



MONTHLY OPERATIONS REPORT

MOR#034

Reporting period from 16-Sep-2016 to 15-Oct-2016

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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	7
4. Image Calibration services.....	10
4.1. Radiometric Calibration	10
4.2. Geometric Calibration	15
5. Anomalies	16
5.1. System related issues	16
5.2. Image processing issues	17
6. Scheduled activities for the next period(s)	18
7. Operational remarks	18

1. Summary

In this reporting period, the majority of the synthesis products were complete. Anomalies impacting the incomplete products were automatic recoveries of the platform, some geometric instabilities and a low rate of decompression errors. One transfer frame files was missing due to an automatic recovery of the platform during an X-band pass.

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

Reprocessing of the PROBA-V archive is running smoothly at the moment. Currently, data of little over one year of data has been reprocessed and is in progress of internal validation. Reprocessed products and implementation in NRT processing will be done after validation of a longer time series, currently projected for the November timeframe.

In an agreement with ESA, it was decided to seize the generation and distribution of the PV weekly operation reports as from 11/10/2016. Instead, an overview of the daily anomalies has been added in section 5.2 of this monthly report.

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 ^(*)	299

Table 2: Ingested and archived products for this reporting period

(*) Missing TFF 11206: Due to an automatic recovery of the platform during an X-band pass. No actual data was found lost.

3.2. Generated and archived products

Product Type	Total	Processed	Error	Archived
PROBAV_L1A - Calibration	276	276	0	276
PROBAV_L1A - Nominal	2584	2578	6 ^(*)	2584
PROBAV_L1C	2578	2578	0	2578
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

(*) 6 x L1A errors: Geometric Processing

3.3. Backup and archiving service

Product type	Total Files	Total File Size (GB)
TFF	294	785.19
L1A	2794	1398.78
Database transaction logs	2481	614.98
Database incremental back-up	160	151.05
Database full back-up	17	574.95

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

Product type	Total Files	Total File Size (GB)
PROBAV_TRANSFERFRAMES	1459	4044.06
PROBAV_L1A	2744	1480.56
PROBAV_L1C	2143	2484.83
PROBAV_L3_S1_TOA_100M	298	8597.71
PROBAV_L3_S1_TOC_100M	315	9471.35
PROBAV_L3_S1_TOC_NDVI_100M	253	879.60
PROBAV_L3_S5_TOA_100M	39	3969.11
PROBAV_L3_S5_TOC_100M	39	4121.43
PROBAV_L3_S5_TOC_NDVI_100M	26	319.89
PROBAV_L3_S1_TOA_300M	269	3136.56
PROBAV_L3_S1_TOC_300M	272	3290.05
PROBAV_L3_S10_TOC_300M	29	594.47
PROBAV_L3_S10_TOC_NDVI_300M	27	47.55
PROBAV_L3_S1_TOA_1KM	272	431.78
PROBAV_L3_S1_TOC_1KM	268	437.51
PROBAV_L3_S10_TOC_1KM	29	79.74
PROBAV_L3_S10_TOC_NDVI_1KM	29	6.28
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	200	0.25
METEO_METEOSERVICES	200	1.07
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	2576	119	211
PROBAV_L3_S1_TOA_100M	30	296	372
PROBAV_L3_S1_TOC_100M	30	1766	1700
PROBAV_L3_S1_TOC_NDVI_100M	30	29	30
PROBAV_L3_S5_TOA_100M	6	20	21
PROBAV_L3_S5_TOC_100M	6	1099	990
PROBAV_L3_S5_TOC_NDVI_100M	6	286	378
PROBAV_L3_S1_TOA_300M	30	201	195
PROBAV_L3_S1_TOC_300M	30	1417	1640
PROBAV_L3_S10_TOC_300M	3	370	491
PROBAV_L3_S10_TOC_NDVI_300M	3	197	247
PROBAV_L3_S1_TOA_1KM	30	198	206
PROBAV_L3_S1_TOC_1KM	30	1323	1284
PROBAV_L3_S10_TOC_1KM	3	129	123
PROBAV_L3_S10_TOC_NDVI_1KM	3	149	159

Table 6: Ordered and delivered products for this reporting period

3.5. End-user activity

38 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 **970** with **102** different nationalities representing **741** different companies/universities.

Product type	Africa	Asia	Europe	N-America	Oceania	S-America
PROBAV_L1C	0	17.41	431.17	0	0	0
PROBAV_L3_S1_TOA_100M	0	0.12	57.32	0	0	0
PROBAV_L3_S1_TOC_100M	0.17	724.50	20749.76	630.42	0	37.89
PROBAV_L3_S1_TOC_NDVI_100M	0.00	0.02	0.05	0	0	0.02
PROBAV_L3_S5_TOA_100M	0.29	0.30	0.05	0	0	0.01
PROBAV_L3_S5_TOC_100M	20.30	55.30	665.26	0.63	4.70	109.45
PROBAV_L3_S5_TOC_NDVI_100M	2.06	474.83	9.32	0.17	0	2.06
PROBAV_L3_S1_TOA_300M	0	2.55	1304.39	0	0	0
PROBAV_L3_S1_TOC_300M	0	13.51	1387.11	268.50	0	0
PROBAV_L3_S10_TOC_300M	2.72	4.15	232.29	0	5.65	0
PROBAV_L3_S10_TOC_NDVI_300M	0.81	5.57	2.15	0.15	5.11	0.10
PROBAV_L3_S1_TOA_1KM	0	0	230.83	0	0	0.01

PROBAV_L3_S1_TOC_1KM	0.00	0	257.96	0	0	0
PROBAV_L3_S10_TOC_1KM	0.64	0	20.64	0.85	0	0
PROBAV_L3_S10_TOC_NDVI_1KM	0.02	2.99	2.88	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	448.58
PROBAV_L3_S1_TOA_100M	57.44
PROBAV_L3_S1_TOC_100M	22142.73
PROBAV_L3_S1_TOC_NDVI_100M	0.09
PROBAV_L3_S5_TOA_100M	0.65
PROBAV_L3_S5_TOC_100M	855.65
PROBAV_L3_S5_TOC_NDVI_100M	488.45
PROBAV_L3_S1_TOA_300M	1306.94
PROBAV_L3_S1_TOC_300M	1669.12
PROBAV_L3_S10_TOC_300M	244.81
PROBAV_L3_S10_TOC_NDVI_300M	13.89
PROBAV_L3_S1_TOA_1KM	230.84
PROBAV_L3_S1_TOC_1KM	257.96
PROBAV_L3_S10_TOC_1KM	22.13
PROBAV_L3_S10_TOC_NDVI_1KM	5.91

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

Company	# Downloads
VITO	1626
ARID LAND RESEARCH CENTER	1333
GSI LTD	1272
BOKU VIENNA	900
UNIVERSITY OF CAMPINAS	363
LOCATEIT LTD	343
BEIJING FORESTRY UNIVERSITY	260
GOOGLE	246
CESBIO	178
AIRBUS	159

Table 9: Top 10 user companies for the reporting period



Country	# Users
CHINA	95
BELGIUM	88
ITALY	52
BRAZIL	44
FRANCE	43
UNITED KINGDOM	40
UNITED STATES	39
INDIA	35
NETHERLANDS	34
GERMANY	30

Table 10: Top 10 countries with most registered users

List of issues raised by users:

ProbaV:

- * product customization tool - missing gdal dll error
- * expiring orders
- * Recent data
- * username/password

4. Image Calibration services

4.1. Radiometric Calibration

Calibration request type	Total	Processed	Not received	Error
CLOUDS	15	15	0	0
DARK CURRENT	20	19	1	0
MOON	3	3	0	0
RAYLEIGH	55	55	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	3	2	1
PROBA-V_L1B_CALIBRATION	264	238	23
PROBA-V_L1B_INTERSECTION	654	457	173
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.

The calibration results for the VNIR and SWIR strips remain relatively stable. For the SWIR strips the linear degradation model is used to update monthly the absolute calibration coefficients of the different SWIR strips which explain the stable trend observed over the last months.

Radiometric ICP file

ICP dark values will be updated in the coming days and the SWIR absolute calibration coefficients will be updated following the linear degradation model.

The current ICP files are

- PROBAV_ICP_RADIOMETRIC#LEFT_20160927_V01
- PROBAV_ICP_RADIOMETRIC#CENTER_20160927_V01
- PROBAV_ICP_RADIOMETRIC#RIGHT_20160927_V01

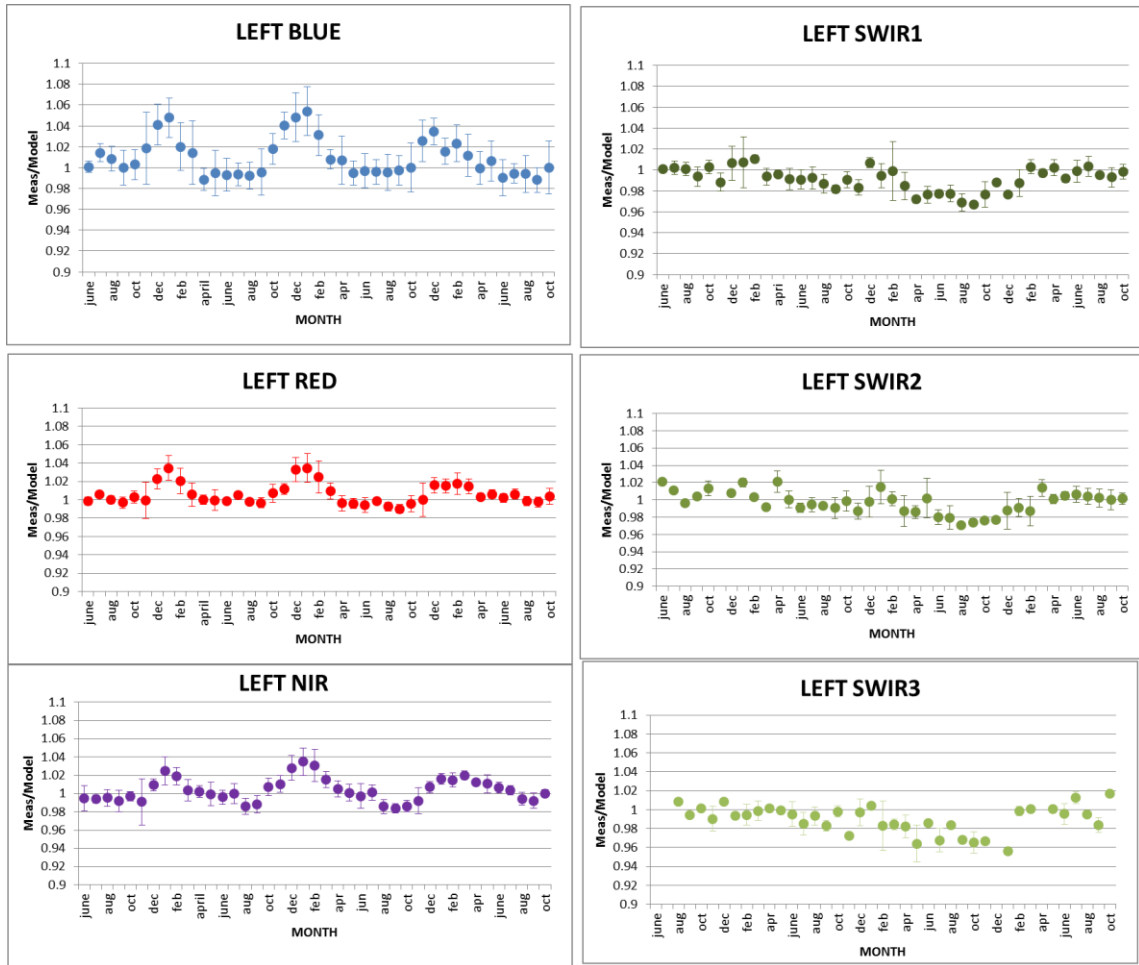


Figure 1. Libya-4 desert calibration results: LEFT monthly averaged results

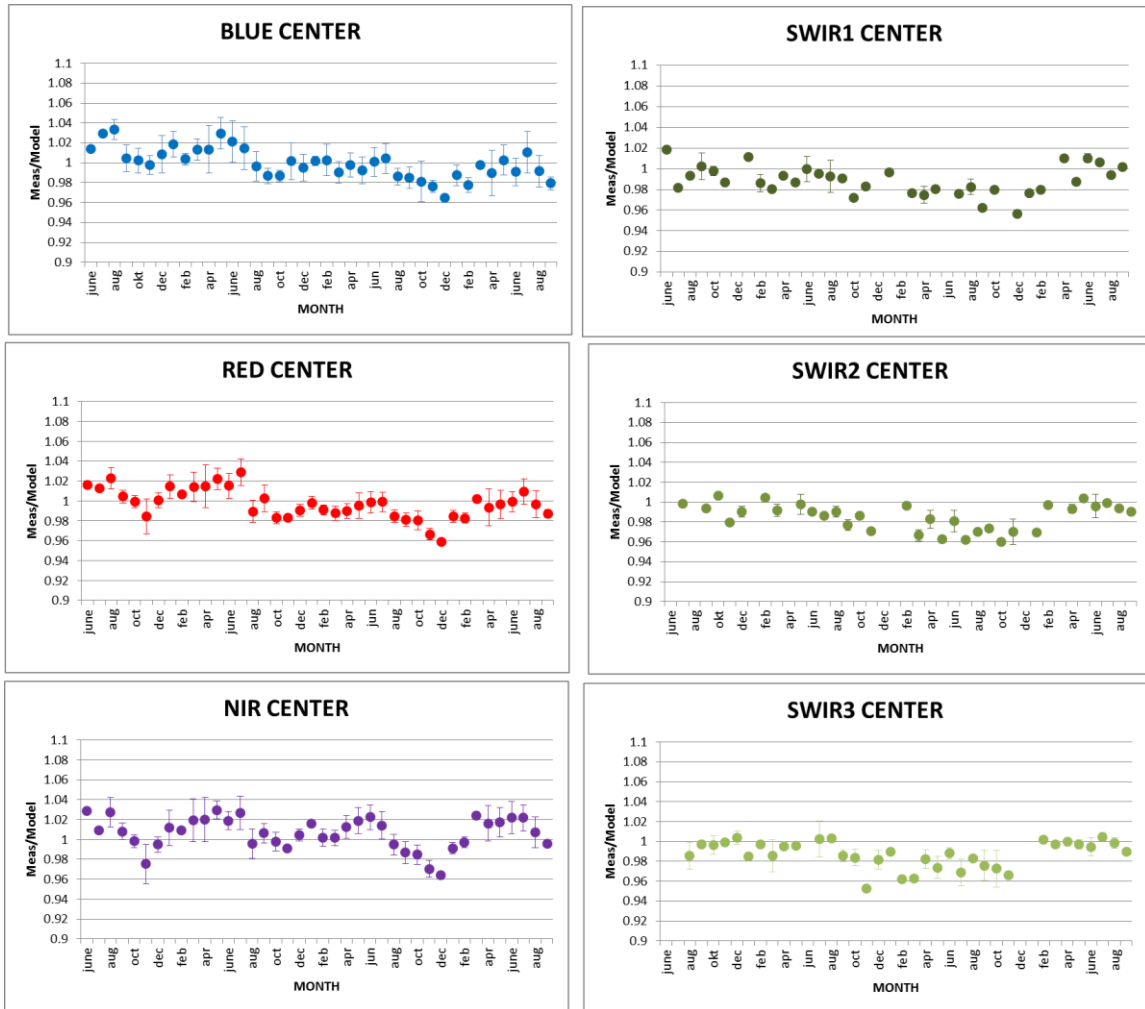


Figure 2. Libya-4 desert calibration results: CENTER monthly averaged results

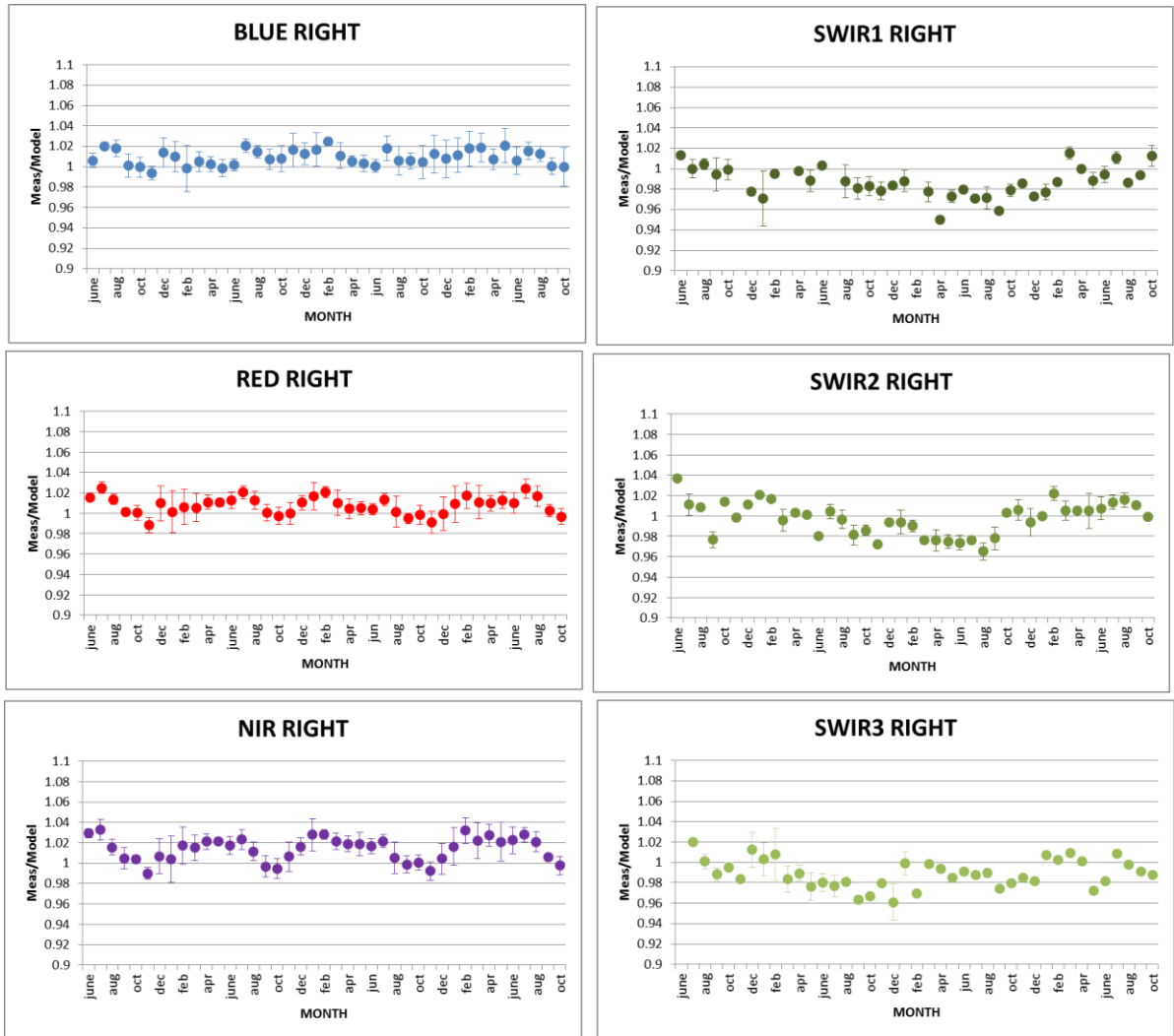


Figure 3. Libya-4 desert calibration results: RIGHT monthly averaged results

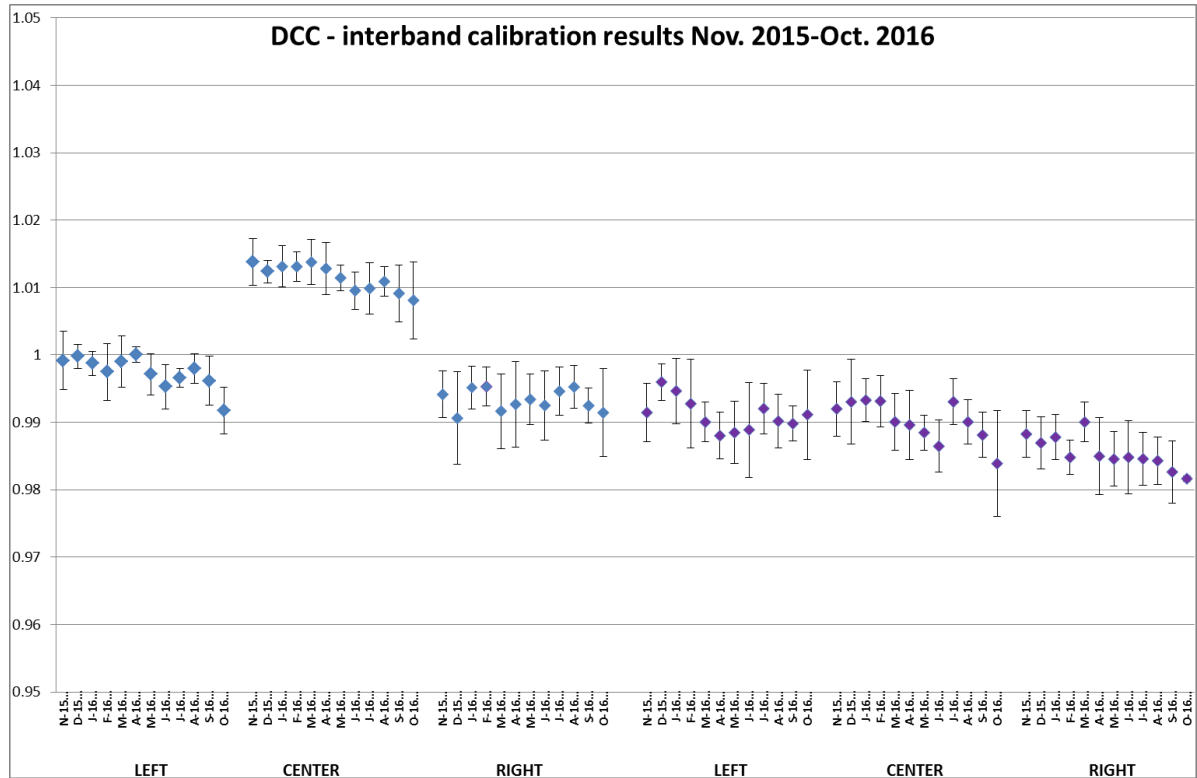


Figure 4. DCC inter-band calibration results: LEFT, CENTER and RIGHT camera

4.2. Geometric Calibration

Calibration image type	Total	Processed	Error
PROBA-V_L1C_INTERSECTION	13762	13762	0

Table 13: Processed calibration images for this reporting period

During previous month, the average ALE was < 73 m ($\sigma < 85$ m). The daily ALE evolution (see Figure 5) shows a rapid increase to maximum values of 108 m and 114 m for the BLUE channel on 20/9 and 22/9, respectively. These peaks were followed by a sharp decrease to values below 70 m on 25/9, which was again followed by a minor peak with values between 71 m (SWIR) and 81 m (BLUE) on 29/9. During the remainder of the month, the geolocation accuracy generally fluctuated between 50 m and 70 m.

The geometric accuracy was within the requirement of < 300 m, with an average compliance for all cameras of 99.3%. Daily values decreased to a minimum of 97.1 – 97.5% for the VNIR channels. After this minimum, the compliance values increased again and were well above 99% for all channels from 25/9 onwards.

Geometric ICP file

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

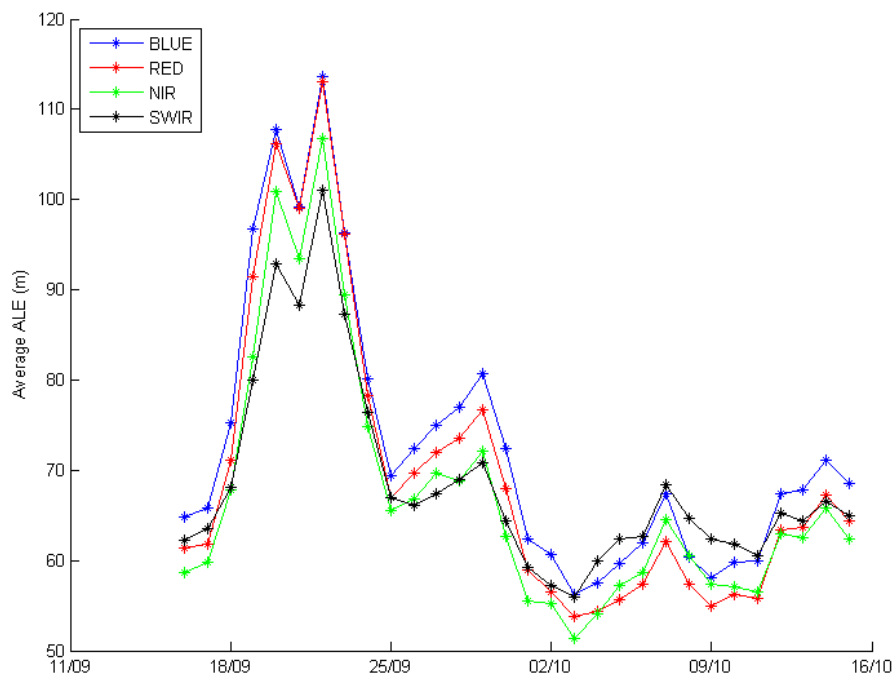


Figure 5 - Daily ALE evolution for all PROBA-V spectral bands.

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-60	LTDA Restore fails when product destination already exists on disk	Open	22/01/2016	Software
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

1 new issue was 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
1 issue are resolved but remain in the list logging purposes
3 issue(s) are 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 including types of errors and missing percentage of pixels on a daily basis:

Synthesis	Missing	Decom. Error	Geom. Error	Missing TFF	Autom. Recovery	VC4 Missing	Create Contours	Other
20160916	5.27%	7	3		1	1		
20160917	0.22%	3	3		1			
20160918	2.39%	5	6		2			
20160919	0.16%	2	2		1			
20160920	6.86%	5	6		1			1
20160921	0.00%	1						
20160922	0.40%	5	2		1			
20160923	0.00%							
20160924	0.01%	2						
20160925	0.35%	5	5		1			
20160926	0.00%	1						
20160927	1.50%	3	2		1		1	
20160928	1.23%	5	1			1		
20160929	0.01%	2						
20160930	0.39%	4	2		2		3	
20161001	2.18%	5	5		1			
20161002	0.02%	4						
20161003	4.60%	2						1
20161004	0.01%		3					
20161005	0.23%	5	2		1			
20161006	0.00%							
20161007	1.11%	2	3	1	1			
20161008	3.13%	1	1		1			
20161009	0.01%	1	2					
20161010	0.37%	2						
20161011	0.67%	4			1		1	
20161012	2.31%	1	1					
20161013	0.00%	1						
20161014	0.00%							
20161015	2.30%	2	3		1			

Table 14: 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:
The NRT production chain will be upgraded to using the new cloud detection algorithm once an extended validation is executed , currently expected November 2016.
- Hardware:
No hardware upgrades planned
- Development:
No new developments
- No other activities scheduled.

7. Operational remarks

No operational remarks.