



# MONTHLY OPERATIONS REPORT

**MOR#058**

**Reporting period from 16-Sep-2018 to 15-Oct-2018**

**Reference: *PROBA-V\_D5\_MOR-058\_0\_v1.0***

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## DOCUMENT CONTROL

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## 1. Summary

In this reporting period, the majority of the synthesis products were nearly complete. Most missing data in the synthesis products were caused by automatic recoveries of the platform or one missing TFF file. In the period of 24/09 to 1/10, the downlink rate of the USAK01 antenna was lower than expected, leading to loss of data over the North American continent. Decompression and geometric errors had only a minor impact on the data in the past month.

Geometric assessment of the products pointed out that products of 19-20-21 of September had a large geometric location error of + 500 m. These products are now disabled in the catalog and are investigated further. Once the core issue has been found, products will be reprocessed and made available again in the catalog. There were no other anomalies in geometric

In terms of radiometric quality, a degradation model is no longer applied to the SWIR absolute calibration coefficients since October 2018 as the current linear model resulted in an overcorrection of the degradation in the SWIR. Investigation for the implementation of a non-linear degradation model to take into account the asymptotic degradation trend is on-going.

The total user community of PROBA-V surpassed 1500 users since this reporting period. Nearly 6.5 TB has been delivered in the past month.

No new developments are expected in the coming period.

## 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	240
TFF	300	299	1 <sup>(*)</sup>	299

Table 2: Ingested and archived products for this reporting period

(\*) One TFF Missing: Data from this pass was lost due to scheduling/configuration issue.

### 3.2. Generated and archived products

Product Type	Total	Processed	Error	Archived
PROBAV_L1A - Calibration	204	204	0	204
PROBAV_L1A - Nominal	2552	2547	5	2552
PROBAV_L1C	2547	2547	0	2547
PROBAV_L2A_100M	887	887	0	884
PROBAV_L2A_300M	2547	2547	0	2546
PROBAV_L2A_1KM	2547	2547	0	2544
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

5 x L1A error due to geometric processing



### 3.3. Backup and archiving service

Product type	Total Files	Total File Size (GB)
TFF	291	667.33
L1A	2651	1375.01
Database transaction logs	768	65.54
Database incremental back-up	40	9.15
Database full back-up	7	269.85

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

Product type	Total Files	Total File Size (GB)
PROBAV_TRANSFERFRAMES	308	755.84
PROBAV_L1A	2735	1519.11
PROBAV_L1C	2541	2999.86
PROBAV_L2A_100M	1602	1448.57
PROBAV_L2A_300M	4535	745.24
PROBAV_L2A_1KM	4533	99.11
PROBAV_L3_S1_TOA_100M	52	1457.40
PROBAV_L3_S1_TOC_100M	51	1476.27
PROBAV_L3_S1_TOC_NDVI_100M	52	174.95
PROBAV_L3_S5_TOA_100M	8	787.49
PROBAV_L3_S5_TOC_100M	9	934.68
PROBAV_L3_S5_TOC_NDVI_100M	9	105.61
PROBAV_L3_S1_TOA_300M	53	653.51
PROBAV_L3_S1_TOC_300M	51	651.48
PROBAV_L3_S10_TOC_300M	5	106.96
PROBAV_L3_S10_TOC_NDVI_300M	4	7.34
PROBAV_L3_S1_TOA_1KM	52	86.82
PROBAV_L3_S1_TOC_1KM	52	89.28
PROBAV_L3_S10_TOC_1KM	4	12.16
PROBAV_L3_S10_TOC_NDVI_1KM	4	0.95
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	255	0.32
METEO_METEOSERVICES	240	1.28
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	2540	104	338
PROBAV_L2A_100M	801	7	10
PROBAV_L2A_300M	2289	32	87
PROBAV_L2A_1KM	2289	0	52
PROBAV_L3_S1_TOA_100M	27	91	53
PROBAV_L3_S1_TOC_100M	27	262	300
PROBAV_L3_S1_TOC_NDVI_100M	30	238	153
PROBAV_L3_S5_TOA_100M	6	14	17
PROBAV_L3_S5_TOC_100M	6	300	299
PROBAV_L3_S5_TOC_NDVI_100M	6	485	616
PROBAV_L3_S1_TOA_300M	27	120	121
PROBAV_L3_S1_TOC_300M	27	133	177
PROBAV_L3_S10_TOC_300M	3	56	52
PROBAV_L3_S10_TOC_NDVI_300M	3	182	277
PROBAV_L3_S1_TOA_1KM	27	93	103
PROBAV_L3_S1_TOC_1KM	27	120	156
PROBAV_L3_S10_TOC_1KM	3	14	20
PROBAV_L3_S10_TOC_NDVI_1KM	3	822	829

Table 6: Ordered and delivered products for this reporting period

### 3.5. End-user activity

18 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 **1506** with **117** different nationalities representing **1130** different companies/universities.

Product type	Africa	Asia	Europe	N-America	Oceania	S-America
PROBAV_L1C	0	544.00	9.87	0	0	0
PROBAV_L2A_100M	0	0	1.61	0	0	0
PROBAV_L2A_300M	0	0.02	9.09	0.04	0	0
PROBAV_L2A_1KM	0	0.00	1.28	0	0	0.01
PROBAV_L3_S1_TOA_100M	0	0.49	2.88	0.02	0.10	0
PROBAV_L3_S1_TOC_100M	0	199.68	763.23	705.70	0	0
PROBAV_L3_S1_TOC_NDVI_100M	0.00	0	0.00	0.03	0	0
PROBAV_L3_S5_TOA_100M	0	0.01	528.24	0	0	2.02
PROBAV_L3_S5_TOC_100M	23.11	154.77	551.37	0.38	0	0

PROBAV_L3_S5_TOC_NDVI_100M	0.00	0.08	11.46	0.06	0	0.53
PROBAV_L3_S1_TOA_300M	0	2.71	973.32	0	0	0
PROBAV_L3_S1_TOC_300M	4.53	0.23	1010.38	306.38	0	0
PROBAV_L3_S10_TOC_300M	4.53	2.48	182.89	0	0	0
PROBAV_L3_S10_TOC_NDVI_300M	4.64	0.60	0.74	0	0	0.06
PROBAV_L3_S1_TOA_1KM	0	0.01	142.67	0	0	0.01
PROBAV_L3_S1_TOC_1KM	0	0.01	236.56	0	0	0
PROBAV_L3_S10_TOC_1KM	0.63	0.01	18.05	9.72	0	0
PROBAV_L3_S10_TOC_NDVI_1KM	0.40	30.33	1.49	0.31	0	0.01

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

Product Type	Global
L1C	553.88
PROBAV_L2A_100M	1.61
PROBAV_L2A_300M	9.15
PROBAV_L2A_1KM	1.29
PROBAV_L3_S1_TOA_100M	3.50
PROBAV_L3_S1_TOC_100M	1668.60
PROBAV_L3_S1_TOC_NDVI_100M	0.04
PROBAV_L3_S5_TOA_100M	530.27
PROBAV_L3_S5_TOC_100M	729.63
PROBAV_L3_S5_TOC_NDVI_100M	12.13
PROBAV_L3_S1_TOA_300M	976.04
PROBAV_L3_S1_TOC_300M	1321.51
PROBAV_L3_S10_TOC_300M	189.91
PROBAV_L3_S10_TOC_NDVI_300M	6.05
PROBAV_L3_S1_TOA_1KM	142.68
PROBAV_L3_S1_TOC_1KM	236.57
PROBAV_L3_S10_TOC_1KM	28.41
PROBAV_L3_S10_TOC_NDVI_1KM	32.54

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

Company	# Downloads
VITO	366
CNRS	358
UNIVERSITY OF TOKYO	321
CSA	296
HASSELT UNIVERSITY	212



N/A	197
SXAU	190
CESBIO	178
AIRBUS	156
CHENGDU UNIVERSITY OF TECHNOLOGY	143

Table 9: Top 10 user companies for the reporting period

Country	# Users
CHINA	148
BELGIUM	125
FRANCE	70
UNITED STATES	69
BRAZIL	68
INDIA	68
ITALY	67
UNITED KINGDOM	55
NETHERLANDS	52
GERMANY	49

Table 10: Top 10 countries with most registered users

**List of issues raised by users:**

Issue
pyopencil kan niet worden geïnstalleerd
http://epod6.vgt.vito.be:8088/cluster/apps Error 401 authentication required
spot-vegetation CN domain and keyword
Kan geen job meer starten op MEP
Re: [c3s_312b_lot5] PROBA-V LAI/FAPAR samples
/data/users/Public/ en /data/users/Private is niet beschikbaar op mijn nieuwe VM
MEP VM zeer traag
PDF: N.A. - 2018/10/10 - NDVI data download
Git submodules
Proba-V lifetime
Install library
Could not connect to server FileZilla
problem accessing VM on the MEP [SB]
Requesting package
Failed to query index /nifidata/provenance_repository/index-1536857619651
HD-EC RITM0044437 Earth News : PROBA-V's Image of the Week: Hurricane Florence

## 4. Image Calibration services

### 4.1. Radiometric Calibration

Calibration request type	Total	Processed	Not received	Error
CLOUDS	13	12	1	0
DARK CURRENT	17	17	0	0
MOON	0	0	0	0
RAYLEIGH	38	38	0	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	0	0	0
PROBA-V_L1B_CALIBRATION	204	187	12
PROBA-V_L1B_INTERSECTION	804	388	416
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.

Since October 2018 a degradation model is no longer applied to the SWIR absolute calibration coefficients as the current linear model resulted in an overcorrection of the degradation in the SWIR. Investigation for the implementation of a non-linear degradation model to take into account the asymptotic degradation trend is on-going.

The DDC NIR band calibration results for the RIGHT camera show since a few months a decreasing trend. As this trend is not confirmed by the desert calibration results, no specific action has been currently taken.

Due to a forgetfulness in the instrument calibration planning no lunar acquisitions were performed during the reporting period.

Processing of the yaw maneuver data is still ongoing.

No new bad pixels have been identified.

**Radiometric ICP file**

The BLUE LEFT/CENTER absolute calibration coefficients will be updated following a linear degradation model. No updates will be performed for the SWIR strips. Furthermore the dark currents will be updated.

The current ICP files are:

- PROBAV\_ICP\_RADIOMETRIC#LEFT\_20181001\_V01
- PROBAV\_ICP\_RADIOMETRIC#CENTER\_20181001\_V01
- PROBAV\_ICP\_RADIOMETRIC#RIGHT\_20181001\_V01

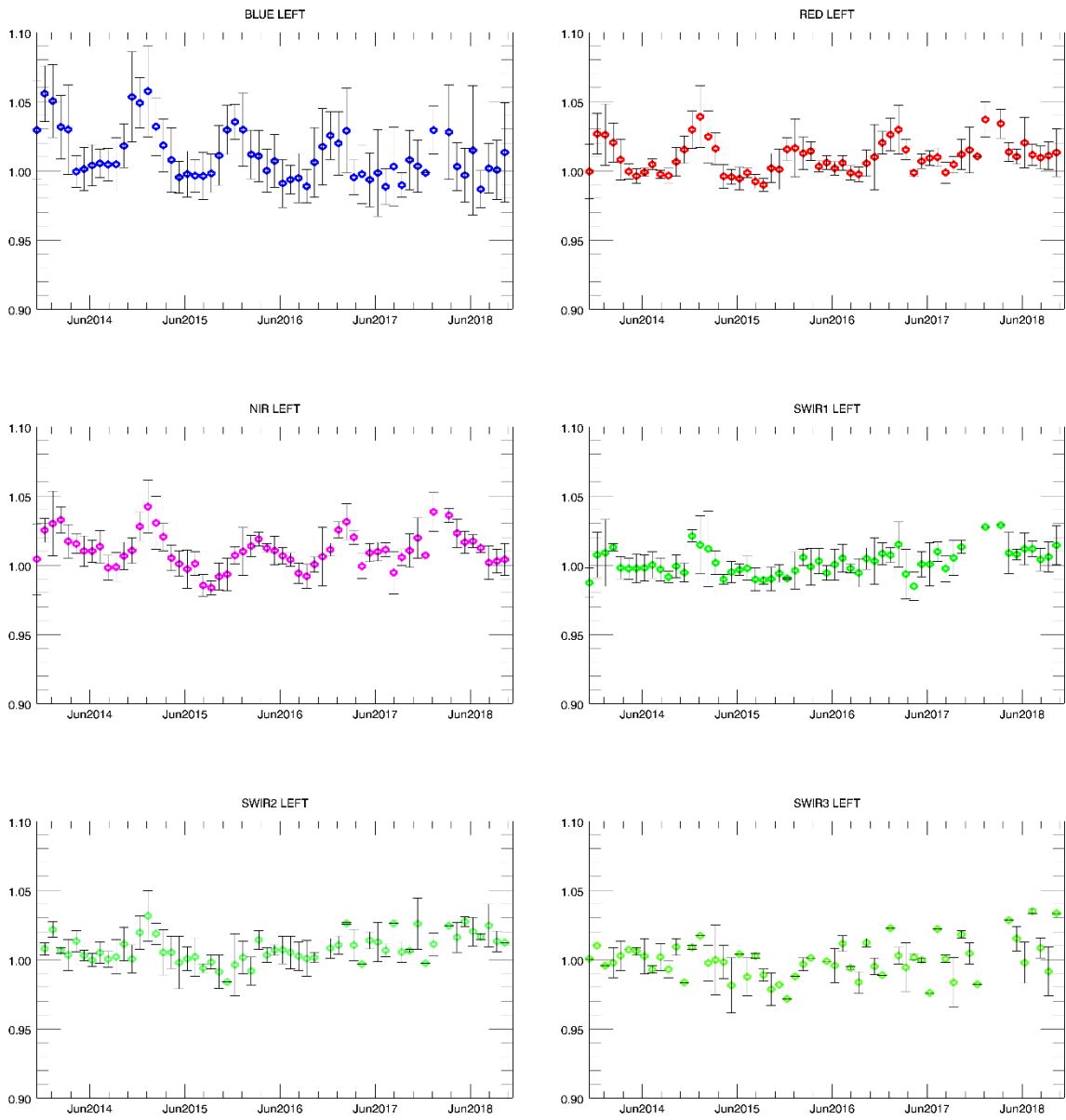


Figure 1. Libya-4 desert calibration results: LEFT monthly averaged results (collection 1)

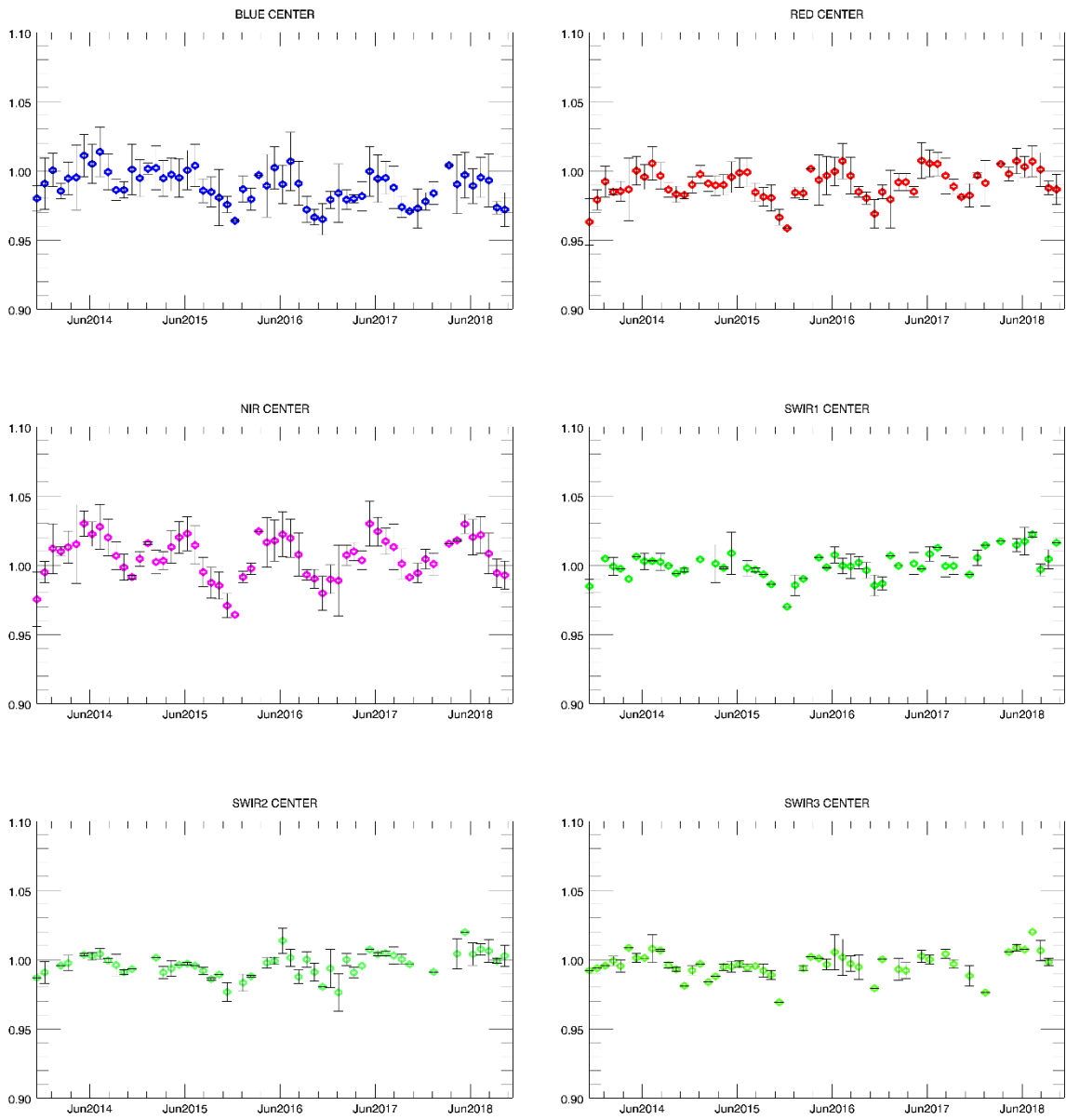


Figure 2. Libya-4 desert calibration results: CENTER monthly averaged results (collection 1)

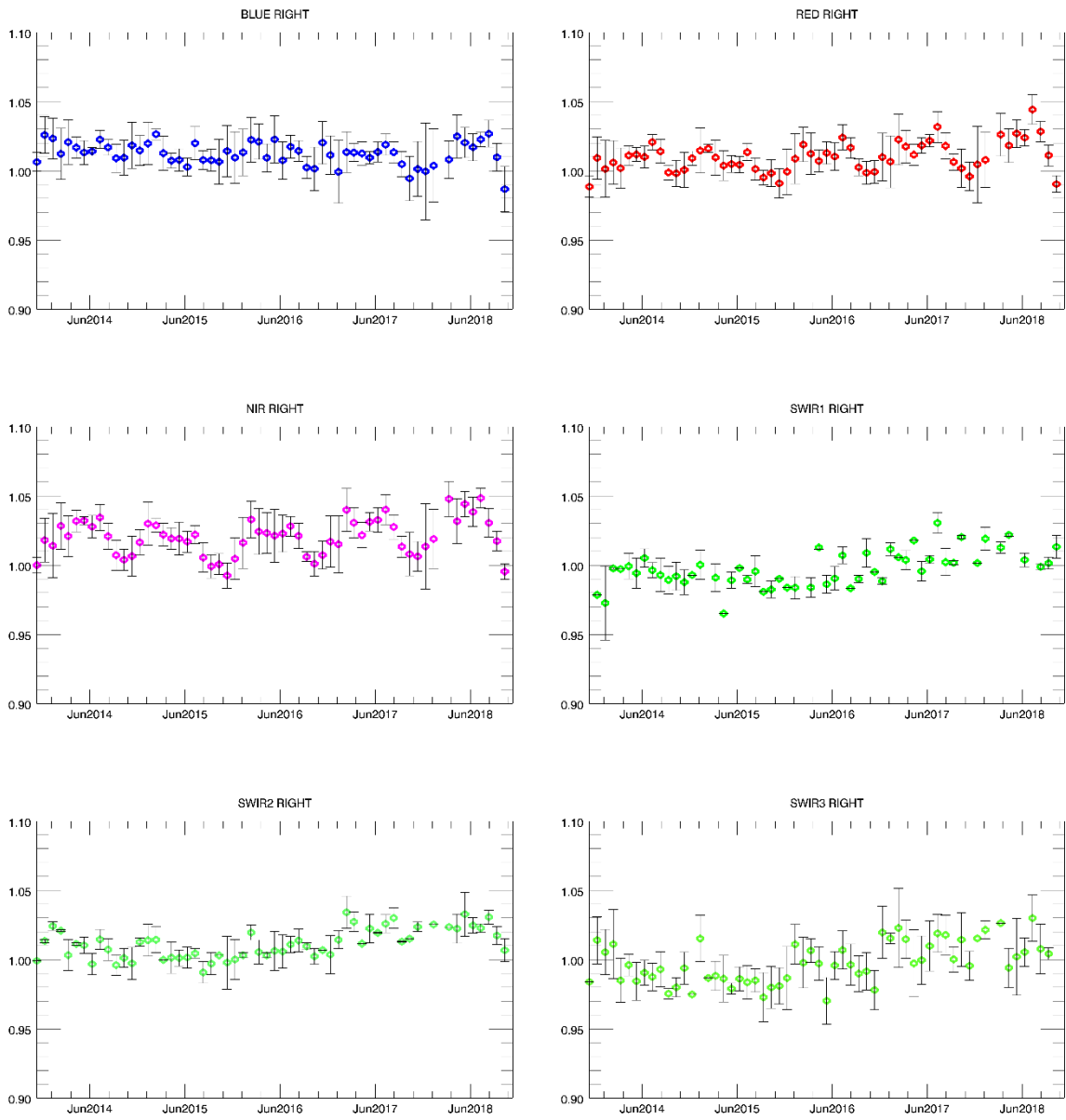


Figure 3. Libya-4 desert calibration results: RIGHT monthly averaged results (collection 1)

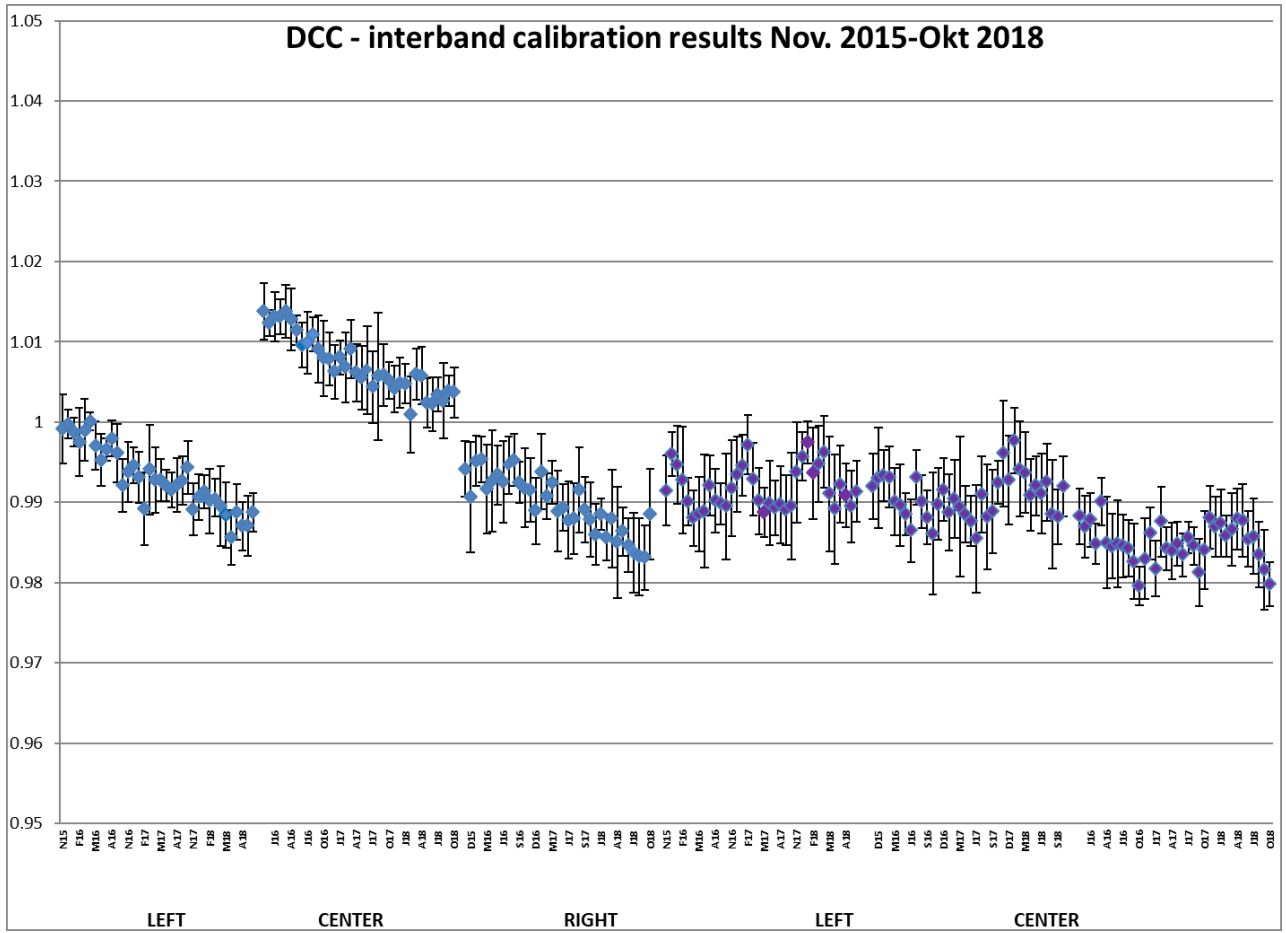


Figure 4. DCC inter-band calibration results: LEFT, CENTER and RIGHT camera (collection 1)

## 4.2. Geometric Calibration

Calibration image type	Total	Processed	Error
PROBA-V_L1C_INTERSECTION	13741	13741	0

Table13: Processed calibration images for this reporting period

During previous month, the average ALE was relatively high with  $< 101$  m ( $\sigma < 110$  m). However, as can be seen from the ALE plot, a short period (19-9 – 21/9) with exceptionally high values occurred. During these days, the ALE values increased to 525 – 520 m. As a consequence, the compliance for these days was very low (~21% for BLUE – NIR on 20/9).

The number of GCPs for these days was slightly lower than for the other days, but the statistics were still obtained over ~35,000 – 50,000 points, which means that the very high ALE values are not caused by a few outliers and are thus of a systematic nature.

Because the examination of individual segments didn't reveal a clear cause, we have raised this issue to Qinetiq for further investigation. We will report on their findings, when available, in the next MOR. During the remainder of the period, ALE behavior was back to normal, with a peak of 100 – 110 m occurring on 30/9, after which the ALE decreased to 65 – 85 m.

If we discard the previously discussed outlier days, the average ALE was 75 m ( $\sigma < 92$  m) and the average compliance was 99.22% (98.80 – 99.73% for BLUE – SWIR).

### Geometric ICP file

- PROBAV\_ICP\_GEOMETRIC#LEFT\_20160907\_V01
- PROBAV\_ICP\_GEOMETRIC#CENTER\_20160907\_V01
- PROBAV\_ICP\_GEOMETRIC#RIGHT\_20160907\_V01

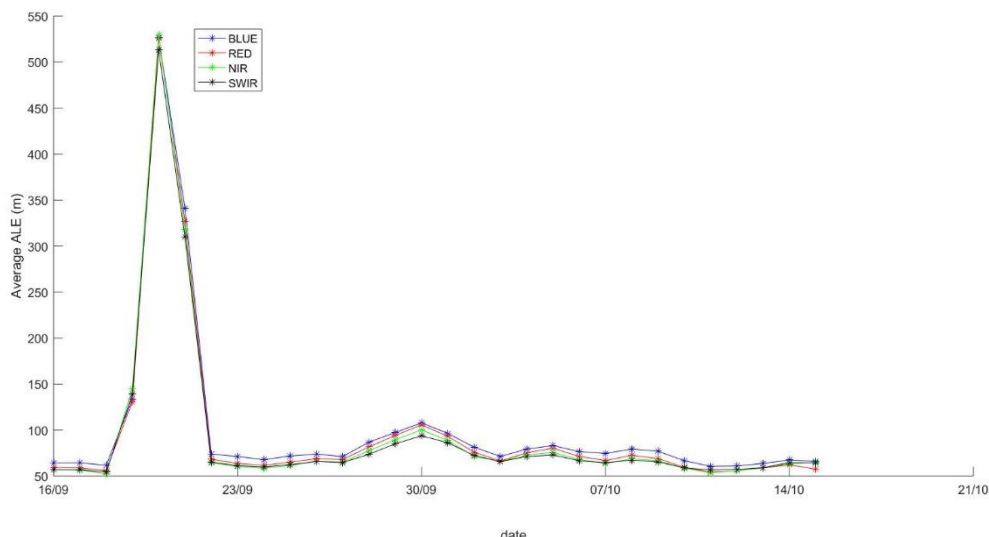


Figure 5 - Daily ALE of period 16/09/2018 to 15/10/2018



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

**0** new issues were logged during this reporting period

**0** issues were resolved and closed during this reporting period

**1** issue is resolved but remain to be closed formally

**1** issues are resolved but remain in the list logging purposes

**7** issues are open and remain to be solved but do not have impact on nominal production

## 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
<b>Major Gaps (&gt; 21600 km<sup>2</sup> (missing TFF))</b>	0	
<b>Large Gaps (&lt; 21600 km<sup>2</sup>)</b>	1	22/09
<b>Medium Gaps (&lt; 10000 km<sup>2</sup>)</b>	3	01/10, 28/09, 30/09
<b>Minor Gaps (&lt; 3600 km<sup>2</sup>)</b>	8	27/09, 24/09, 06/10, 18/09, 26/09, 21/09, 05/10, 10/10
<b>Negligible Gaps (&lt; 1000 km<sup>2</sup>)</b>	18	17/09, 12/10, 07/10, 02/10, 23/09, 03/10, 08/10, 13/10, 15/10, 29/09, 04/10, 19/09, 14/10, 09/10, 11/10, 16/09, 20/09, 25/09
<b>Complete synthesis (no gaps)</b>	0	

Table14: Overview of S1 for this reporting period

Synthesis	Missing	Decom. Error	Geom. Error	Missing TFF	Autom. Recovery	VC4 Missing	Create Contours	Other
20180916	0.40%	3						
20180917	0.27%	3	3					
20180918	0.50%	4	3		1	1		
20180919	0.04%	5	3					
20180920	0.33%	2					11	
20180921	2.02%	5	4		1		1	
20180922	8.20%	5	1	1			1	3
20180923	0.32%	4	1					
20180924	0.78%	1						1
20180925	0.34%	1						
20180926	3.45%	7	8		2			1
20180927	1.21%	6	2			1		1
20180928	4.33%	4	6				1	
20180929	0.99%	3						
20180930	1.20%	4	4			2		
20181001	2.27%	6	5		1			1
20181002	0.00%	1						
20181003	0.21%	2	3					
20181004	0.26%	1						
20181005	1.95%	5	6		1			
20181006	2.16%	4	3		1			
20181007	0.01%		1					
20181008	0.38%	2						
20181009	0.44%	1						
20181010	2.62%	7	3		1			
20181011	0.60%	5						
20181012	0.02%	2	2					
20181013	0.24%	3	4					
20181014	0.01%	2						
20181015	0.04%	2	6					

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