



# MONTHLY OPERATIONS REPORT

**MOR#040**

**Reporting period from 16-Mar-2017 to 15-Apr-2017**

**Reference: *PROBA-V\_D5\_MOR-040\_2017-04\_v1.0***

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## 1. Summary

In this reporting period, more than half of the synthesis products had no or negligible gaps. Other synthesis products were impacted by quite some missing transfer frame files (TFF), due to high winds at the reception station, missing support or no tracking at all. Other anomalies impacting the data were automatic recoveries of the platform and some missing VC4 data. Some TFF's were delivered late, causing VITO to deliver some of their products later than average.

On April 12, a planned maintenance was executed on the VITO Firewall with only minimal downtime for the end-users of the PDF portal.

There were no major issues with the image quality during this reporting period for the radiometric or geometric quality.

A validation of the entire reprocessed archive (Collection 1) is ongoing. Results will be publicly published as soon as they are available. Furthermore, a new release of the PROBA-V main website is under construction. The new site will be released on the 4<sup>th</sup> birthday of PROBA-V. No other developments or upgrades are expected in the following period.

Since the full release of Collection 1, L2A products are also distributed and are therefore also integrated into this report from now on.

## 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	97.14	2.86 <sup>(*)</sup>
PDF	100.0	0.0

*Table 1: System Infrastructure availability for this reporting period*

(\*) Worker nodes: Pnode 7 was 16.15%% down and 83.85% undetermined due to hardware failure (will be replaced)

## 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	310	303	7 <sup>(*)</sup>	303

*Table 2: Ingested and archived products for this reporting period*

<sup>(\*)</sup> 7 x missing TFF: TFF 12845, 12978 - No DCR file available; TFF 12908, 12909, 12910 - cancelled due to strong winds, TFF 13078 - Antenna tracking, but no data for this pass, TFF 13104 - Due to LEOP activities required on the USAK01 ground station, pass was no longer supported. TFF 12922, 12926, 12937 - TFF number was missing but no data was lost.

## 3.2. Generated and archived products

Product Type	Total	Processed	Error	Archived
PROBAV_L1A - Calibration	277	277	0	277
PROBAV_L1A - Nominal	2592	2588	5 <sup>(*)</sup>	2592
PROBAV_L1C	2588	2588	0	2587
PROBAV_L2A_100M	909	909	0	909
PROBAV_L2A_300M	2588	2588	0	2587
PROBAV_L2A_1KM	2588	2588	0	2588
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

(\*) 5x L1A Error: Error Geometric processing

## 3.3. Backup and archiving service

Product type	Total Files	Total File Size (GB)
TFF	303	774.92
L1A	2785	1373.44
Database transaction logs	1056	85.57
Database incremental back-up	0	0.0
Database full back-up	15	1206.17

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

Product type	Total Files	Total File Size (GB)
PROBAV_TRANSFERFRAMES	302	857.58
PROBAV_L1A	2873	1523.87
PROBAV_L1C	3708	4263.28
PROBAV_L2A_100M	2428	2127.05
PROBAV_L2A_300M	8033	1297.86
PROBAV_L2A_1KM	8913	189.47
PROBAV_L3_S1_TOA_100M	81	2173.69
PROBAV_L3_S1_TOC_100M	79	2201.54
PROBAV_L3_S1_TOC_NDVI_100M	66	200.60
PROBAV_L3_S5_TOA_100M	15	1562.88
PROBAV_L3_S5_TOC_100M	12	1250.14
PROBAV_L3_S5_TOC_NDVI_100M	14	151.99
PROBAV_L3_S1_TOA_300M	66	781.87
PROBAV_L3_S1_TOC_300M	80	975.04
PROBAV_L3_S10_TOC_300M	10	205.65
PROBAV_L3_S10_TOC_NDVI_300M	8	14.21
PROBAV_L3_S1_TOA_1KM	94	151.09
PROBAV_L3_S1_TOC_1KM	79	129.38
PROBAV_L3_S10_TOC_1KM	7	21.44
PROBAV_L3_S10_TOC_NDVI_1KM	10	2.16
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	248	0.31
METEO_METEOSERVICES	248	1.32
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	2526	176	185
PROBAV_L2A_100M	904	2193	2181
PROBAV_L2A_300M	2587	118	118
PROBAV_L2A_1KM	2589	23	23
PROBAV_L3_S1_TOA_100M	30	1165	869
PROBAV_L3_S1_TOC_100M	30	765	1426
PROBAV_L3_S1_TOC_NDVI_100M	31	116	153
PROBAV_L3_S5_TOA_100M	6	339	335
PROBAV_L3_S5_TOC_100M	6	836	1080
PROBAV_L3_S5_TOC_NDVI_100M	6	780	812
PROBAV_L3_S1_TOA_300M	31	170	177
PROBAV_L3_S1_TOC_300M	31	895	2031
PROBAV_L3_S10_TOC_300M	3	84	183
PROBAV_L3_S10_TOC_NDVI_300M	3	167	478
PROBAV_L3_S1_TOA_1KM	31	137	143
PROBAV_L3_S1_TOC_1KM	31	387	395
PROBAV_L3_S10_TOC_1KM	3	219	228
PROBAV_L3_S10_TOC_NDVI_1KM	3	445	487

Table 6: Ordered and delivered products for this reporting period

### 3.5. End-user activity

22 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 **1107** with **105** different nationalities representing **842** different companies/universities.

Product type	Africa	Asia	Europe	N-America	Oceania	S-America
PROBAV_L1C	2.65	374.57	182.50	0	0	0
PROBAV_L2A_100M	0.02	1281.55	31.49	0	0	0
PROBAV_L2A_300M	0	0	0.59	0	0	0
PROBAV_L2A_1KM	0	0	0.23	0	0	0
PROBAV_L3_S1_TOA_100M	0	0.00	13.41	1.17	0	89.80
PROBAV_L3_S1_TOC_100M	0	1547.05	5126.38	996.41	0	0
PROBAV_L3_S1_TOC_NDVI_100M	0	17.38	0.39	0.12	0	0
PROBAV_L3_S5_TOA_100M	0	0.06	1.88	0	0	612.37
PROBAV_L3_S5_TOC_100M	36.82	2.87	628.19	0	0	0



PROBAV_L3_S5_TOC_NDVI_100M	0	6.76	328.96	0	0	1.58
PROBAV_L3_S1_TOA_300M	0	2.57	1039.08	0	0	0
PROBAV_L3_S1_TOC_300M	0	11.14	5547.10	446.13	0	17.59
PROBAV_L3_S10_TOC_300M	3.87	1.05	246.06	8.42	0	0
PROBAV_L3_S10_TOC_NDVI_300M	3.24	2.29	0.05	48.93	0	0.11
PROBAV_L3_S1_TOA_1KM	0	0	155.65	0	0	0
PROBAV_L3_S1_TOC_1KM	0.00	0.04	209.88	0.03	0	0
PROBAV_L3_S10_TOC_1KM	0.10	0	314.25	0.87	0	0
PROBAV_L3_S10_TOC_NDVI_1KM	0.62	6.87	4.09	0.21	0	0.12

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

Product Type	Global
L1C	559.72
PROBAV_L2A_100M	1313.07
PROBAV_L2A_300M	0.59
PROBAV_L2A_1KM	0.23
PROBAV_L3_S1_TOA_100M	104.38
PROBAV_L3_S1_TOC_100M	7669.84
PROBAV_L3_S1_TOC_NDVI_100M	17.89
PROBAV_L3_S5_TOA_100M	614.31
PROBAV_L3_S5_TOC_100M	667.87
PROBAV_L3_S5_TOC_NDVI_100M	337.29
PROBAV_L3_S1_TOA_300M	1041.65
PROBAV_L3_S1_TOC_300M	6021.96
PROBAV_L3_S10_TOC_300M	259.39
PROBAV_L3_S10_TOC_NDVI_300M	54.62
PROBAV_L3_S1_TOA_1KM	155.65
PROBAV_L3_S1_TOC_1KM	209.94
PROBAV_L3_S10_TOC_1KM	315.22
PROBAV_L3_S10_TOC_NDVI_1KM	11.92

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

Company	# Downloads
VITO	1511
LAPIG	1067
CAS	879
UCLOUVAIN	825
JXNU	782



CNES	626
GOOGLE	550
UNIVERSITÄT BAYREUTH	466
IFSULDEMINAS	458
IKI-RAS	357

Table 9: Top 10 user companies for the reporting period

Country	# Users
CHINA	112
BELGIUM	94
ITALY	57
FRANCE	56
UNITED STATES	51
BRAZIL	48
UNITED KINGDOM	44
INDIA	39
GERMANY	38
NETHERLANDS	35

Table 10: Top 10 countries with most registered users

**List of issues raised by users:**

- Problem with the website
- PROBA-V C1 local disk error [URGENT]
- PROBA MEP VM creation
- soucis commandes Proba-V
- apparent offset in NDVI
- Available free satellite data
- PROBA-V cloud mask question
- Your ESA order
- Re: Proba-V
- your PROBA-V orders

## 4. Image Calibration services

### 4.1. Radiometric Calibration

Calibration request type	Total	Processed	Not received	Error
CLOUDS	21	15	6	0
DARK CURRENT	26	19	7	0
MOON	2	2	0	0
RAYLEIGH	63	47	16	0
SNOW	9	8	1	0
SUN_GLINT	0	0	0	0

Table 11: Calibration Image requests for this reporting period

Calibration image type	Total	Valid	Invalid <sup>(*)</sup>
PROBA_V_L1A_CALIBRATION	2	2	0
PROBA-V_L1B_CALIBRATION	275	108	103
PROBA-V_L1B_INTERSECTION	827	375	436
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. Please note that reporting is done for "collection 1" ICP files.

As reporting in previous monthly report a degradation model has to be implemented to correct for the observed degradation in the calibration results for the LEFT BLUE and CENTER BLUE strips. In order to define the best coefficients for the degradation model various desert sites are being reprocessed with the "collection 1" ICP files. As this reprocessing takes a bit longer than expected, a degradation was not yet applied for the latest ICP update (i.e. April 1). It is now foreseen for the next ICP update (i.e. May 1)

One new bad pixel i.e. center swir3 pixel ID 804 (0-based) has been assigned the status bad in the ICP update of April 1.

### Radiometric ICP file

Both the SWIR and 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\_20170401\_V01
- PROBAV\_ICP\_RADIOMETRIC#CENTER\_20170401\_V01
- PROBAV\_ICP\_RADIOMETRIC#RIGHT\_20170401\_V01

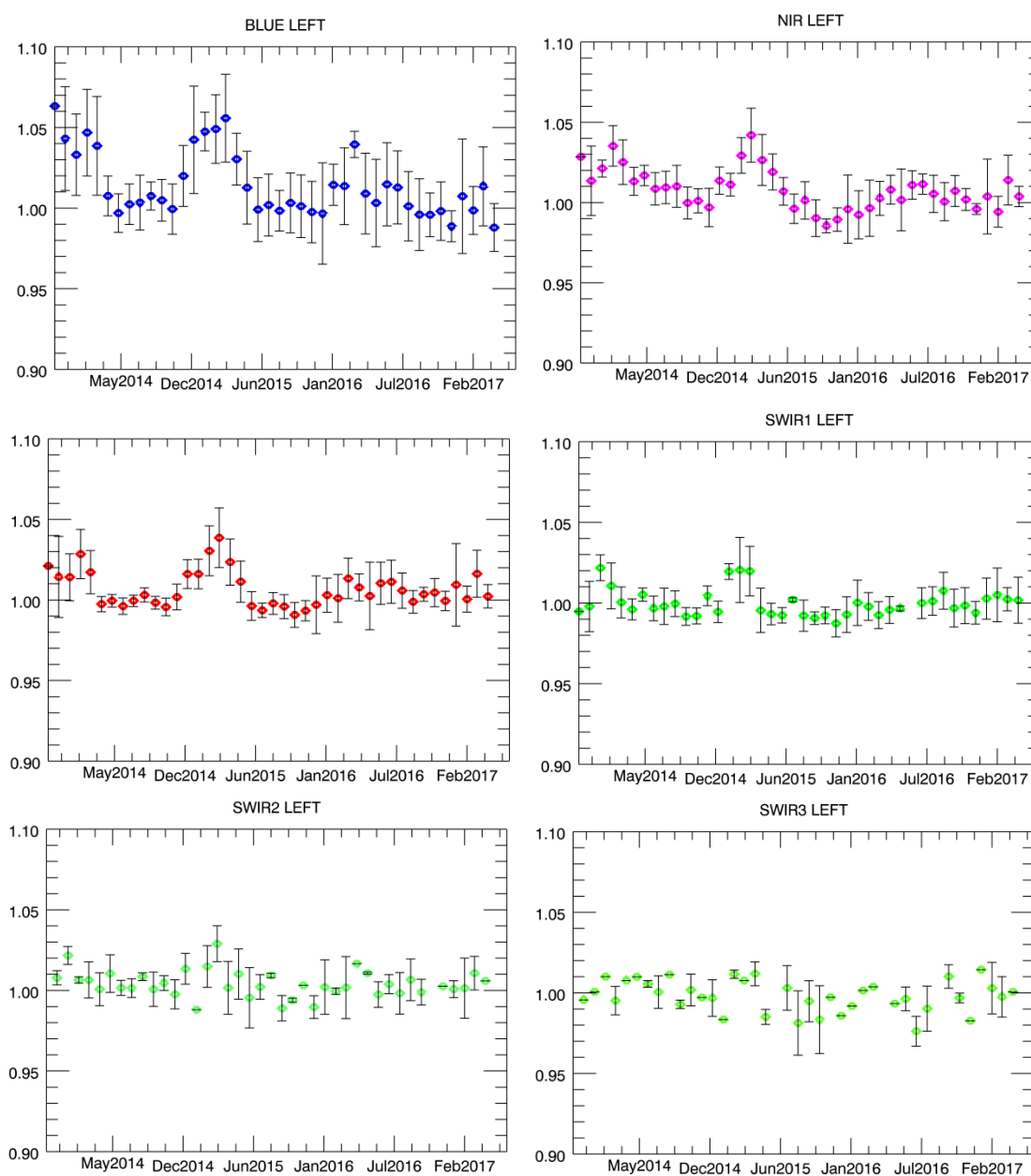


Figure 1. Libya-4 desert calibration results: LEFT monthly averaged results (collection 1)

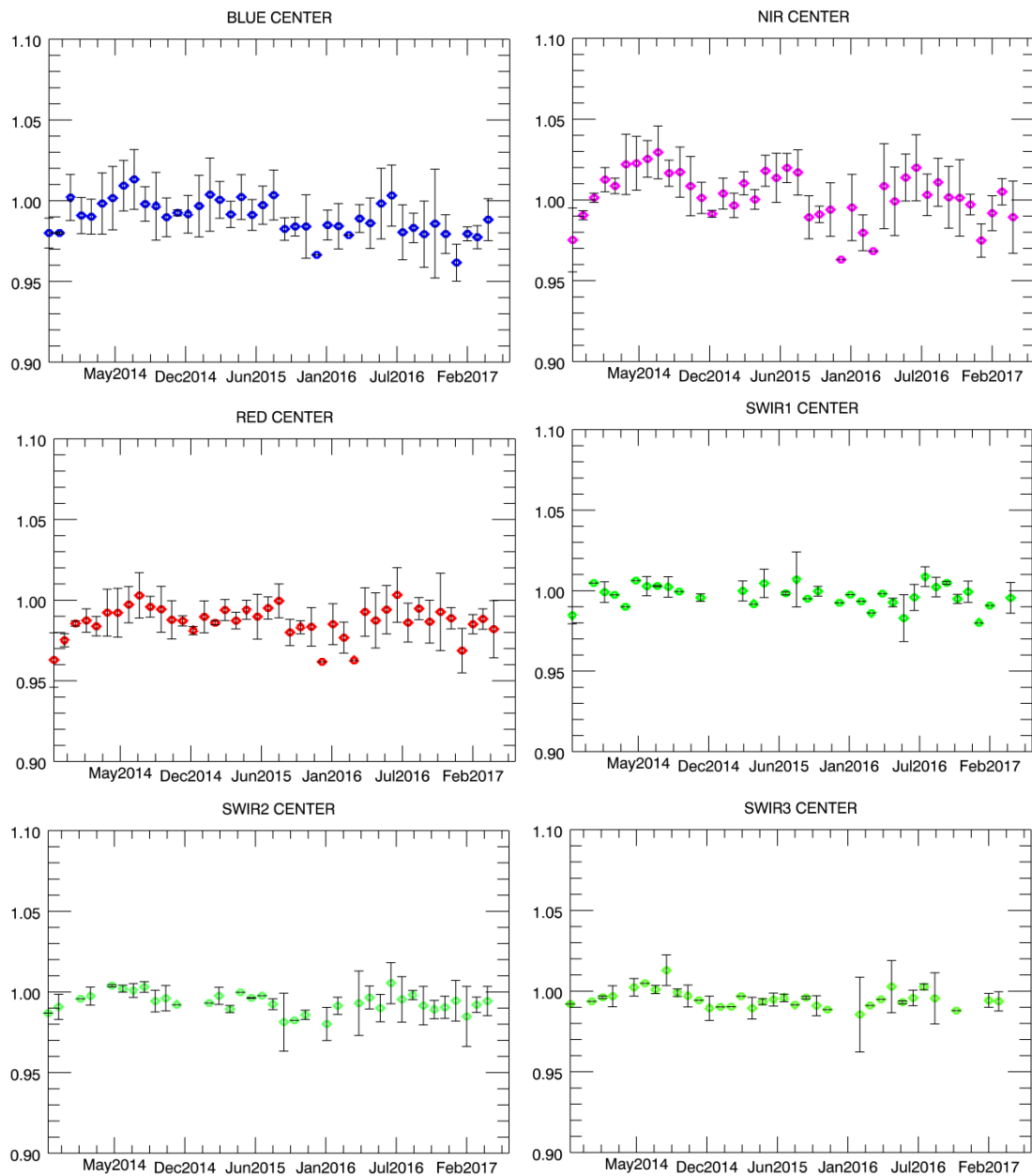


Figure 2. Libya-4 desert calibration results: CENTER monthly averaged results (collection 1)

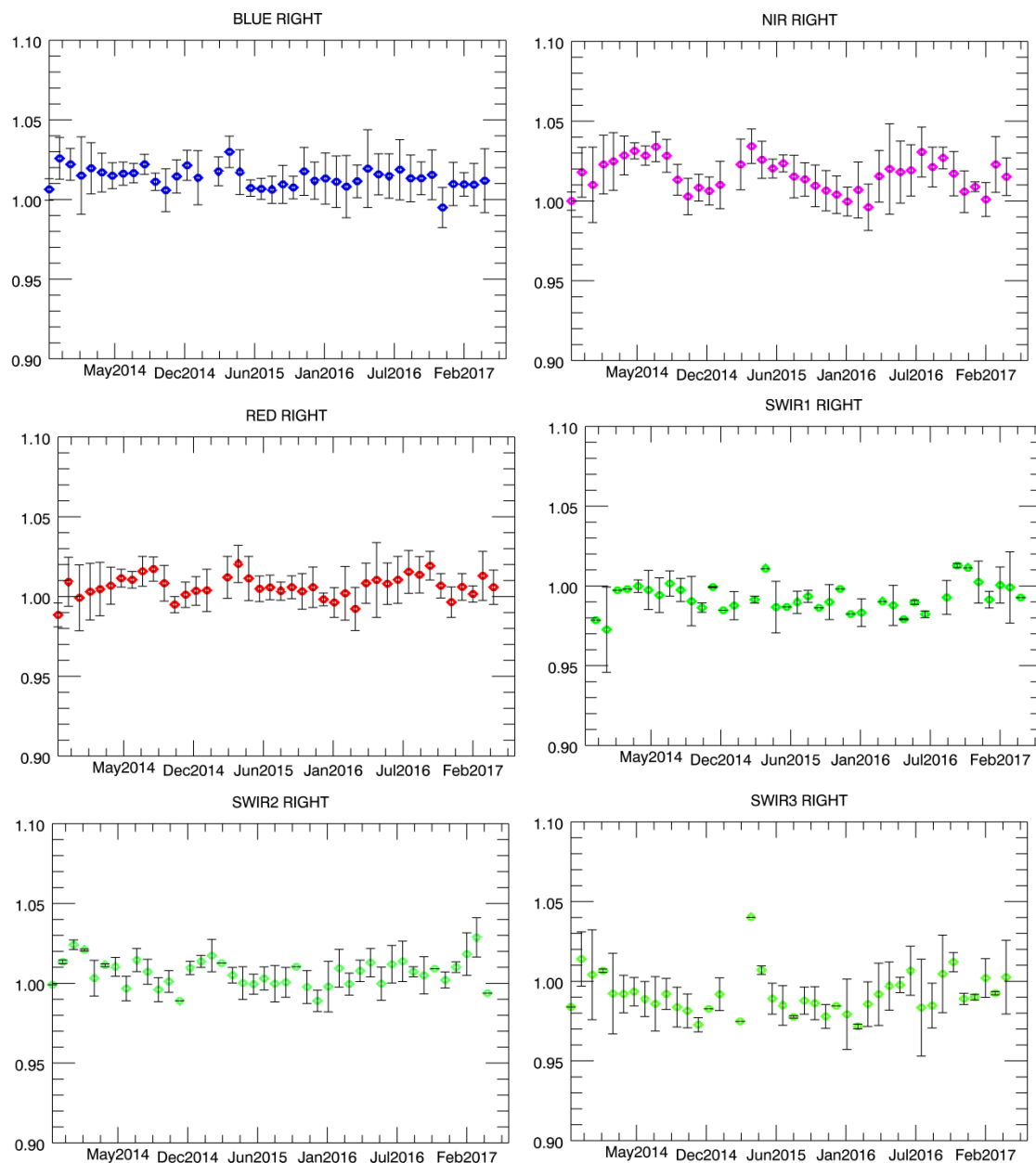


Figure 3. Libya-4 desert calibration results: *RIGHT* monthly averaged results (collection 1)

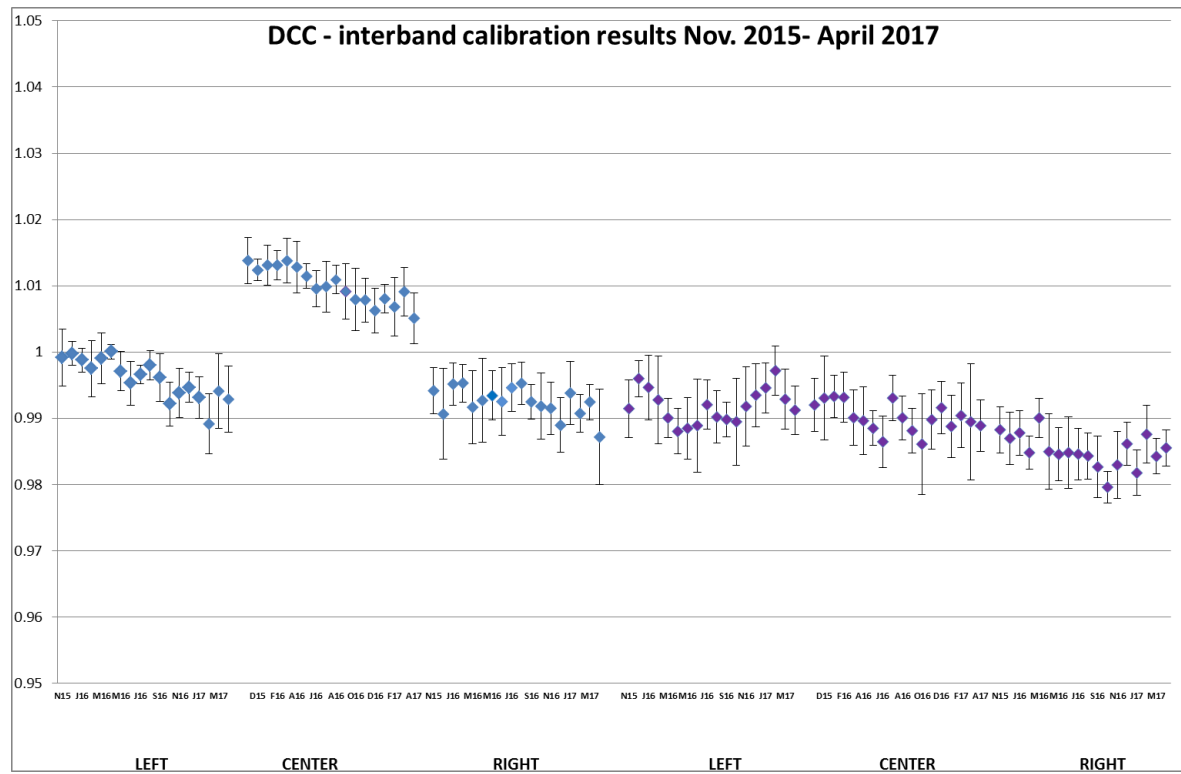


Figure 4. DCC inter-band calibration results: LEFT, CENTER and RIGHT camera (collection 1)

## 4.2. Geometric Calibration

Calibration image type	Total	Processed	Error
PROBA-V_L1C_INTERSECTION	13977	13977	0

Table13: Processed calibration images for this reporting period

During previous month, the average ALE was  $< 74$  m ( $\sigma < 93$  m). Daily values started off at 60 – 65 m and increased to 90 – 100 m at 24/3. After a decline to 60 – 70 m between 27/3 and 31/3, ALE values rapidly increased again to peak values between 88 m and 96 m. This peak was followed by a decrease to much lower values of 55 – 70 m from 8/4 onwards.

The geometric accuracy was within the requirement of  $< 300$  m, with an average compliance for all cameras of 99.2% (98.8% - 99.7% from BLUE to SWIR). Daily values showed the usual correspondence with the ALE maxima.

### Geometric ICP file

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

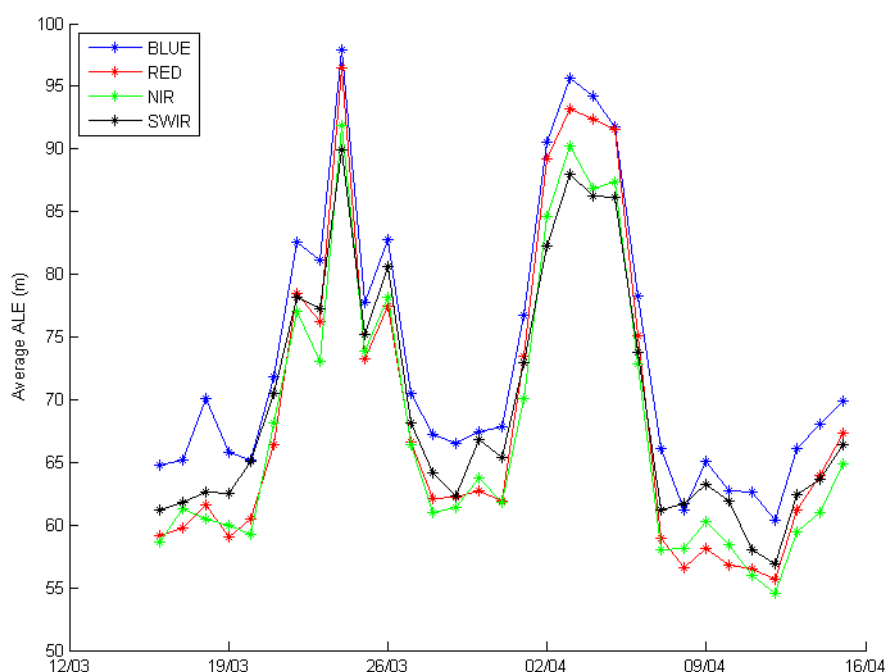


Figure 5: Daily ALE evolution for all PROBA-V spectral bands for 16/3/2017 – 15/4/2017.





## 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	Open	16/09/2016	Software
<a href="#">PROBAVUS-66</a>	Cloud cover percentages on PDF products are not reliable	Open	19/10/2016	PDF
<a href="#">PROBAVUS-68</a>	ICP file version not taken into account when processing	Open	20/03/2017	Software
<a href="#">PROBAVUS-69</a>	Version number of segment not filtered when querying for syntheses	Open	20/03/2017	Software

1 new issue was logged during this reporting period  
0 issue(s) were resolved and closed during this reporting period  
0 issues are resolved but remain to be closed formally  
1 issue are resolved but remain in the list logging purposes  
5 issue(s) is open and remain to be solved

## 5.2. Image processing issues

A detailed description of each issue is available in 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))	5	02/04, 26/03, 12/04, 19/03, 14/04
Large Gaps (< 21600 km <sup>2</sup> )	1	20/03
Medium Gaps (< 10000 km <sup>2</sup> )	3	22/03, 08/04, 06/04
Minor Gaps (< 3600 km <sup>2</sup> )	5	17/03, 13/04, 27/03, 24/03, 09/04
Negligible Gaps (< 1000 km <sup>2</sup> )	14	10/04, 05/04, 31/03, 15/04, 23/03, 21/03, 16/03, 04/04, 07/04, 28/03, 29/03, 03/04, 11/04, 01/04
Complete synthesis (no gaps)	3	18/03, 25/03, 30/03

Table14: Overview of S1 for this reporting period

Synthesis	Missing	Decom. Error	Geom. Error	Missing TFF	Autom. Recovery	VC4 Missing	Create Contours	Other
20170316	0.02%		3					
20170317	0.89%	4	7		1			
20170318	0.00%							
20170319	0.02%	1	3					1
20170320	9.82%	7	7	1	1			
20170321	0.00%		2					
20170322	1.20%	5	2		1			
20170323	0.01%	2						
20170324	0.09%	2	1			1		
20170325	0.00%							
20170326	28.72%	3	3	3		1		
20170327	1.66%	5	3		1			
20170328	0.01%	2						
20170329	0.03%		4					
20170330	0.00%							
20170331	0.35%		8				3	
20170401	0.01%		1					
20170402	7.21%	2	1	1			1	
20170403	0.03%	1	4					
20170404	0.01%		1					
20170405	0.20%	1	3					
20170406	2.66%	3	4		1			
20170407	0.01%	2						
20170408	0.03%	1	6			1		
20170409	6.67%	4	4		1	1		
20170410	0.46%	7	3			2		
20170411	0.00%		1					
20170412	7.12%	3		1				1
20170413	2.19%	6	3		1			
20170414	8.27%	4		1				
20170415	0.01%	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
- A validation of the entire reprocessed archive is ongoing. Full details will be published via the PROBA-V website.

## 7. Operational remarks

A new website for PROBA-V is under construction. The website will be released on the 4<sup>th</sup> birthday of PROBA-V: 07/05/2017.