



# MONTHLY OPERATIONS REPORT

**MOR#055**

**Reporting period from 16-Jun-2018 to 15-Jul-2018**

**Reference: *PROBA-V\_D5\_MOR-055\_07\_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 decompression and geometric errors and some automatic recoveries of the platform.

On the night of June 26-27, 5 passes were missed at the Inuvik data reception station due to a human error in the configuration files. On July 9, a yaw manoeuvre was performed over the Niger 1 calibration zone in order to improve radiometric calibration of the right camera. This caused also a gap over the European and African continent for this particular day. On 18/07 and 27/07, new manoeuvres are planned respectively for the center and left camera.

Due to a reconfiguration of the new NAS system, some mounts were unavailable on June 27<sup>th</sup>. This stopped the PROBA-V processing workflow for some hours. The issue was solved with only a minor delay on delivery of the data.

There were no other major issues with the image quality during this reporting period for the radiometric quality. Due to a processing issue, the geometric assessment of the absolute geolocation error could only be processed up to 27/06. The remaining part will be reported in next reporting period.

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

Due to a reconfiguration of the new NAS system, some mounts were unavailable on June 27<sup>th</sup>. This stopped the PROBA-V processing workflow for some hours. The issue was solved with only a minor delay on delivery of the data.

## 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	295	5 <sup>(*)</sup>	295

Table 2: Ingested and archived products for this reporting period

(\*) 5 x Missing TFF's due to lost passes at the Inuvik DRS due to a human mistake on 26-27/07/2018

### 3.2. Generated and archived products

Product Type	Total	Processed	Error <sup>(*)</sup>	Archived
PROBAV_L1A - Calibration	245	244	1	245
PROBAV_L1A - Nominal	2512	2505	7	2512
PROBAV_L1C	2505	2505	0	2505
PROBAV_L2A_100M	882	882	0	882
PROBAV_L2A_300M	2505	2505	0	2505
PROBAV_L2A_1KM	2505	2505	0	2505
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

(\*) 8 x L1A error due to geometric processing



### 3.3. Backup and archiving service

Product type	Total Files	Total File Size (GB)
TFF	290	663.28
L1A	2671	1346.52
Database transaction logs	768	67.95
Database incremental back-up	34	338.74
Database full back-up	10	260.74

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

Product type	Total Files	Total File Size (GB)
PROBAV_TRANSFERFRAMES	295	737.84
PROBAV_L1A	2763	1496.95
PROBAV_L1C	2508	2914.41
PROBAV_L2A_100M	2323	2155.86
PROBAV_L2A_300M	6623	1115.46
PROBAV_L2A_1KM	6619	145.57
PROBAV_L3_S1_TOA_100M	77	2224.78
PROBAV_L3_S1_TOC_100M	76	2269.39
PROBAV_L3_S1_TOC_NDVI_100M	77	263.45
PROBAV_L3_S5_TOA_100M	15	1542.80
PROBAV_L3_S5_TOC_100M	16	1701.34
PROBAV_L3_S5_TOC_NDVI_100M	17	205.66
PROBAV_L3_S1_TOA_300M	79	978.78
PROBAV_L3_S1_TOC_300M	78	994.27
PROBAV_L3_S10_TOC_300M	10	200.95
PROBAV_L3_S10_TOC_NDVI_300M	10	18.32
PROBAV_L3_S1_TOA_1KM	78	127.81
PROBAV_L3_S1_TOC_1KM	78	130.91
PROBAV_L3_S10_TOC_1KM	9	24.40
PROBAV_L3_S10_TOC_NDVI_1KM	9	2.01
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	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	2508	104	193
PROBAV_L2A_100M	885	1	273
PROBAV_L2A_300M	2508	35	1087
PROBAV_L2A_1KM	2507	0	13
PROBAV_L3_S1_TOA_100M	30	159	61
PROBAV_L3_S1_TOC_100M	30	268	477
PROBAV_L3_S1_TOC_NDVI_100M	30	2	2
PROBAV_L3_S5_TOA_100M	6	11	11
PROBAV_L3_S5_TOC_100M	6	1016	1008
PROBAV_L3_S5_TOC_NDVI_100M	6	312	399
PROBAV_L3_S1_TOA_300M	30	275	287
PROBAV_L3_S1_TOC_300M	30	124	938
PROBAV_L3_S10_TOC_300M	3	31	28
PROBAV_L3_S10_TOC_NDVI_300M	3	3	12
PROBAV_L3_S1_TOA_1KM	30	90	96
PROBAV_L3_S1_TOC_1KM	30	627	673
PROBAV_L3_S10_TOC_1KM	3	69	74
PROBAV_L3_S10_TOC_NDVI_1KM	3	305	310

Table 6: Ordered and delivered products for this reporting period

### 3.5. End-user activity

12 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 **1451** with **117** different nationalities representing **1088** different companies/universities.

Product type	Africa	Asia	Europe	N-America	Oceania	S-America
PROBAV_L1C	0	428.03	33.69	0	0	0
PROBAV_L2A_100M	0	0	161.03	0	0	0
PROBAV_L2A_300M	0	0.02	175.17	0	0	0
PROBAV_L2A_1KM	0	0.07	0	0	0	0
PROBAV_L3_S1_TOA_100M	0	0.03	2.76	0	0.09	0
PROBAV_L3_S1_TOC_100M	0	205.76	767.70	685.91	0	0
PROBAV_L3_S1_TOC_NDVI_100M	0	0	0.00	0	0	0
PROBAV_L3_S5_TOA_100M	0	0	521.34	0	0	0.01
PROBAV_L3_S5_TOC_100M	16.42	2.88	624.86	0	0	0.29

PROBAV_L3_S5_TOC_NDVI_100M	0	190.10	0.19	0	0	0.61
PROBAV_L3_S1_TOA_300M	0	2.67	939.61	0	0	10.17
PROBAV_L3_S1_TOC_300M	4.73	0	5558.02	293.66	0	0
PROBAV_L3_S10_TOC_300M	1.82	1.02	178.75	0	0	0
PROBAV_L3_S10_TOC_NDVI_300M	0	0.36	1.58	0	0	0.04
PROBAV_L3_S1_TOA_1KM	0	0.08	139.31	0	0	0
PROBAV_L3_S1_TOC_1KM	0	0	1021.57	0	0	0
PROBAV_L3_S10_TOC_1KM	0.58	0	17.71	19.18	0	0
PROBAV_L3_S10_TOC_NDVI_1KM	0	1.89	0.96	0.00	0	0.01

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

Product Type	Global
L1C	461.72
PROBAV_L2A_100M	161.03
PROBAV_L2A_300M	175.20
PROBAV_L2A_1KM	0.07
PROBAV_L3_S1_TOA_100M	2.87
PROBAV_L3_S1_TOC_100M	1659.37
PROBAV_L3_S1_TOC_NDVI_100M	0.00
PROBAV_L3_S5_TOA_100M	521.35
PROBAV_L3_S5_TOC_100M	644.45
PROBAV_L3_S5_TOC_NDVI_100M	190.90
PROBAV_L3_S1_TOA_300M	952.44
PROBAV_L3_S1_TOC_300M	5856.40
PROBAV_L3_S10_TOC_300M	181.59
PROBAV_L3_S10_TOC_NDVI_300M	1.99
PROBAV_L3_S1_TOA_1KM	139.39
PROBAV_L3_S1_TOC_1KM	1021.57
PROBAV_L3_S10_TOC_1KM	37.47
PROBAV_L3_S10_TOC_NDVI_1KM	2.86

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

Company	# Downloads
VITO	1246
LEGOS	603
UCLOUVAIN	548
BROCKMANN CONSULT	507
UPMC	387





<b>ESTEC</b>	319
<b>IWMI</b>	308
<b>EUROPEAN SPACE AGENCY</b>	261
<b>ESA</b>	231
<b>AIRBUS</b>	156

Table 9: Top 10 user companies for the reporting period

<b>Country</b>	<b># Users</b>
<b>CHINA</b>	141
<b>BELGIUM</b>	116
<b>FRANCE</b>	69
<b>UNITED STATES</b>	66
<b>BRAZIL</b>	65
<b>ITALY</b>	65
<b>INDIA</b>	62
<b>UNITED KINGDOM</b>	55
<b>NETHERLANDS</b>	51
<b>GERMANY</b>	48

Table 10: Top 10 countries with most registered users

**List of issues raised by users:**

- PDF: N.A. - 2018/7/13 - Quota
- PDF: N.A. - 2018/7/13
- EOS Inquiry for Proba-V data
- PROBLEM Re: Products of order "C0173684" are available
- SaslExceptions
- Understanding errors in the cluster
- MEP-VM is niet meer ...
- Issue with GPUs - Job does not start
- Installing Theano
- LDAP account / H-SPF
- VM stuck
- Hoe kan de Airflow-dev instantie geheel worden verwijderd, en op opnieuw worden opgestart?
- No access to the docker daemon
- Failed to start MEP jupyter server
- test\_user\_hspf
- Add user to group hspf\_nrt
- airflow-dev.vgt.vito.be nog af en toe onbereikbaar
- Kunnen alle hspf users lid worden van de docker(root) groep?
- Keytab gmgit\_airflow.keytab werkt niet meer.
- [user:j\_leon] cannot access /data/MTDA
- Access to web services on a PROBA-V MEP VM
- Ik kan met ssh niet meer inloggen op mijn VM (TCP poort 22090 van mep.vgt.vito.be)
- Installation of Docker (despite selinux)
- caching van user en group informatie binnen airflow instanties die op yarn draaien
- Airflow dependencies
- airflow-dev.vgt.vito.be down?
- jobdashboard reageert niet meer
- [mep/user:j\_leon] black screen
- airflow-dev.vgt.vito.be onbereikbaar
- Melding nadat rekenjob is aangenomen
- Rekenjobs op cluster
- PROBA-V cloud masking issue tile X20Y07
- Foutmelding
- Is job submitted

## 4. Image Calibration services

### 4.1. Radiometric Calibration

Calibration request type	Total	Processed	Not received	Error
CLOUDS	18	16	2	0
DARK CURRENT	22	20	2	0
MOON	2	2	0	0
RAYLEIGH	50	45	4	1
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	0	1
PROBA-V_L1B_CALIBRATION	231	207	22
PROBA-V_L1B_INTERSECTION	766	237	529
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, Figure 2 and Figure 3. Deep convective clouds interband calibration results are given in Figure 4.

No specific changes in the radiometric calibration results are seen in the latest calibration results.

Three yaw maneuver campaigns (on July 9,18 and 27) are/will be performed over the Niger1 site for the three different cameras in order to validate the equalization results obtained based on the yaw maneuvers from last year.

One new bad pixel (i.e. Left SWIR1 PixelID3 ) was identified (not Pixel ID4 as erroneously listed in Quarterly Calibration report Q2-2018 ).

**Radiometric ICP file**

Both the SWIR and BLUE LEFT/CENTER absolute calibration coefficients will be updated following a linear degradation model, except for the SWIR RIGHT strips. Furthermore, the dark currents will be updated.

The current ICP files are:

- PROBAV\_ICP\_RADIOMETRIC#LEFT\_20180701\_V01
- PROBAV\_ICP\_RADIOMETRIC#CENTER\_20180701\_V01
- PROBAV\_ICP\_RADIOMETRIC#RIGHT\_20180701\_V01

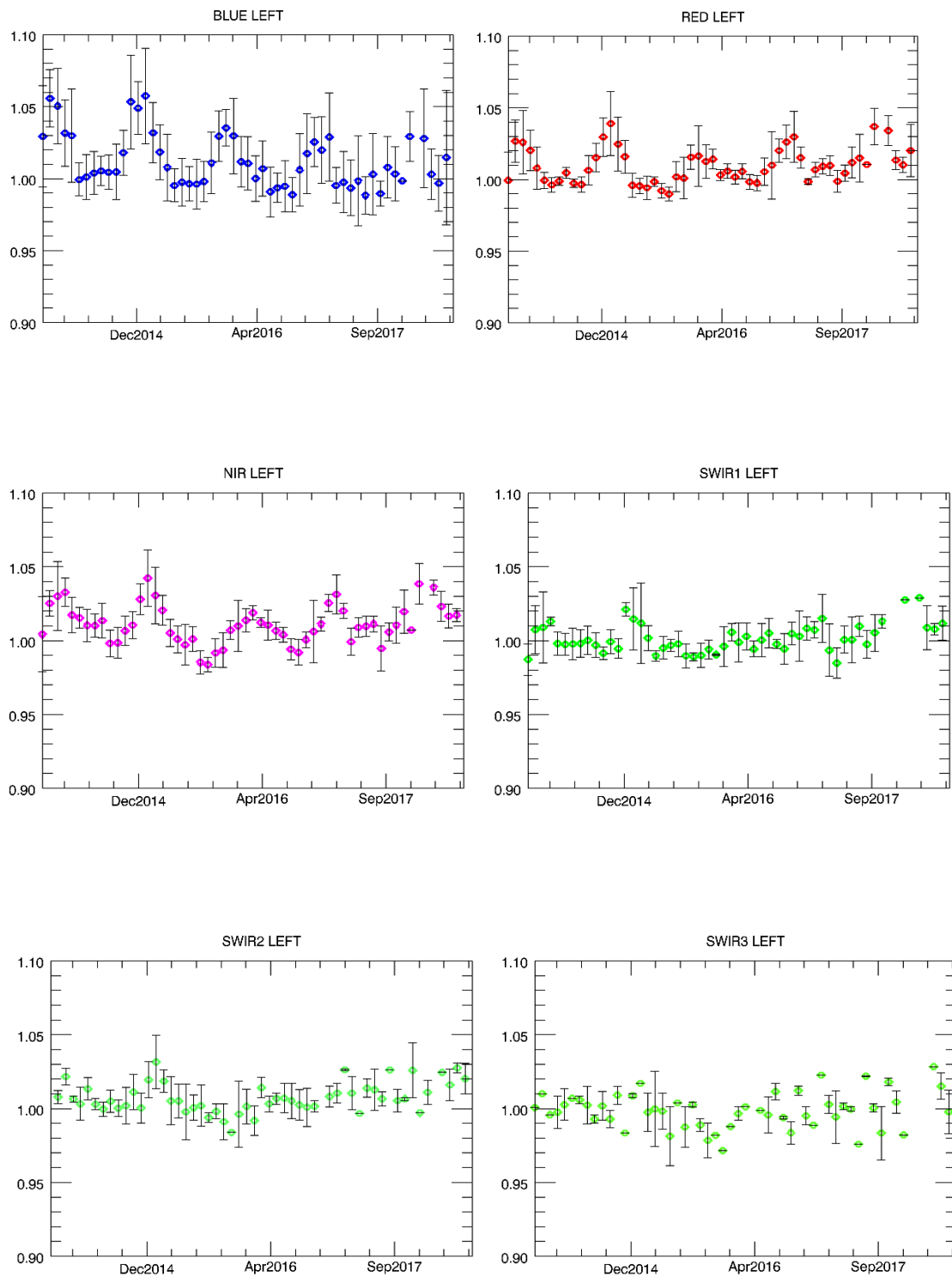


Figure 1. Libya-4 desert calibration results: LEFT monthly averaged results (collection 1)

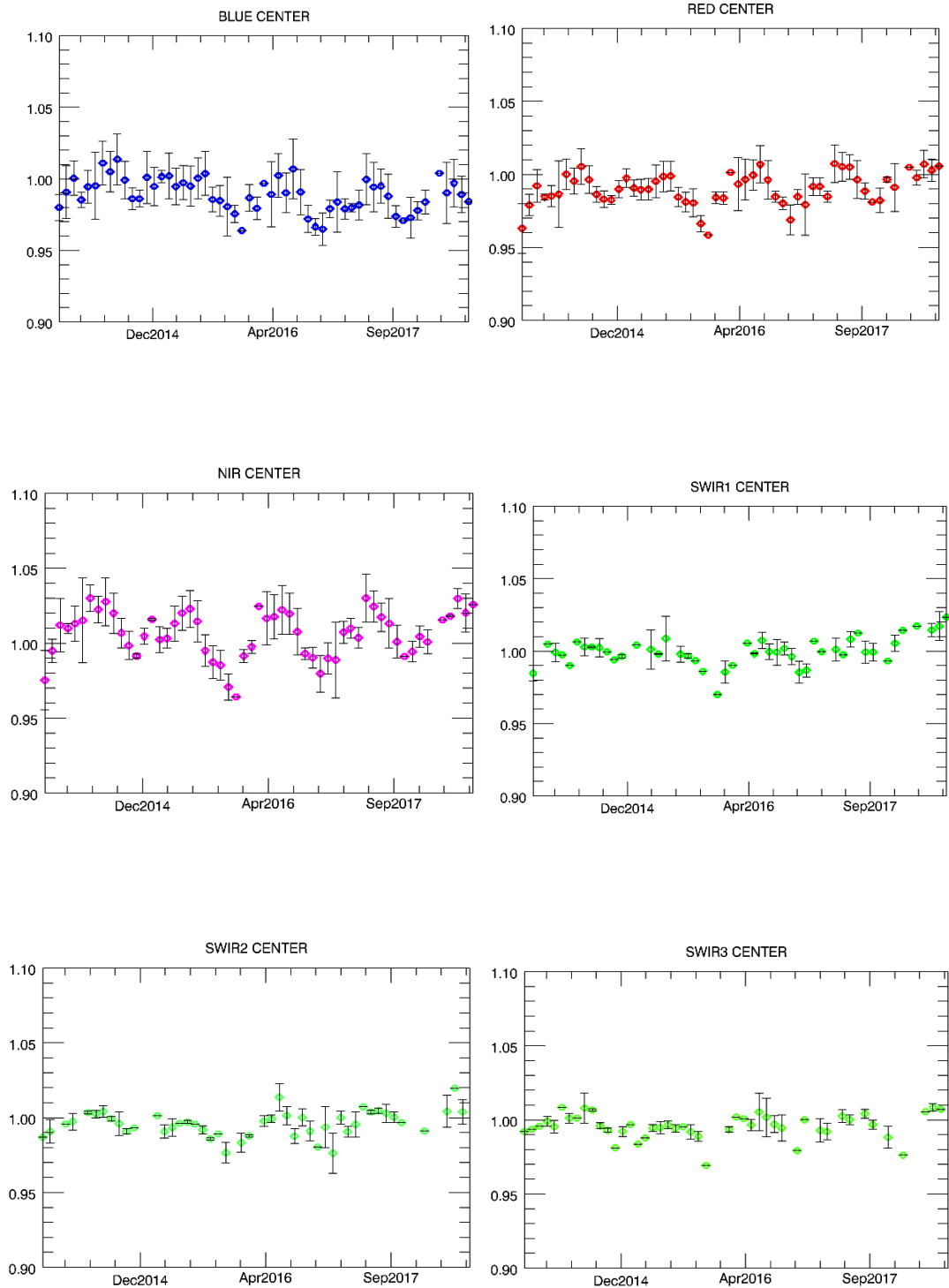


Figure 2. Libya-4 desert calibration results: CENTER monthly averaged results (collection 1)

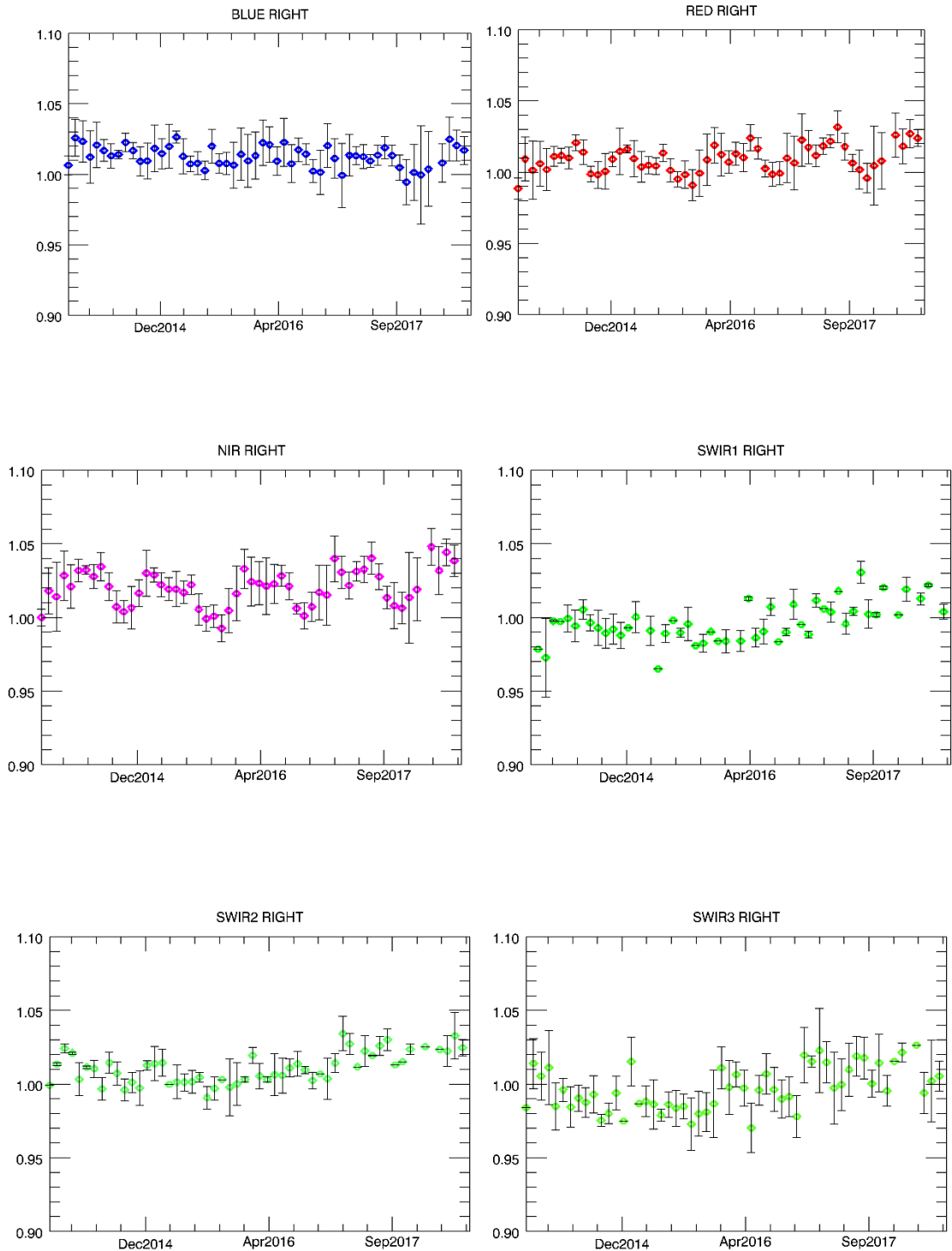


Figure 3. Libya-4 desert calibration results: RIGHT monthly averaged results (collection 1)

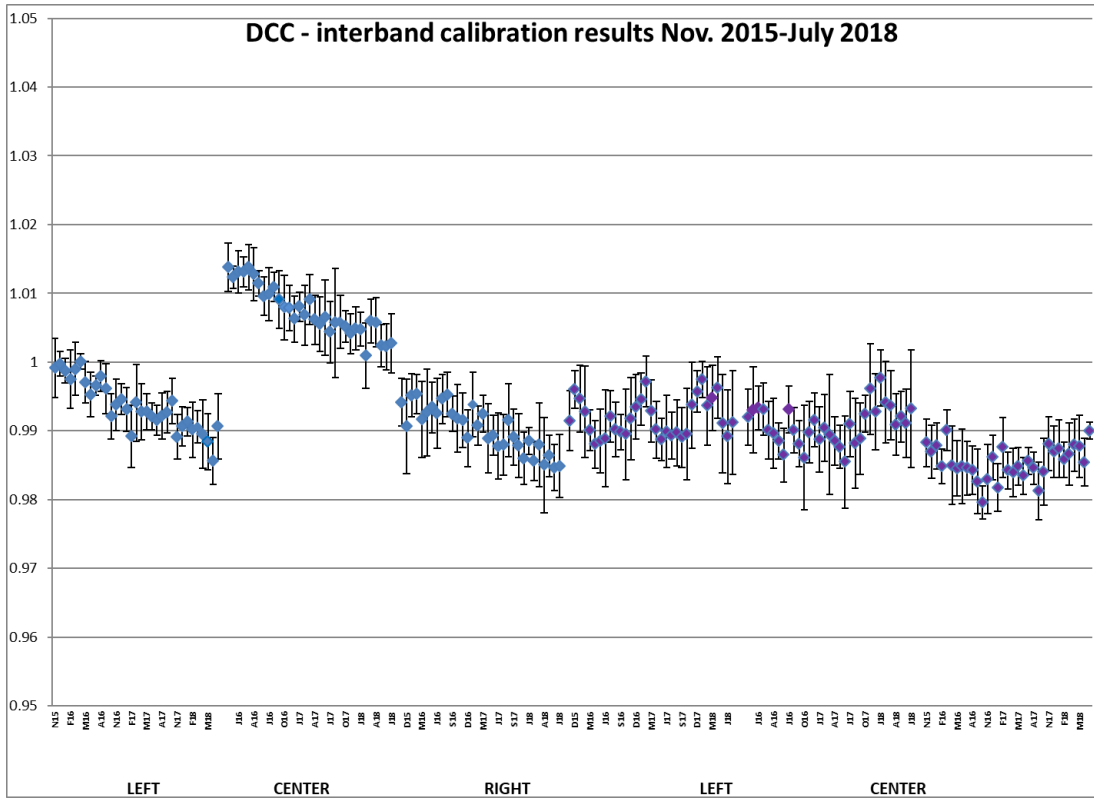


Figure 4. DCC inter-band calibration results: LEFT, CENTER and RIGHT camera (collection 1)



## 4.2. Geometric Calibration

Calibration image type	Total	Processed	Error
PROBA-V_L1C_INTERSECTION	13560	13560	0

Table13: Processed calibration images for this reporting period

Due to a processing issue, we unfortunately can only report on the period 16/6 – 27/6. We will report on the period 28/6 – 15/8 in the next Monthly Operations Report.

The average ALE for 16/6 – 27/6 was < 76 m ( $\sigma < 93$  m). Within this period, the ALE gradually increased to 75 – 80 m on 23/6, shortly dropped, but sharply increased again to 85 – 95 m

### Geometric ICP file

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

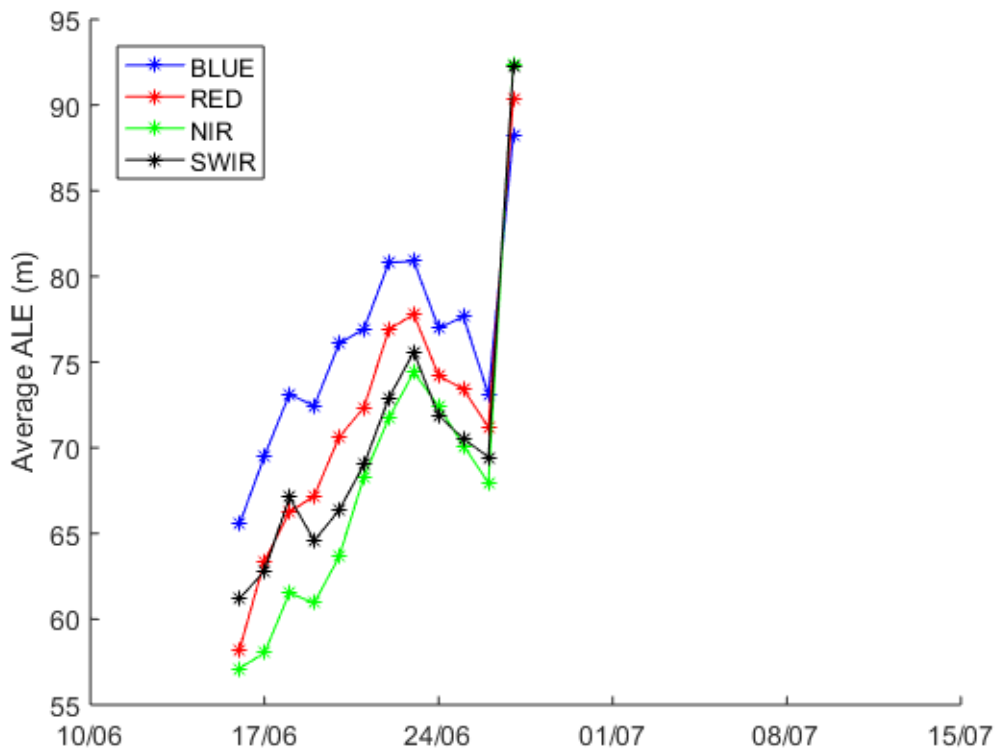


Figure 5 - Daily ALE evolution for 16/6 – 27/6

## 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 issue(s) was resolved and closed during this reporting period
- 1 issues are resolved but remain to be closed formally
- 1 issue is resolved but remain in the list logging purposes
- 7 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 km <sup>2</sup> (missing TFF))	1	27/06
Large Gaps (< 21600 km <sup>2</sup> )	1	09/07
Medium Gaps (< 10000 km <sup>2</sup> )	1	26/06
Minor Gaps (< 3600 km <sup>2</sup> )	5	01/07, 22/06, 17/06, 10/07, 19/06
Negligible Gaps (< 1000 km <sup>2</sup> )	22	23/06, 28/06, 08/07, 13/07, 03/07, 18/06, 15/07, 05/07, 20/06, 30/06, 25/06, 14/07, 04/07, 29/06, 24/06, 11/07, 06/07, 21/06, 16/06, 02/07, 07/07, 12/07
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
20180616	0.00%	1						
20180617	1.42%	1	5		1		1	
20180618	0.02%	1	3					
20180619	1.34%	3	8		1			
20180620	0.26%	3	6		1			
20180621	0.04%	3	8					
20180622	1.93%	4	10		1			
20180623	0.02%	3	9					
20180624	0.03%		6					
20180625	0.00%	1						
20180626	6.88%	2	10	1				1
20180627	36.88%	2	1	4				1
20180628	0.01%	2	2					
20180629	0.00%	1						
20180630	4.03%	3	1					
20180701	1.79%	5	2		1		1	
20180702	0.07%		6					
20180703	0.02%	2	3					
20180704	0.05%	1	5					
20180705	0.17%		4					1
20180706	0.06%	4	2					
20180707	0.35%	3	7			1		
20180708	0.02%	1	2			1		
20180709	8.09%		8					
20180710	4.21%	5	7		1			
20180711	0.04%	5	3					
20180712	0.01%		2					
20180713	0.02%	1	5			1		
20180714	0.34%	8	4					
20180715	0.08%	2	2					

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
- On 18 and 27<sup>th</sup> of June, a yaw manoeuvre is planned in order to improve the radiometric quality of the different cameras.

## 7. Operational remarks

No operational remarks