



MONTHLY OPERATIONS REPORT

MOR#49

Reporting period from 16-Dec-2017 to 15-Jan-2018

Reference: *PROBA-V_D5_MOR-49_01_v1.0*

Author(s): Lieve Van den Heuvel, Sindy Sterckx, Jan Vanhout, Erwin Wolters

Version: 1.0

Date: 17/01/2018

DOCUMENT CONTROL

Signatures

Author(s) Lieve Van den Heuvel, Sindy Sterckx, Jan Vanhout, Erwin Wolters

Reviewer(s) Erwin Wolters

Approver(s) Dennis Clarijs

Issuing authority

Change record

Release	Date	Pages	Description	Editor(s)/Reviewer(s)
1.0	17/01/2018	All	Initial version	



TABLE OF CONTENT

1. Summary.....	4
2. System Infrastructure.....	4
3. Image Processing Services	5
3.1. Ingested and archived products	5
3.2. Generated and archived products	5
3.3. Backup and archiving service	6
3.4. Dissemination service	7
3.5. End-user activity	8
4. Image Calibration services.....	11
4.1. Radiometric Calibration	11
4.2. Geometric Calibration	11
5. Anomalies	17
5.1. System related issues	17
5.2. Image processing issues	18
6. Scheduled activities for the next period(s)	20
7. Operational remarks	20

1. Summary

In this reporting period, the majority of the 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. No transfer frame files were missing this month, only some missing VC4 data.

On January 6 2018, some non-critical servers were down for a short period of time due to planned electrical works. No data was impacted and data was delivered on schedule.

Acquisitions of the Antarctica continent have started since October 24, 2017 and will run until end of February 2018. A separate workflow is being set up to process the acquired segment using a new DEM and another projection. All data will be post-processed to L2A data and distributed to the user community end of January/early February 2018 onwards.

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

A new release of the Product Distribution Platform is currently being tested. This release will bring an upgrade to used libraries bringing the platform to the latest IT-standards. Release is expected in February 2018.

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	99.89	0.11 ^(*)
PDF	100.0	0.0

Table 1: System Infrastructure availability for this reporting period

(*) Due to a planned power interruption on Saturday 6/01/2017, some non-critical servers were offline for a few hours.

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	310	0	310

Table 2: Ingested and archived products for this reporting period

3.2. Generated and archived products

Product Type	Total	Processed	Error ^(*)	Archived
PROBAV_L1A - Calibration	1256	1252	4	1256
PROBAV_L1A - Nominal	2579	2573	6	2579
PROBAV_L1C	2573	2573	0	2573
PROBAV_L2A_100M	888	888	0	888
PROBAV_L2A_300M	2573	2573	0	2573
PROBAV_L2A_1KM	2573	2573	0	2573
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

(*) 10 x L1A errors due to geometric processing

3.3. Backup and archiving service

Product type	Total Files	Total File Size (GB)
TFF	297	832.6
L1A	3612	1643.62
Database transaction logs	1067	884.37
Database incremental back-up	40	9.61
Database full back-up	5	183.1

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

Product type	Total Files	Total File Size (GB)
PROBAV_TRANSFERFRAMES	311	956.11
PROBAV_L1A	3832	1825.46
PROBAV_L1C	2571	2771.89
PROBAV_L2A_100M	3318	2717.25
PROBAV_L2A_300M	10127	1557.49
PROBAV_L2A_1KM	9065	174.45
PROBAV_L3_S1_TOA_100M	151	3967.48
PROBAV_L3_S1_TOC_100M	152	3773.51
PROBAV_L3_S1_TOC_NDVI_100M	143	407.57
PROBAV_L3_S5_TOA_100M	27	2672.44
PROBAV_L3_S5_TOC_100M	31	2993.01
PROBAV_L3_S5_TOC_NDVI_100M	29	324.65
PROBAV_L3_S1_TOA_300M	154	1863.21
PROBAV_L3_S1_TOC_300M	152	1774.00
PROBAV_L3_S10_TOC_300M	12	219.56
PROBAV_L3_S10_TOC_NDVI_300M	13	21.67
PROBAV_L3_S1_TOA_1KM	146	225.15
PROBAV_L3_S1_TOC_1KM	151	226.79
PROBAV_L3_S10_TOC_1KM	13	31.81
PROBAV_L3_S10_TOC_NDVI_1KM	13	2.61
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	2571	180	183
PROBAV_L2A_100M	883	8	8
PROBAV_L2A_300M	2579	32	34
PROBAV_L2A_1KM	2579	0	4
PROBAV_L3_S1_TOA_100M	31	1144	1105
PROBAV_L3_S1_TOC_100M	31	1628	4221
PROBAV_L3_S1_TOC_NDVI_100M	31	2269	2220
PROBAV_L3_S5_TOA_100M	6	37	60
PROBAV_L3_S5_TOC_100M	6	30	232
PROBAV_L3_S5_TOC_NDVI_100M	6	462	858
PROBAV_L3_S1_TOA_300M	31	141	142
PROBAV_L3_S1_TOC_300M	31	1165	1190
PROBAV_L3_S10_TOC_300M	3	32	35
PROBAV_L3_S10_TOC_NDVI_300M	3	327	335
PROBAV_L3_S1_TOA_1KM	31	110	114
PROBAV_L3_S1_TOC_1KM	31	172	215
PROBAV_L3_S10_TOC_1KM	3	31	37
PROBAV_L3_S10_TOC_NDVI_1KM	3	29	41

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 **1320** with **114** different nationalities representing **987** different companies/universities.

Product type	Africa	Asia	Europe	N-America	Oceania	S-America
PROBAV_L1C	0	370.10	96.35	1.31	0	0
PROBAV_L2A_100M	0	12.64	0	1.60	0	0
PROBAV_L2A_300M	0	0.02	0	0	0	0
PROBAV_L2A_1KM	0	0	0.16	0	0	0
PROBAV_L3_S1_TOA_100M	0	335.68	3.24	0	0.10	0
PROBAV_L3_S1_TOC_100M	0.01	859.66	21476.56	503.25	0	0.05
PROBAV_L3_S1_TOC_NDVI_100M	0	41.59	0.11	0	0	0
PROBAV_L3_S5_TOA_100M	0	8.98	463.89	0	0	0.01
PROBAV_L3_S5_TOC_100M	18.34	0.00	445.42	0	0	0
PROBAV_L3_S5_TOC_NDVI_100M	0	1353.19	8.12	0	0	10.41
PROBAV_L3_S1_TOA_300M	0	2.50	888.78	0	0	0
PROBAV_L3_S1_TOC_300M	0	2.02	819.47	262.50	0	0
PROBAV_L3_S10_TOC_300M	2.04	1.31	156.07	0	0	0
PROBAV_L3_S10_TOC_NDVI_300M	0	0.30	3.47	0	0	0.06
PROBAV_L3_S1_TOA_1KM	0	0	131.22	0	0	0
PROBAV_L3_S1_TOC_1KM	0.00	0	212.07	0	0	0
PROBAV_L3_S10_TOC_1KM	3.03	0.03	15.67	0.51	0	0
PROBAV_L3_S10_TOC_NDVI_1KM	0.38	0.20	1.34	0	0	0.01

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

Product Type	Global
L1C	467.75
PROBAV_L2A_100M	14.24
PROBAV_L2A_300M	0.02
PROBAV_L2A_1KM	0.16
PROBAV_L3_S1_TOA_100M	339.02
PROBAV_L3_S1_TOC_100M	22839.53
PROBAV_L3_S1_TOC_NDVI_100M	41.70
PROBAV_L3_S5_TOA_100M	472.88
PROBAV_L3_S5_TOC_100M	463.76
PROBAV_L3_S5_TOC_NDVI_100M	1371.72
PROBAV_L3_S1_TOA_300M	891.29



PROBAV_L3_S1_TOC_300M	1083.99
PROBAV_L3_S10_TOC_300M	159.41
PROBAV_L3_S10_TOC_NDVI_300M	3.84
PROBAV_L3_S1_TOA_1KM	131.22
PROBAV_L3_S1_TOC_1KM	212.07
PROBAV_L3_S10_TOC_1KM	19.23
PROBAV_L3_S10_TOC_NDVI_1KM	1.93

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

Company	# Downloads
CSIR-IHBT	2252
GSI LTD	1612
VISIOTERRA	1590
UCLouvain	1077
IRRI	1064
RADI	1050
VITO	566
ULG	324
666	207
UNIVERSIDADE DE LISBOA	166

Table 9: Top 10 user companies for the reporting period

Country	# Users
CHINA	129
BELGIUM	108
FRANCE	63
ITALY	62
UNITED STATES	60
BRAZIL	58
INDIA	55
UNITED KINGDOM	49
GERMANY	47
NETHERLANDS	46

Table 10: Top 10 countries with most registered users

List of issues raised by users:

no space left on device
Problem with RStudio in MEP
PDF: PROBA-V 100 M syntheses (older than 1 month) - S1 TOC 100 m [C1] - Sunil Kumar -
2018/1/8 - downloading of data
inquiry about PROBA-V image
PROBA MEP VM - NFS directory
VGT-P Datapool error(s)
how can I get SPOT-NDVI from VITO
RITM0035681 - HD-DC Proba-V Image of the week - Lake Chany, Russia
2 vraagjes ...
sklearn library in Python3.5
Free calendar
FTP access
File copy

4. Image Calibration services

4.1. Radiometric Calibration

Calibration request type	Total	Processed	Not received	Error
CLOUDS	20	16	4	0
DARK CURRENT	25	20	5	0
MOON	2	2	0	0
RAYLEIGH	56	47	9	0
SNOW	448	337	111	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	1250	1207	43
PROBA-V_L1B_INTERSECTION	819	182	637
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.

As the calibration results for the SWIR strips of the RIGHT camera continues to show an overcorrection of the degradation, it is decided to no longer apply the degradation model for these strips.

For the LEFT and CENTER blue strips calibration results are relatively stable over the recent months and therefore the applied degradation model is assumed to be still valid.

No new bad pixels were identified in the recent month.

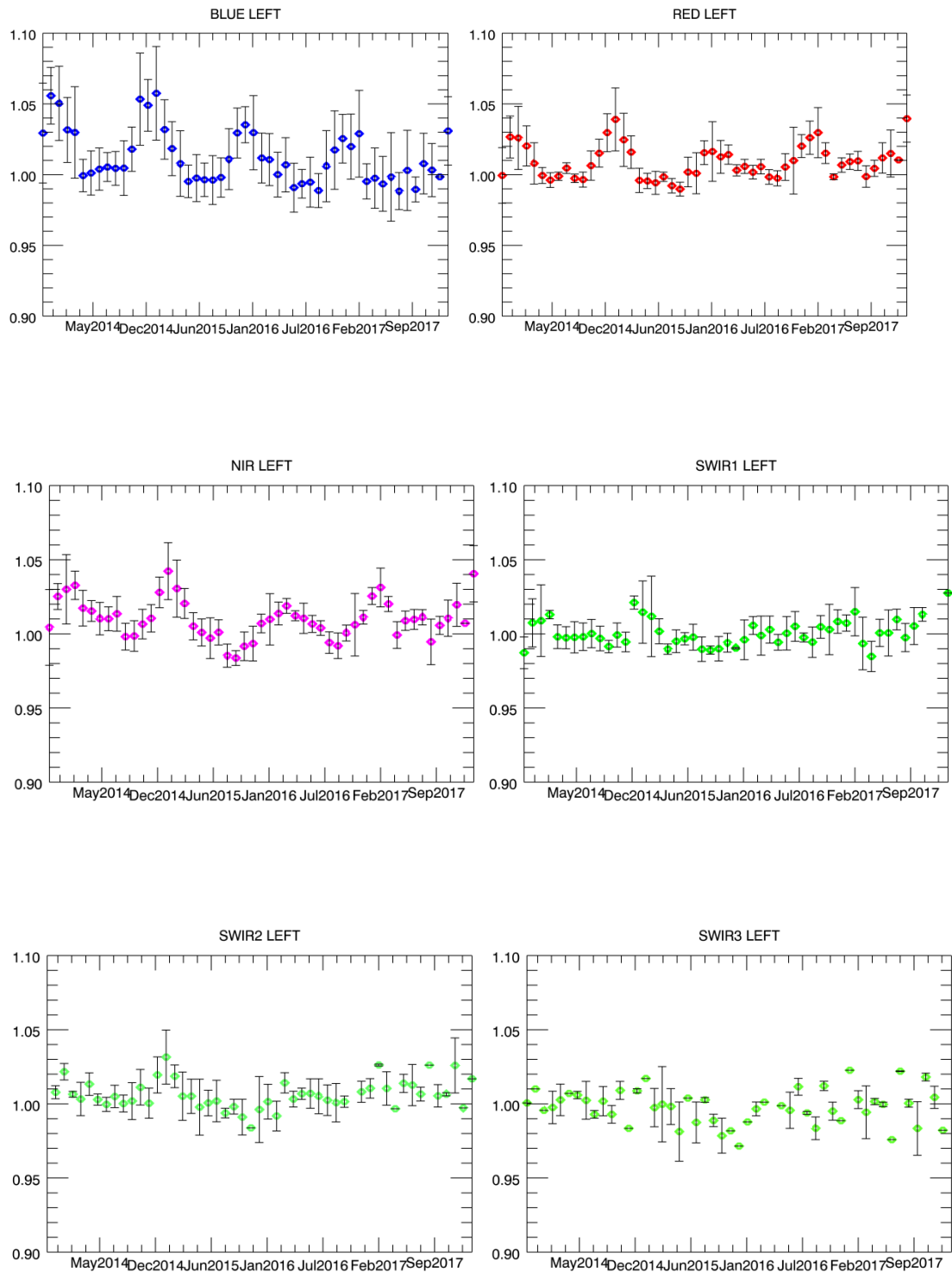


Figure 1. Libya-4 desert calibration results: LEFT monthly averaged results (collection 1)

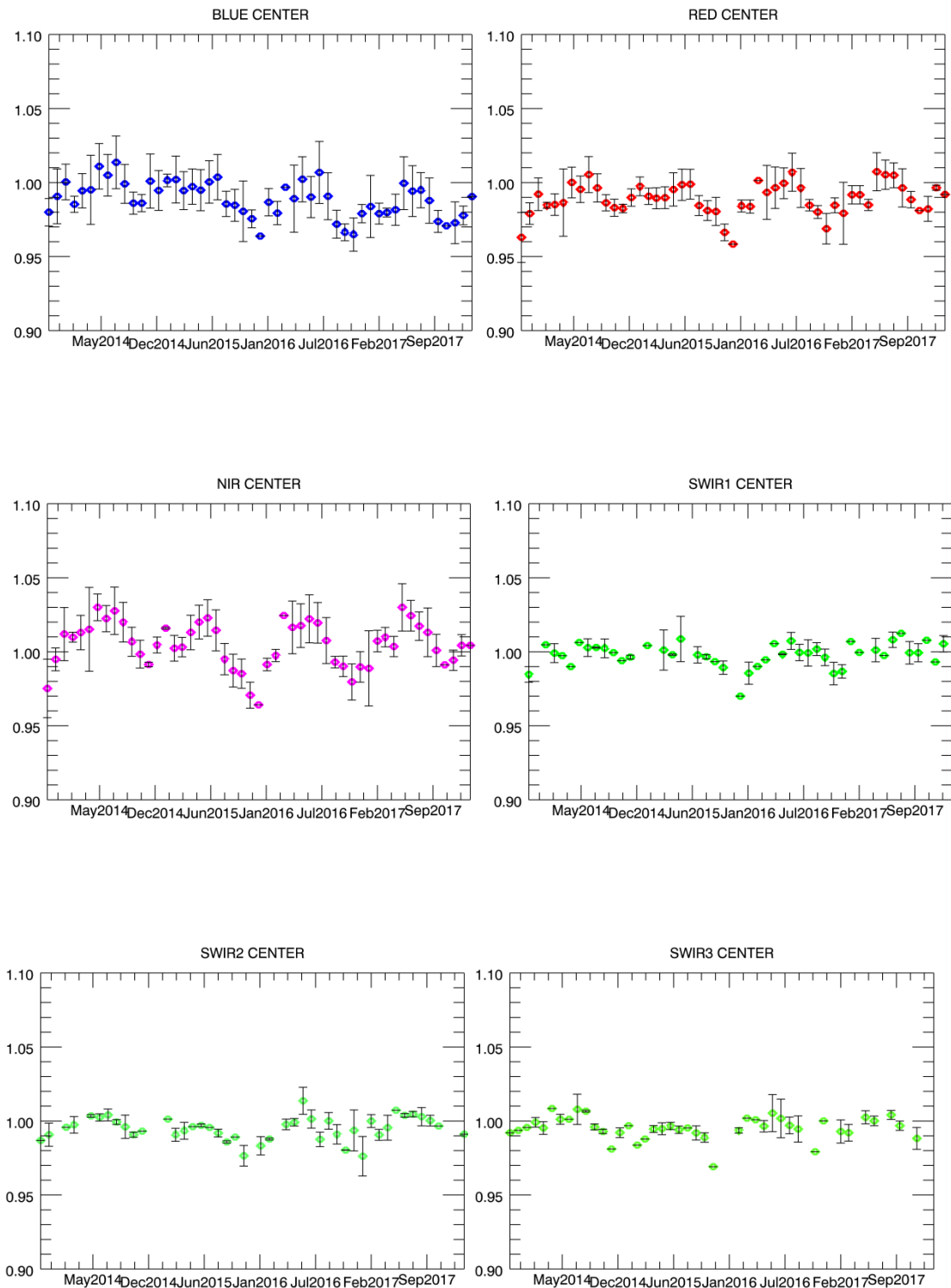


Figure 2. Libya-4 desert calibration results: CENTER monthly averaged results (collection 1)

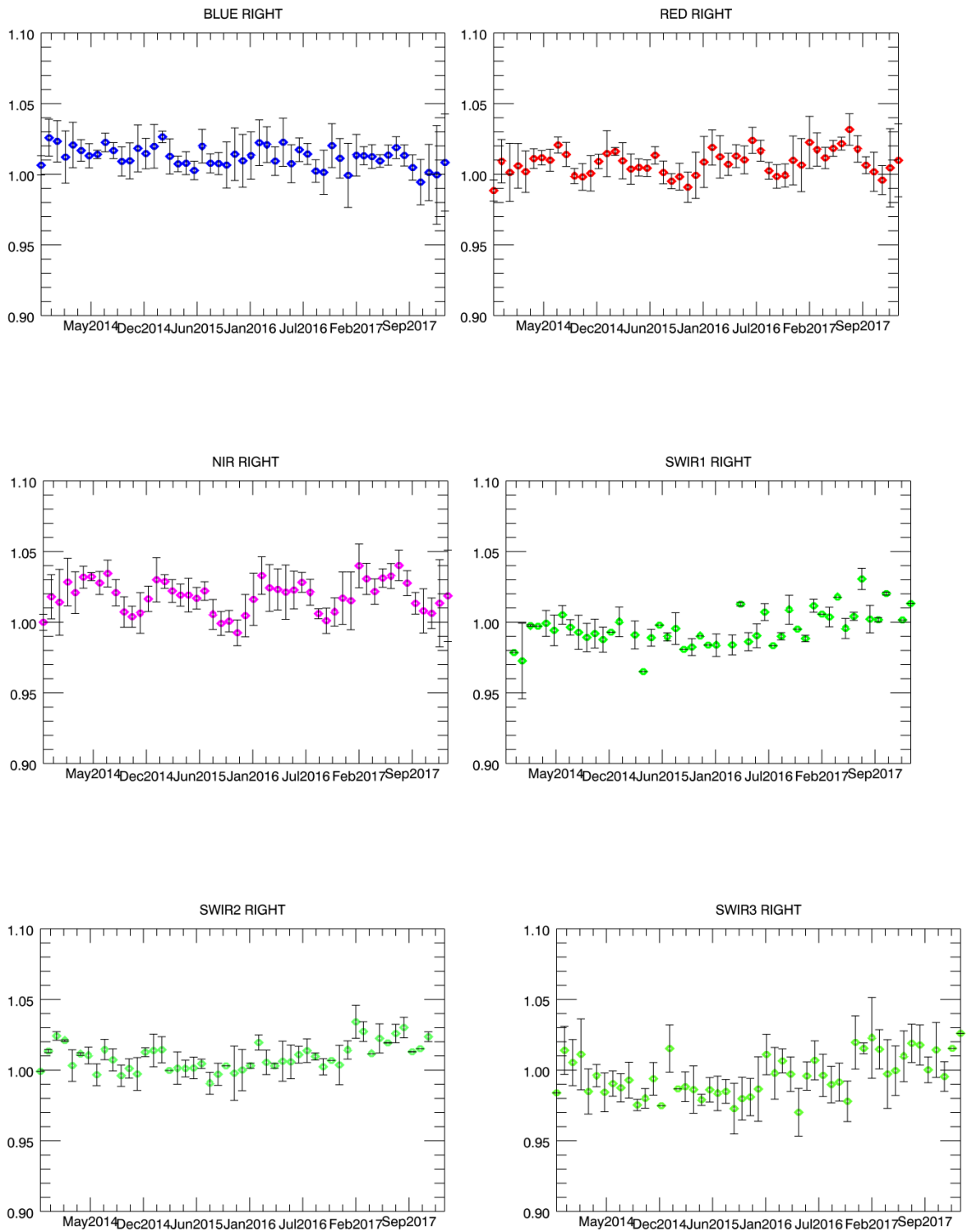


Figure 3. Libya-4 desert calibration results: RIGHT monthly averaged results (collection 1)

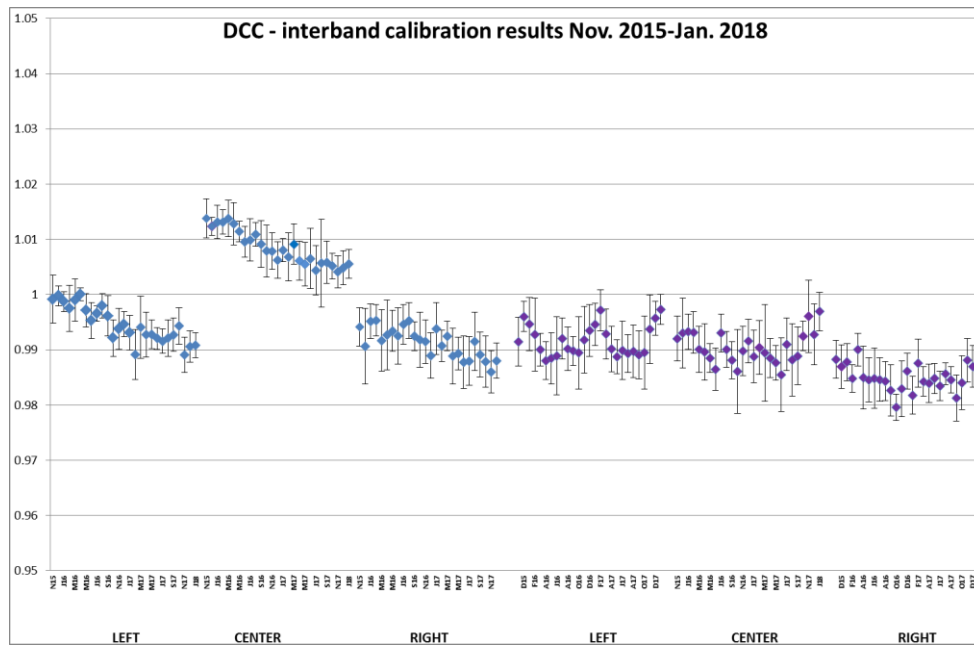


Figure 4. DCC inter-band calibration results: LEFT, CENTER and RIGHT camera (collection 1)

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_20180101_V01
 - PROBAV_ICP_RADIOMETRIC#CENTER_20180101_V01
- PROBAV_ICP_RADIOMETRIC#RIGHT_20180101_V01

4.2. Geometric Calibration

Calibration image type	Total	Processed	Error
PROBA-V_L1C_INTERSECTION	13389	13389	0

Table13: Processed calibration images for this reporting period

During the period 16/12/2017 – 15/1/2018, the average ALE was < 78 m ($\sigma < 94$ m). The daily ALE evolution (see Figure 5) shows a minor peak period during 23 – 26/12/2017, with values being generally 70 – 85 m. From 7/1/2018 onwards, a sharp increase to a maximum with values of 110 – 127 m on 9/1/2018 occurred, followed by a steep decline towards 60 – 70 m at the end of the reporting period.

The geometric accuracy was within the requirement of < 300 m, with an average compliance for all cameras of 99.28% (98.77 – 99.72% from BLUE to SWIR). Daily values showed the normal minima synchronous with the ALE maxima, with the lowest compliance values of 97.4 – 99.7 (BLUE to SWIR) on 9/1/2018.

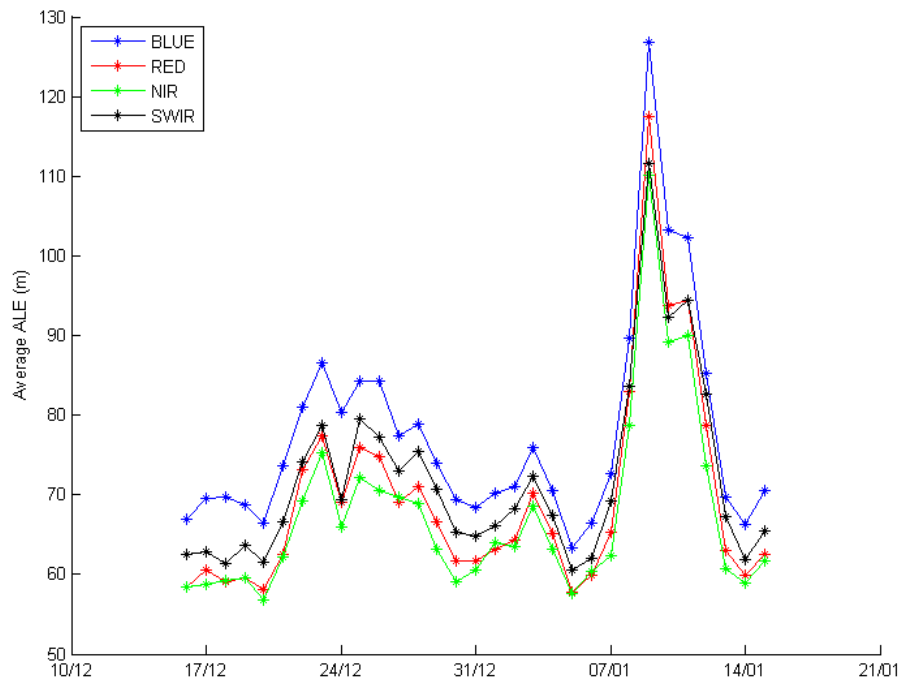


Figure 5 - Daily ALE evolution for all PROBA-V spectral bands

Geometric ICP file

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

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
- 1 issue is resolved but remain to be closed formally
- 1 issue is 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 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)	0	
Medium Gaps (< 10000 km²)	2	12/01, 06/01
Minor Gaps (< 3600 km²)	6	23/12, 15/01, 08/01, 24/12, 01/01, 17/12
Negligible Gaps (< 1000 km²)	23	04/01, 09/01, 14/01, 30/12, 25/12, 20/12, 10/01, 05/01, 21/12, 31/12, 26/12, 16/12, 11/01, 27/12, 22/12, 02/01, 07/01, 28/12, 18/12, 13/01, 19/12, 03/01, 29/12
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
20171216	0.29%	3	31			1		
20171217	2.03%	4	24		1			
20171218	0.90%	3	33					1
20171219	0.34%	5	22		1			
20171220	0.06%	1	10					1
20171221	0.47%		24					
20171222	0.15%	3	17					
20171223	1.37%	2	20		1			
20171224	1.07%	3	20		1		1	
20171225	0.29%	4	28					1
20171226	0.37%	1	31					
20171227	1.23%		23					
20171228	0.89%	1	22					
20171229	0.18%	3	17					
20171230	0.19%	2	19					
20171231	0.13%	1	16					
20180101	3.87%	7	7			1	1	
20180102	0.03%	1	6					
20180103	0.03%		4					
20180104	0.07%		11					
20180105	1.58%	1	20				2	
20180106	9.31%	4	22			1		
20180107	0.26%		32					
20180108	3.74%	3	35			1		
20180109	0.22%	3	21					
20180110	0.60%		17				1	
20180111	1.02%		22					
20180112	4.58%	4	25		1			
20180113	0.66%	3	15					
20180114	1.50%		20					
20180115	1.37%	3	16		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:
An upgrade of the EJB libraries of the Product Distribution Platform is currently under test. This should bring the platform up to today's security standards and technology. After being deployed, the platform can go from http to https.
- No other activities scheduled.

7. Operational remarks

The Antarctica continent is being imaged from October 24, 2017 to end of February 2018. Due to processing restrictions in the nominal workflow, the segments that were acquisitioned for this ROI need to be processed in a separate environment. This is currently being deployed and tested. The segments will be processed using a new DEM (GTOP030) and another projection (Stereographic polar projection) and will be processed up until L2A data for distribution to the user community. Idea is to start distributing the acquired segment from end of January/early February 2018 onwards.