MONTHLY OPERATIONS REPORT

MOR#044

Reporting period from 16-Jul-2017 to 15-Aug-2017

DOCUMENT CONTROL

Signatures

Author(s)	Dennis Clarijs, Sindy Sterckx, Flip Boonen, Lieve Van den Heuvel
Reviewer(s)	Lieve Van den Heuvel
Approver(s)	Dennis Clarijs
Issuing authority	

Change record

Release	Date	Pages	Description	Editor(s)/Reviewer(s)
1.0	17/08/2017	All	Initial version	

TABLE OF CONTENT

1. Summary

In this reporting period some synthesis products have missing data, mostly due to missing transfer frame files or problems with the overpasses. The amount of decompression errors remains stable (and low) after the first yaw manoeuvre on July 3, 2017.
The yaw manoeuvre for the LEFT camera on the 21st of July was not executed as planned due to an error in the uploaded attitude files. Possible alternative opportunities will be looked for.

On July 24 2017, VITO experienced a power interruption on the 100M processing rack; this caused a small delay in the delivery of the 100M data for that day.

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

On August 9th 2017, the PDF database server was successfully upgraded with minimal downtime.

A complete validation of the Collection 1 data revealed some minor issues cause of the reprocessing. These are currently under investigation and will be structurally addressed in the following reporting period. Documentation of the complete validation of Collection 1 will be published in the following reporting 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	99.97	0.03[*]
Worker Nodes	97.13	2.87[**]
PDF	100.0	0.0

Table 1: System Infrastructure availability for this reporting period

[*] Pmaster17 downtime due to technical problems – no effect on product delivery.
[**] Downtime on some 100m workers due to the power interruption on 24/07.

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	307	3 (*)	307

Table 2: Ingested and archived products for this reporting period

(*) 1 missing TFF on 10/08/2017 (TFF 14278 missing Pass Lost - antenna did not move)
2 missing TFF's on 15/08/2017 (TFF 14334 Subject: Antenna problem during pass - TFF 14326: Automatic on-board reconfiguration during overpass: loss of signal)

3.2. Generated and archived products

Product Type	Total	Processed	Error(*)	Archived
PROBAV_L1A - Calibration	263	263	0	263
PROBAV_L1A - Nominal	2631	2629	2	2630
PROBAV_L1C	2629	2629	0	2629
PROBAV_L2A_100M	921	921	0	916
PROBAV_L2A_300M	2629	2629	0	2629
PROBAV_L2A_1KM	2629	2629	0	2629
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	30
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

(*) 2 x L1A error: L1A error due geometric processing

3.3. Backup and archiving service

Product type	Total Files	Total File Size (GB)
TFF	306	705.26
L1A	2849	1439.94
Database transaction logs	795	134.31
Database incremental back-up	48	24.96
Database full back-up	5	144.4

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

Product type	Total Files	Total File Size (GB)
PROBAV_TRANSFERFRAMES	288	718.55
PROBAV_L1A	2724	1466.41
PROBAV_L1C	4310	4891.77
PROBAV_L2A_100M	1501	1143.26
PROBAV_L2A_300M	3221	481.80
PROBAV_L2A_1KM	3225	67.81
PROBAV_L3_S1_TOA_100M	39	1006.07
PROBAV_L3_S1_TOC_100M	37	973.66
PROBAV_L3_S1_TOC_NDVI_100M	39	121.83
PROBAV_L3_S5_TOA_100M	6	558.97
PROBAV_L3_S5_TOC_100M	8	812.14
PROBAV_L3_S5_TOC_NDVI_100M	7	74.26
PROBAV_L3_S1_TOA_300M	40	462.05
PROBAV_L3_S1_TOC_300M	35	408.96
PROBAV_L3_S10_TOC_300M	4	88.30
PROBAV_L3_S10_TOC_NDVI_300M	5	8.84
PROBAV_L3_S1_TOA_1KM	36	60.11
PROBAV_L3_S1_TOC_1KM	42	71.06
PROBAV_L3_S10_TOC_1KM	5	15.39
PROBAV_L3_S10_TOC_NDVI_1KM	4	0.93
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	232	0.29
METEO_METEOSERVICES	231	1.23
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	2633	177	177
PROBAV_L2A_100M	924	47	51
PROBAV_L2A_300M	2631	154	153
PROBAV_L2A_1KM	2633	3	4
PROBAV_L3_S1_TOA_100M	31	38	34
PROBAV_L3_S1_TOC_100M	31	1640	611
PROBAV_L3_S1_TOC_NDVI_100M	31	1018	830
PROBAV_L3_S5_TOA_100M	6	50	51
PROBAV_L3_S5_TOC_100M	6	1042	1051
PROBAV_L3_S5_TOC_NDVI_100M	6	372	659
PROBAV_L3_S1_TOA_300M	31	305	314
PROBAV_L3_S1_TOC_300M	31	159	809
PROBAV_L3_S10_TOC_300M	3	36	35
PROBAV_L3_S10_TOC_NDVI_300M	3	375	458
PROBAV_L3_S1_TOA_1KM	31	128	138
PROBAV_L3_S1_TOC_1KM	31	210	210
PROBAV_L3_S10_TOC_1KM	3	12	20
PROBAV_L3_S10_TOC_NDVI_1KM	3	371	379

Table 6: Ordered and delivered products for this reporting period

3.5. End-user activity

17 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 **1201** with **111** different nationalities representing **905** different companies/universities.

Product type	Africa	Asia	Europe	N-America	Oceania	S-America
PROBAV_L1C	0	364.91	173.93	0	0	0
PROBAV_L2A_100M	0	0	7.27	2.59	0	1.85
PROBAV_L2A_300M	0	0.26	0.24	0	0	0
PROBAV_L2A_1KM	0	0	0.05	0	0	0
PROBAV_L3_S1_TOA_100M	0	0.04	4.86	0	0	0

PROBAV_L3_S1_TOC_100M	0	734.70	776.96	719.08	0	0.01
PROBAV_L3_S1_TOC_NDVI_100M	3.42	0.13	0.57	0	0	0.01
PROBAV_L3_S5_TOA_100M	3.31	0	3.51	0	0	1.97
PROBAV_L3_S5_TOC_100M	33.18	0	738.87	0	0.00	189.52
PROBAV_L3_S5_TOC_NDVI_100M	10.07	21.73	12.13	14.60	0	0.57
PROBAV_L3_S1_TOA_300M	0	0.50	1025.44	0	0	1399.41
PROBAV_L3_S1_TOC_300M	0	4.88	1072.31	320.35	0	3.09
PROBAV_L3_S10_TOC_300M	1.88	1.05	202.39	0	0	0.10
PROBAV_L3_S10_TOC_NDVI_300M	0	3.14	3.26	0.02	0	0.79
PROBAV_L3_S1_TOA_1KM	0	0.02	151.44	0	0	0
PROBAV_L3_S1_TOC_1KM	0.00	0	209.35	0	0	0
PROBAV_L3_S10_TOC_1KM	0	0	17.90	0.88	0	0
PROBAV_L3_S10_TOC_NDVI_1KM	0.09	2.30	5.49	0	0	0.02

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

Product Type	Global
L1C	538.84
PROBAV_L2A_100M	11.71
PROBAV_L2A_300M	0.50
PROBAV_L2A_1KM	0.05
PROBAV_L3_S1_TOA_100M	4.90
PROBAV_L3_S1_TOC_100M	2230.75
PROBAV_L3_S1_TOC_NDVI_100M	4.13
PROBAV_L3_S5_TOA_100M	8.78
PROBAV_L3_S5_TOC_100M	961.57
PROBAV_L3_S5_TOC_NDVI_100M	59.10
PROBAV_L3_S1_TOA_300M	2425.35
PROBAV_L3_S1_TOC_300M	1400.63
PROBAV_L3_S10_TOC_300M	205.42
PROBAV_L3_S10_TOC_NDVI_300M	7.20
PROBAV_L3_S1_TOA_1KM	151.46
PROBAV_L3_S1_TOC_1KM	209.35
PROBAV_L3_S10_TOC_1KM	18.78
PROBAV_L3_S10_TOC_NDVI_1KM	7.90

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

Company	# Downloads
FAO	790

VITO	615
UNIVERSITY OF LEICESTER	501
LEGOS	497
TU DELFT	343
PHILIPP UNIVERSITY OF MARBURG	268
UNIVERSITY OF CHIBA	218
SASSCAL	185
RSPB	184
R&D	175

Table 9: Top 10 user companies for the reporting period

Country	# Users
CHINA	115
BELGIUM	98
ITALY	62
FRANCE	59
UNITED STATES	56
BRAZIL	54
UNITED KINGDOM	48
INDIA	47
GERMANY	43
NETHERLANDS	41

Table 10: Top 10 countries with most registered users

List of issues raised by users:

ProbaV:
- S5 TOC 100 m [C1] and NDVI
- PROBA-V Mission Exploitation Platform - I/O errors
- ROBA-V Mission Exploitation Platform - no access to virtual machine
- Demande info PROBA-V
- Proba-v versioning
- Forgot user ID

4. Image Calibration services

4.1. Radiometric Calibration

Calibration request type	Total	Processed	Not received	Error
CLOUDS	16	16	0	0
DARK CURRENT	24	24	0	0
MOON	2	2	0	0
RAYLEIGH	47	47	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	2	0	2
PROBA-V_L1B_CALIBRATION	261	215	43
PROBA-V_L1B_INTERSECTION	770	414	356
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. Please note that reporting is done for "collection 1" ICP files.

A reanalysis of the degradation trends since start of the operational phase for the various spectral bands and cameras have been performed based on the calibration results obtained on the basis of the OSCAR Libya-4 desert calibration, calibration over DCC and the lunar calibration (only for CENTER camera). For LEFT and CENTER camera the coefficients of the applied degradation model are close to the linear trends calculated on the basis of the latest results. For the RIGHT camera the applied degradation model slightly overcorrects the observed trend. This overcorrection can also be seen in Figure 3. The coefficients of the degradation model for RIGHT SWIR strips will therefore be adapted.
On the other hand the degradation model for LEFT and CENTER BLUE bands seems to slightly underestimate the observed trend and therefore also needs to be adapted.

The yaw maneuver for the LEFT camera on the 21st of July was not executed as planned due to an error in the uploaded attitude files. Possible alternative opportunities will be looked for. The data of the yaw maneuvers performed on 3rd and 12th of July for CENTER and RIGHT cameras will be analyzed in the coming weeks.

Two new bad pixels (LEFT SWIR1 strip pixel 345 (0-based) and CENTER SWIR 3 pixel 99) have been found and will be included in the next update of the IPC files.

A short paper on PROBA-V radiometric calibration has been submitted for the GSICS Newsletter.

Radiometric ICP file

Both the SWIR and BLUE LEFT/CENTER absolute calibration coefficients will be updated following a linear degradation model. The linear degradation model will be adapted based on the latest trend analyses. Furthermore the dark currents will be updated and a bad pixel (LEFT SWIR1 strip pixel 345 (0-based) and CENTER SWIR 3 pixel 99) will be added.

The current ICP files are

- PROBAV_ICP_RADIOMETRIC#LEFT_20170801_V01
- PROBAV_ICP_RADIOMETRIC#CENTER_20170801_V01
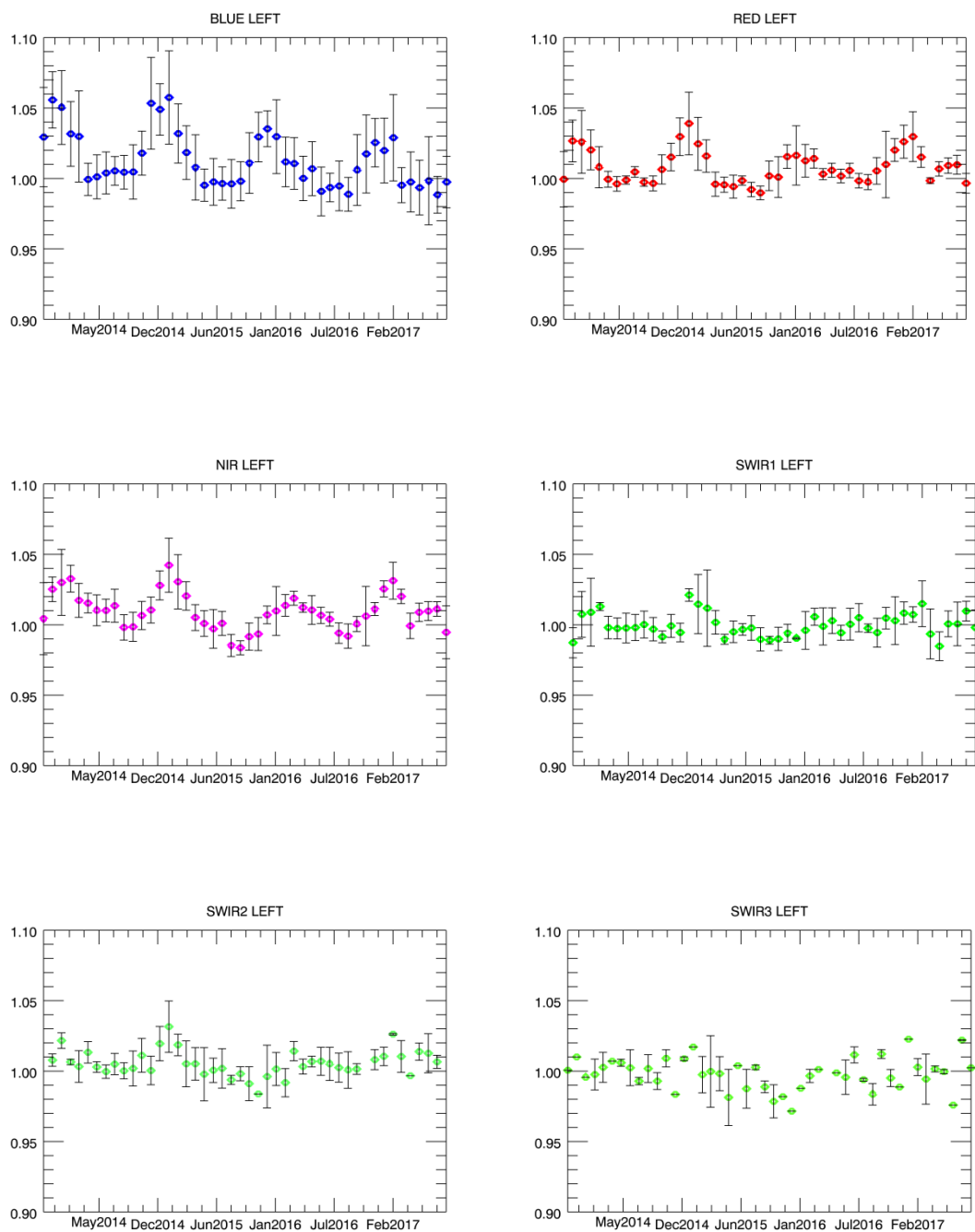- PROBAV_ICP_RADIOMETRIC#RIGHT_20170801_V01

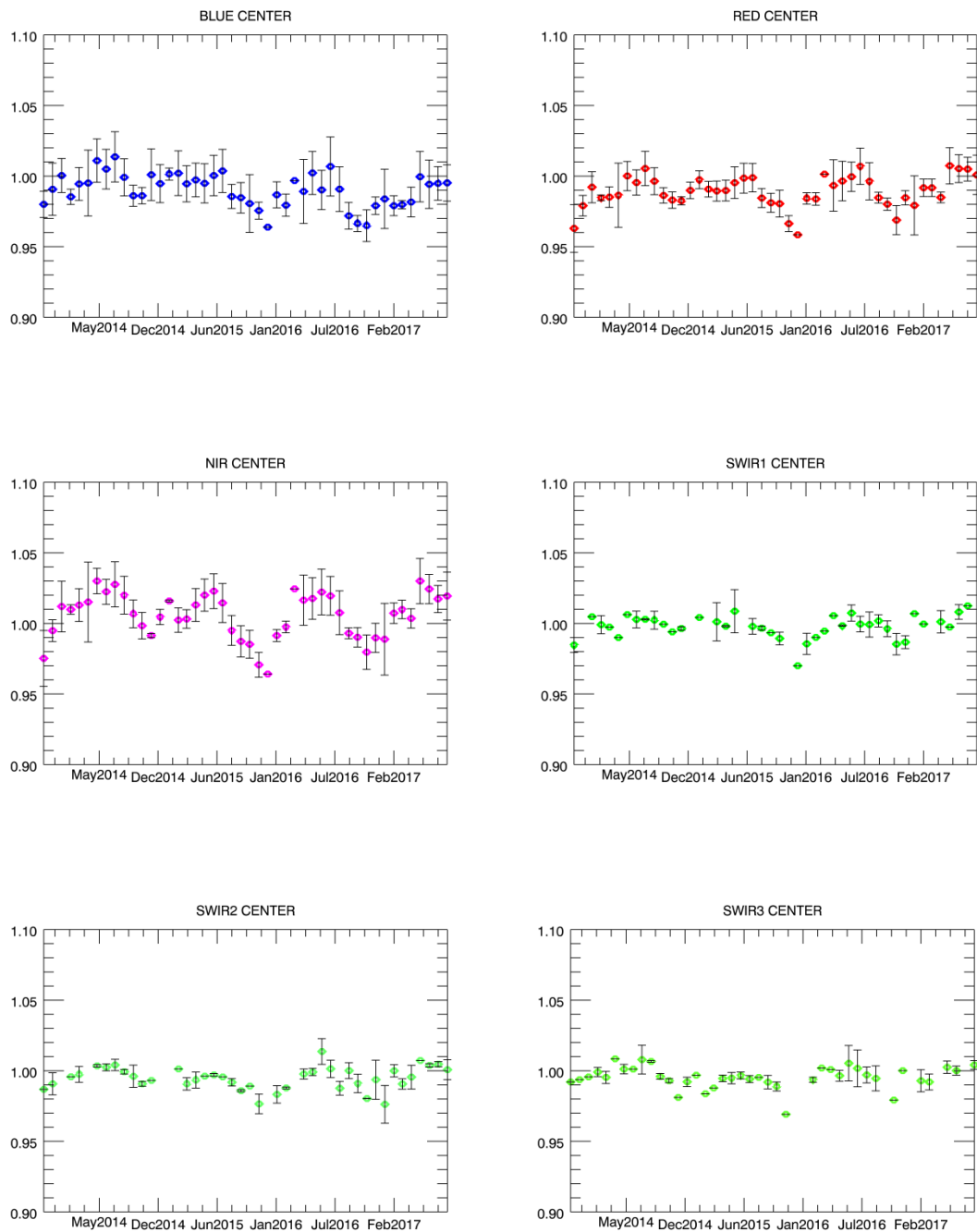*Figure 1. Libya-4 desert calibration results: LEFT monthly averaged results (collection 1)*

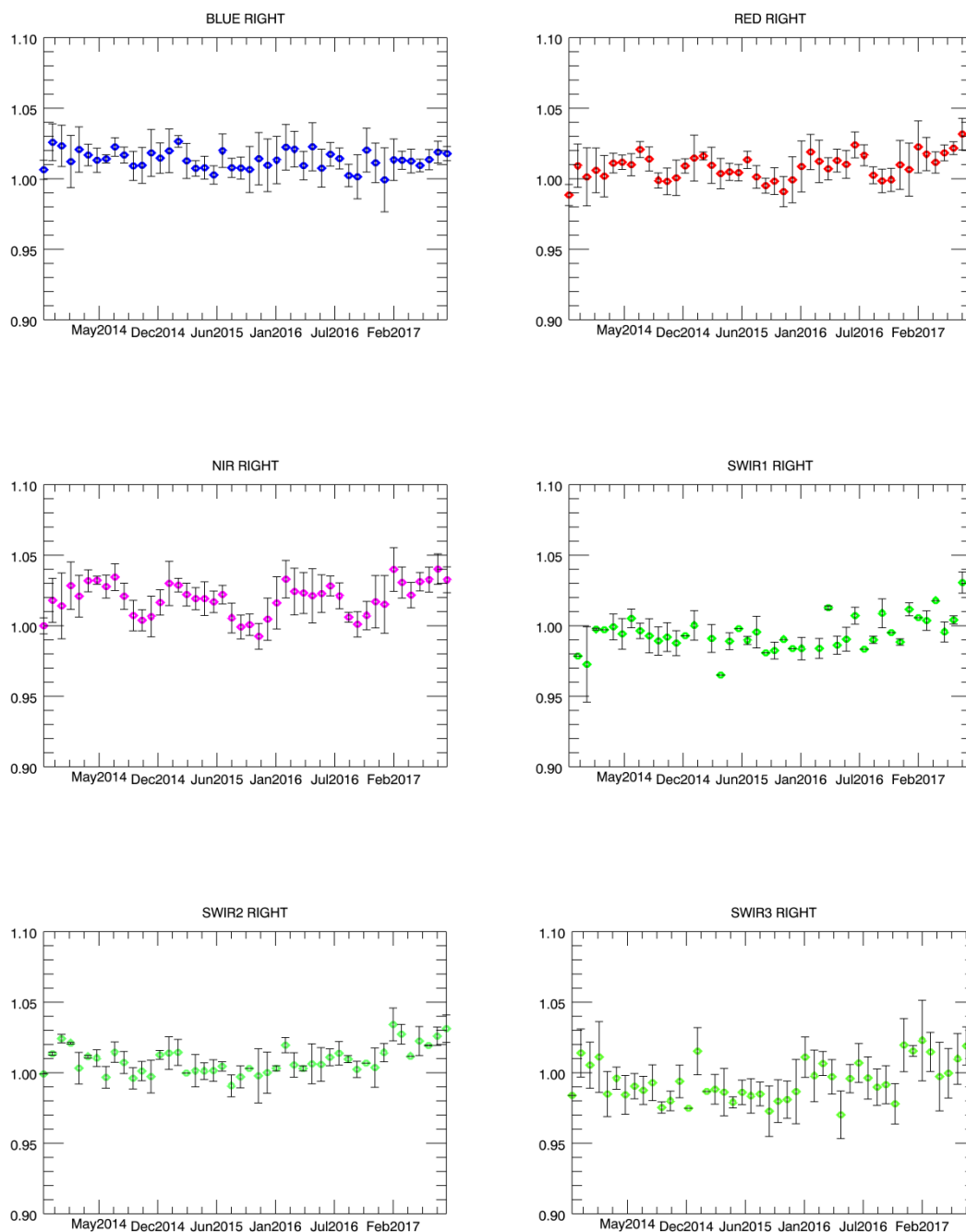Figure 2. Libya-4 desert calibration results: CENTER monthly averaged results (collection 1)

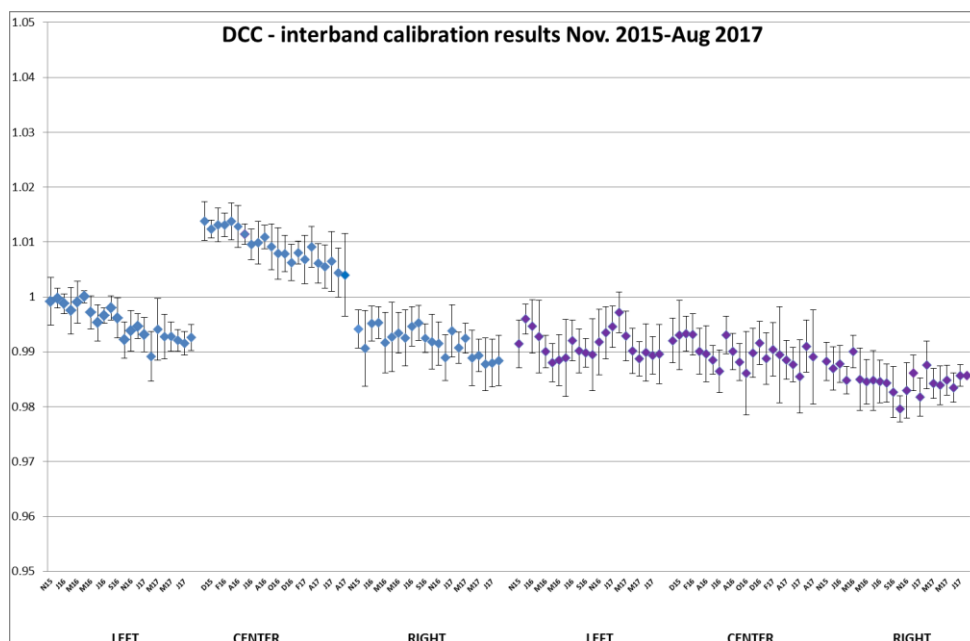*Figure 3. Libya-4 desert calibration results: RIGHT monthly averaged results (collection 1)*

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	14094	14094	0

Table13: Processed calibration images for this reporting period

Geometric ICP file

During previous month, the average ALE was < 83 m (σ < 92 m). Daily values peaked at 25/7 (101 – 118 m, SWIR – BLUE), and 05/8 (92 – 104 m, SWIR – BLUE).
The daily ALE evolution is shown in Figure 5.

The geometric accuracy was within the requirement of < 300 m, with an average compliance of 99.10% (98.63 – 99.75% from BLUE to SWIR).
The usual compliance minima synchronous with the ALE maxima occurred, with the lowest compliance values at 25/7 (97.27 – 98.07% from BLUE to SWIR).

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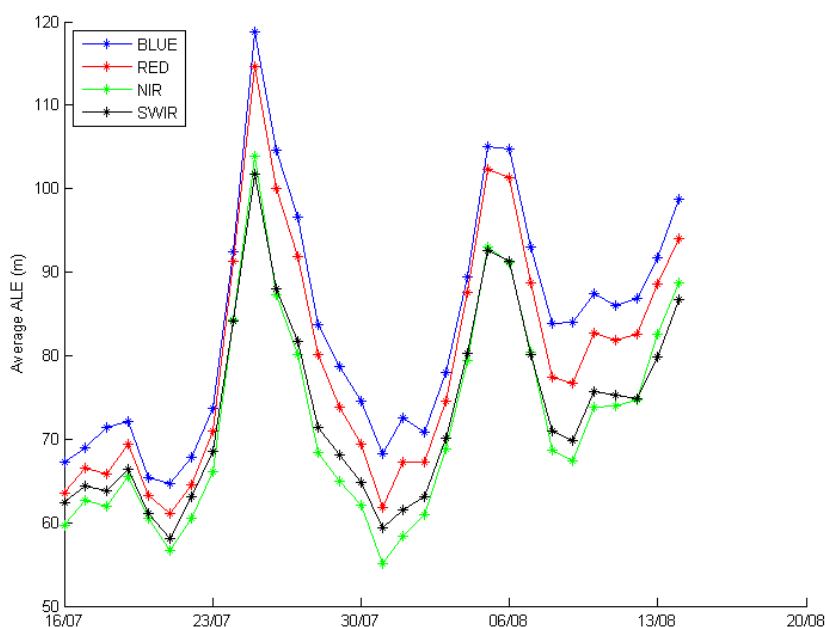- PROBAV_ICP_GEOMETRIC#RIGHT_20160907_V01

Figure 5: Daily ALE evolution for all PROBA-V spectral bands for 16/7/2017 – 15/8/2017.

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
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	Open	16/09/2016	Software
PROBAVUS-66	Cloud cover percentages on PDF products are not reliable	Open	19/10/2016	PDF
PROBAVUS-68	ICP file version not taken into account when processing	Open	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

0 new issues were logged during this reporting period
0 issue(s) was resolved and closed during this reporting period
0 issues are resolved but remain to be closed formally
0 issues are resolved but remain in the list logging purposes
0 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 km² (missing TFF))	0	
Large Gaps (< 21600 km²)	3	18/07, 17/07, 10/08
Medium Gaps (< 10000 km²)	4	12/08, 19/07, 21/07, 15/08
Minor Gaps (< 3600 km²)	3	06/08, 29/07, 31/07
Negligible Gaps (< 1000 km²)	18	25/07, 20/07, 09/08, 30/07, 14/08, 04/08, 03/08, 08/08, 02/08, 23/07, 07/08, 11/08, 27/07, 01/08, 22/07, 05/08, 26/07, 16/07
Complete synthesis (no gaps)	3	24/08, 13/08, 28/07

Table14: Overview of S1 for this reporting period

Synthesis	Missing	Decom. Error	Geom. Error	Missing TFF	Autom. Recovery	VC4 Missing	Create Contours	Other
20170716	0.00%		2					
20170717	5.08%	2	2					1
20170718	8.07%	2	4					2
20170719	0.81%	1						1
20170720	0.01%	2						
20170721	4.69%		3					2
20170722	0.25%	1						
20170723	0.26%	3	3					
20170724	0.00%							1
20170725	0.01%	1	1					
20170726	0.08%	1	7					
20170727	0.24%		6					
20170728	0.00%							
20170729	2.84%	5	11		1			1
20170730	0.03%	3	2					
20170731	1.32%	2	5		1		1	
20170801	0.00%	1						
20170802	0.01%		3					
20170803	0.01%	2						
20170804	0.02%	2	2					
20170805	0.29%	2	2					
20170806	1.26%	3	1			1		
20170807	0.01%	2						
20170808	0.01%		1					
20170809	0.37%	2						
20170810	9.43%	7	5	1				
20170811	0.01%	2						
20170812	2.36%	3	4		1		1	
20170813	0.00%							
20170814	0.46%		10					
20170815	4.83%	3	10	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 developments are planned

- No other activities scheduled.

7. Operational remarks

The yaw maneuver for the LEFT camera on the 21st of July was not executed as planned due to an error in the uploaded attitude files. Possible alternative opportunities will be looked for.

On July 24 2017, VITO experienced a power interruption on the 100M processing rack; this caused a small delay in the delivery of the 100M data for that day.