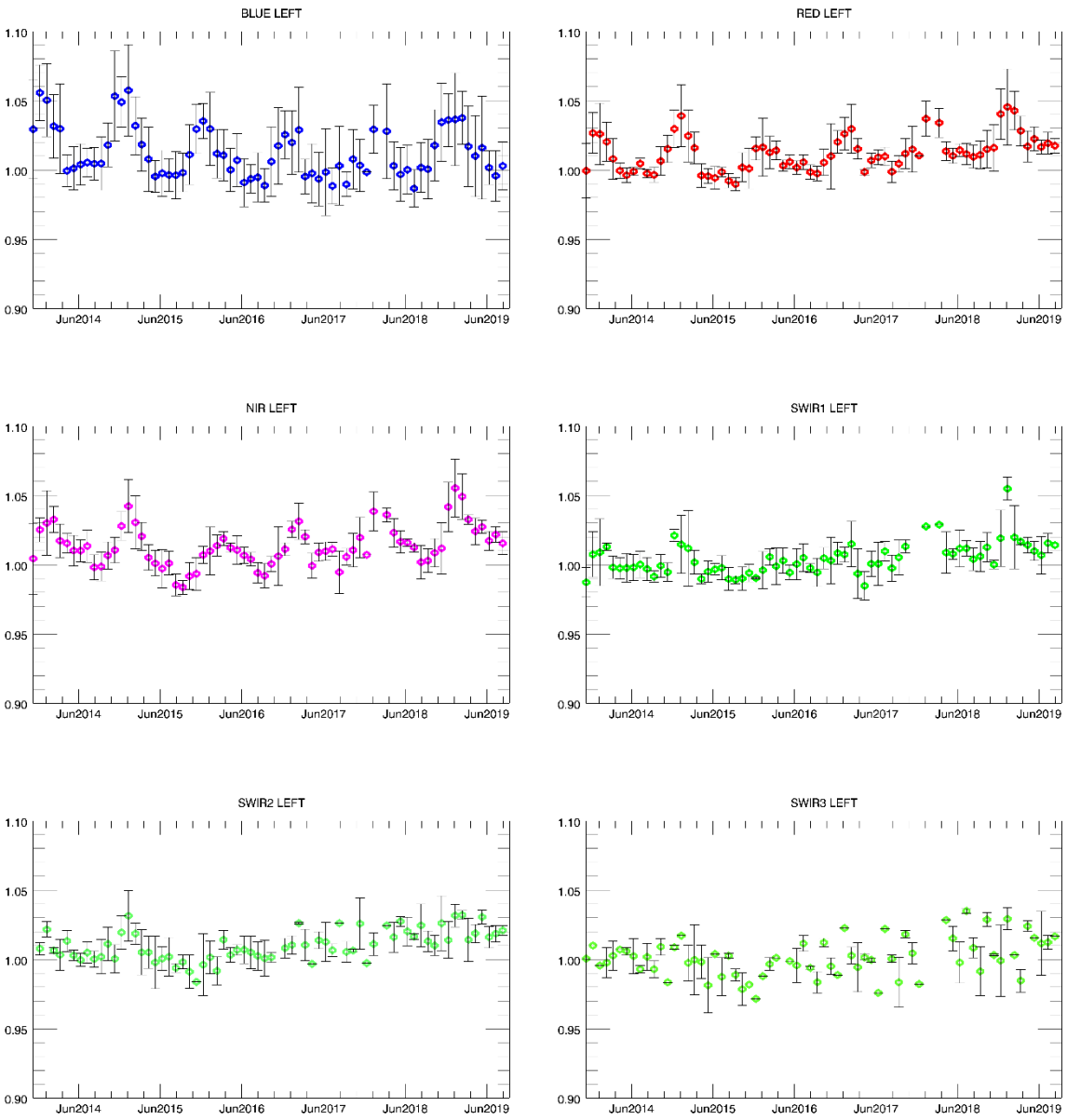

Figure 1. Libya-4 desert calibration results: LEFT monthly averaged results (collection 1)

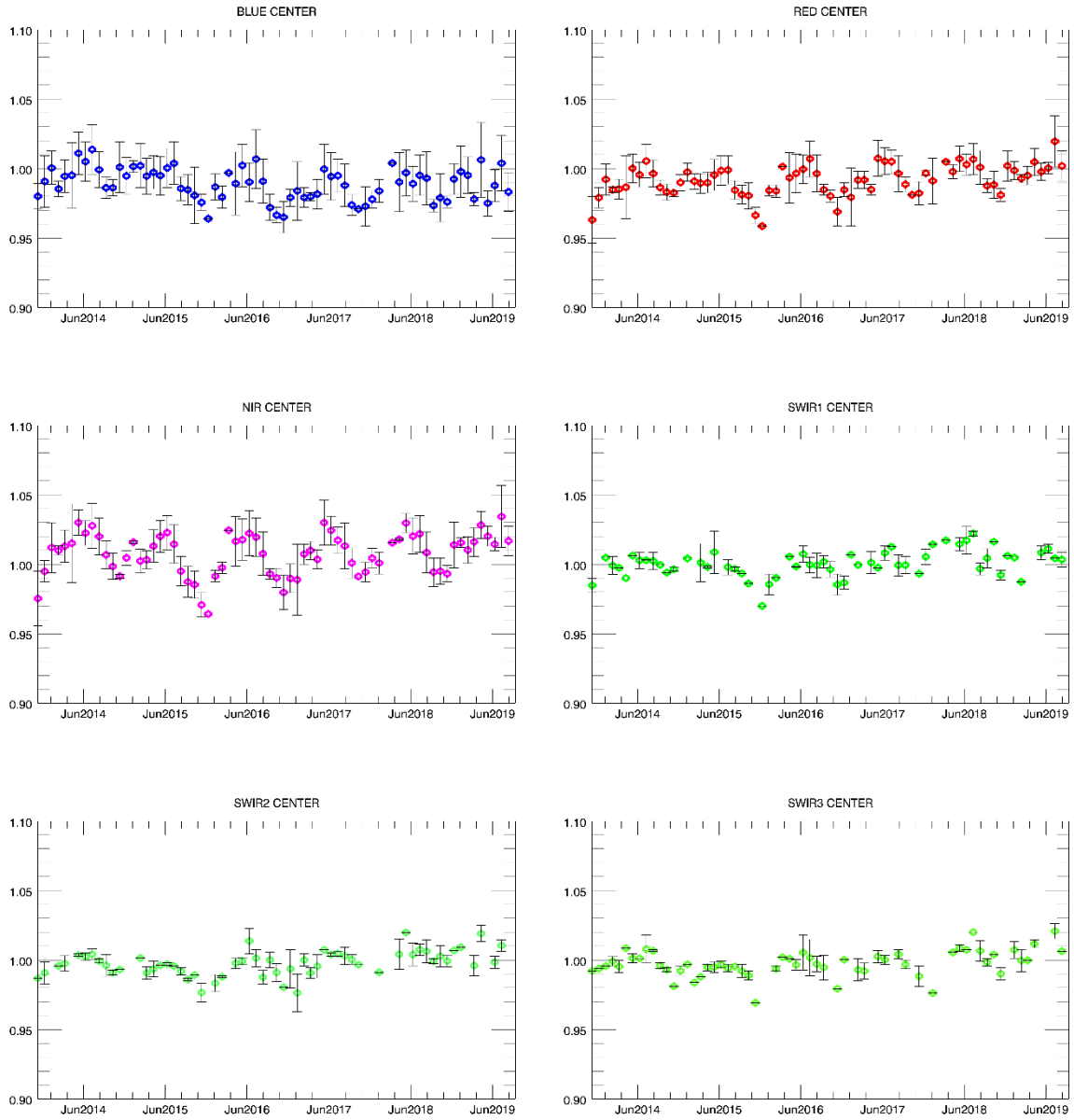

Figure 2. Libya-4 desert calibration results: CENTER monthly averaged results (collection 1)

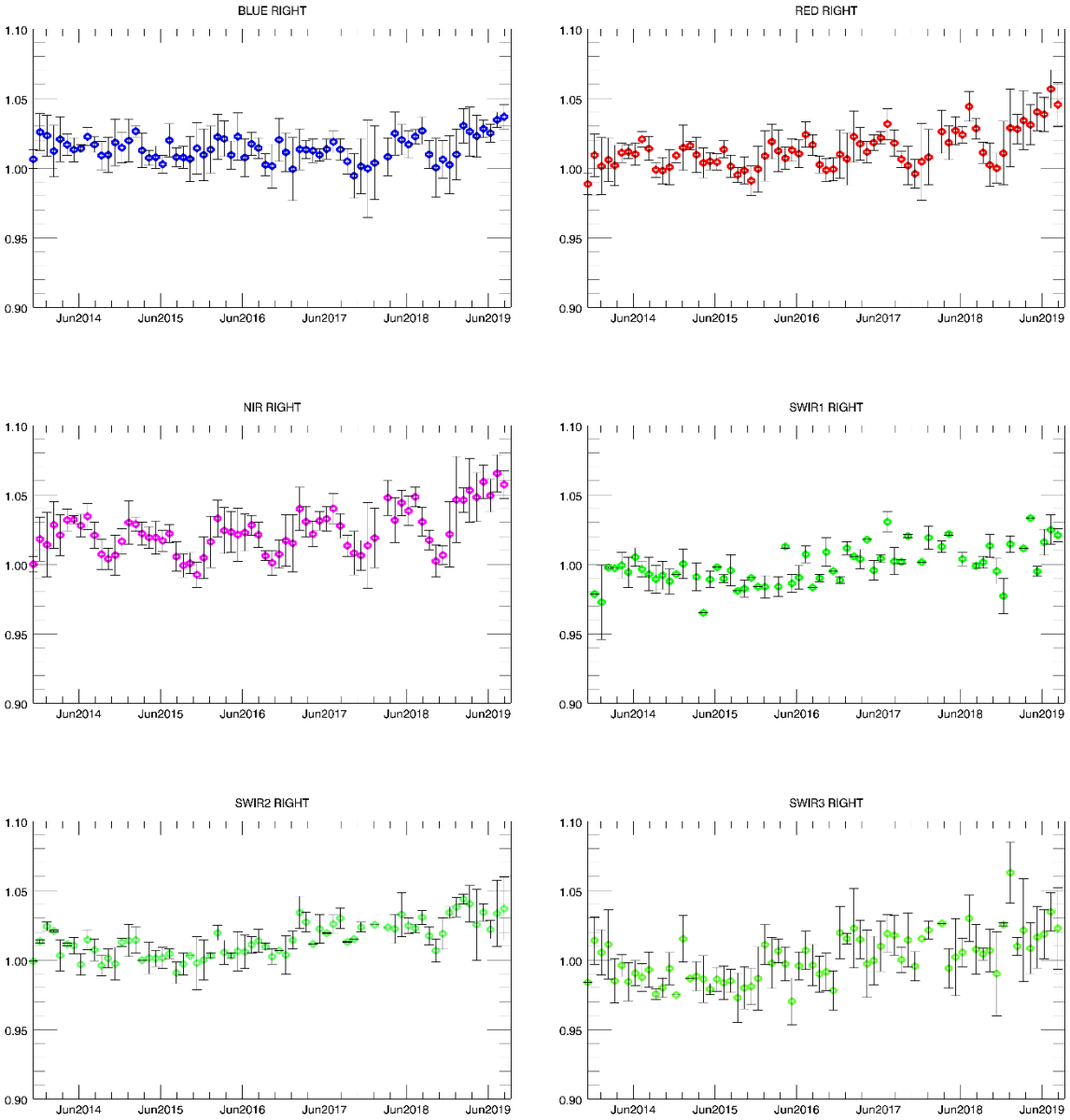

Figure 3. Libya-4 desert calibration results: RIGHT monthly averaged results (collection 1)

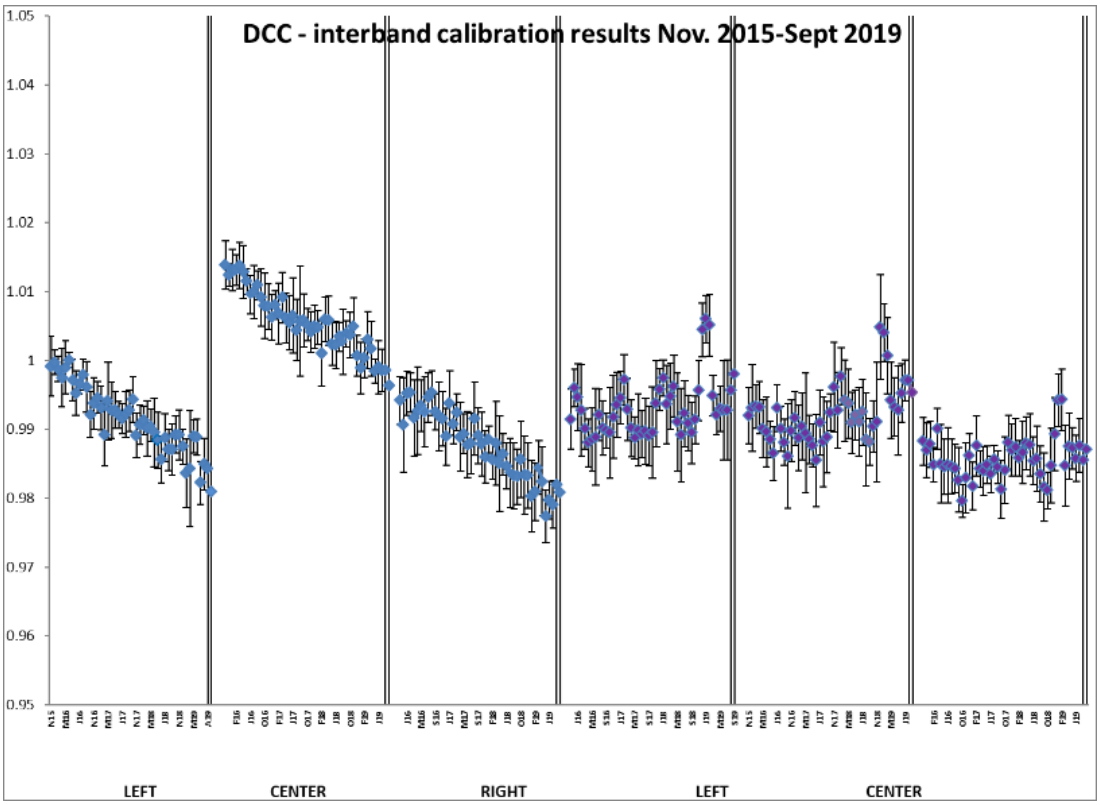

Figure 4. DCC inter-band calibration results: LEFT, CENTER and RIGHT camera (collection 1)

4.2. Geometric Calibration

Calibration image type	Total	Processed	Error
PROBA-V_L1C_INTERSECTION	14120	14120	0

Table 13: Processed calibration images for this reporting period

During previous month, the average ALE was < 78 m (σ < 92 m). During most of the period, ALE values were well within 90 m, with a slight decreasing trend.
However, from 11/9 onwards the ALE sharply increased towards 114 – 131 m (SWIR – BLUE) on 15/9. We will closely monitor whether these high values remain and will timely perform corrective actions when necessary.

The average compliance was 99.22% (98.78% - 99.75% for BLUE – SWIR). No anomalous behavior occurred until the sharp ALE increase from 11/9 onwards.
The minimum ALE values occurred on 14/9 and 15/9 and spanned a range from 96.60% - 99.64% for BLUE – SWIR.

Geometric ICP file

- PROBAV_ICP_GEOMETRIC#LEFT_20160907_V01
- PROBAV_ICP_GEOMETRIC#CENTER_20160907_V01
- PROBAV_ICP_GEOMETRIC#RIGHT_20160907_V01

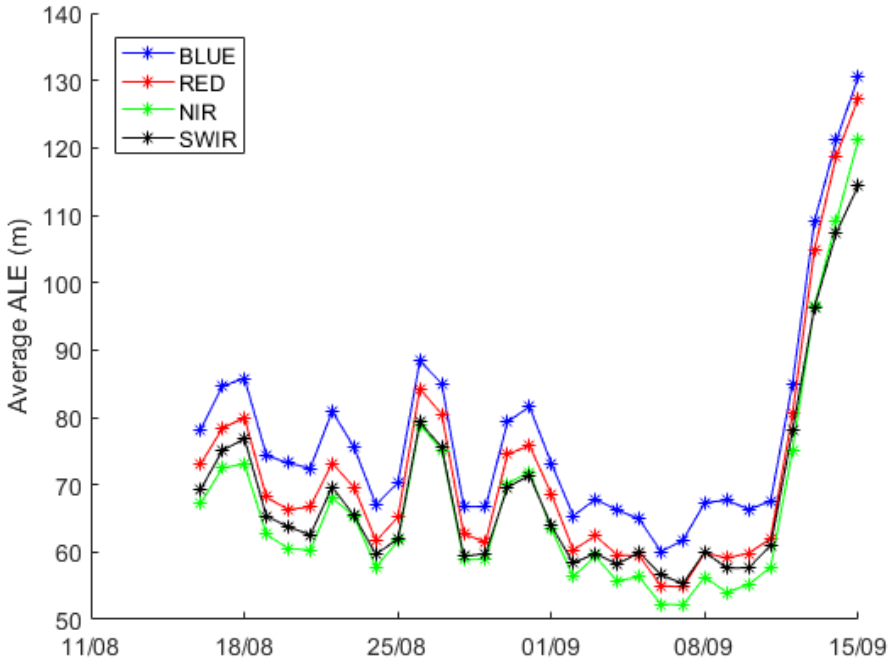

Figure 5: Daily ALE evolution for all bands from 16/8 – 15/9/2019.

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

Key	Summary	Status	Created	Component/s
PROBAVUS-7	Very small images fail to process	Resolved	10/01/2014	General
PROBAVUS-63	Cloud shadow detection at high solar zenith angles not working properly	Open	11/05/2016	Software
PROBAVUS-65	Processing statuses L2 products	In Progress	16/09/2016	Software
PROBAVUS-66	Cloud cover percentages on PDF products are not reliable	Resolved	19/10/2016	Software
PROBAVUS-68	ICP file version not taken into account when processing	In Progress	20/03/2017	Software
PROBAVUS-69	Version number of segment not filtered when querying for syntheses	Open	20/03/2017	Software
PROBAVUS-70	Investigate L2A artefact in data	Open	31/05/2017	Software
PROBAVUS-72	Status mask of data with decompression error is not correctly set	Open	22/06/2017	Software
PROBAVUS-75	Clear pixel edge in cloud shadow detection	Open	15/11/2017	Software

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
1 issue is resolved but remain in the list logging purposes
5 issues are open and remain to be solved (at following reprocessing action)

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))	3	26/08, 28/08, 27/08
Large Gaps (< 21600 km²)	0	22/08
Medium Gaps (< 10000 km²)	1	05/09
Minor Gaps (< 3600 km²)	5	13/09, 08/09, 15/09, 07/09, 11/09
Negligible Gaps (< 1000 km²)	22	31/08, 21/08, 16/08, 10/09, 04/09, 20/08, 30/08, 25/08, 09/09, 14/09, 03/09, 24/08, 29/08, 19/08, 18/08, 12/09, 23/08, 02/09, 01/09, 06/09, 17/08
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
20190816	0.24%	13	8					
20190817	0.33%	18	4					
20190818	0.11%	11	9					
20190819	0.13%	12	11					
20190820	0.34%	15	9					
20190821	0.42%	12	7					
20190822	6.12%	13	19				3	1
20190823	0.18%	12	8					
20190824	0.88%	13	6					
20190825	0.25%	13	1					
20190826	15.27%	2	7	1			3	2
20190827	4.95%	4		1				
20190828	8.43%	5	3					1
20190829	0.42%	1	1					
20190830	0.73%	2	5					
20190831	0.23%	5	6					
20190901	0.02%		9					
20190902	1.01%	3	9					
20190903	4.09%	1	13					
20190904	0.42%		16					
20190905	1.45%	8	11		1	1	1	
20190906	0.04%	1	4					
20190907	1.16%	4	6					
20190908	1.10%	2	5		1			
20190909	0.24%	3	4					
20190910	0.03%	3	3					
20190911	2.80%	5	3			1		
20190912	0.19%	2						
20190913	1.21%							1
20190914	0.14%	4	3					
20190915	2.39%	4	5		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

- No other activities scheduled.

7. Operational remarks

No operational remarks