MONTHLY OPERATIONS REPORT

MOR#025

Reporting period from 16-Dec-2015 to 15-Jan-2016

DOCUMENT CONTROL

Signatures

Author(s)   Erwin Wolters, Dennis Clarijs, Sindy Sterckx, Roger Kerckhofs

Reviewer(s)   Dennis Clarijs

Approver(s)   Dennis Clarijs

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1. Summary

In the past month, the majority of the syntheses were complete. The majority of the data gaps are caused by decompression errors, which only have a negligible impact on end products. Other possible causes of missing data in the past month are missing VC4 data during downlink or some invalid quaternion data which causes the processing to flag corresponding scanlines to 'No data'. Two synthesis products show a large gap, six a medium gap; all other syntheses have minor or negligible gaps.

Two transfer frame files were missing in the past month due to an equipment setup issue.

The cause of the misplaced header pointers leading to the daily compression errors are caused on-board and cannot be corrected on ground. Therefore, the investigation on how these could be pre-processed in nominal operation has been ceased.

A new release of the PF component in the processing chain has been done in order to make all PROBA-V level 3 products compliant with the CF conventions. All L3 products generated since this release (06/01/2016) are CF compliant. All historic data will be made CF compliant in the upcoming reprocessing campaign.

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

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	99.98	0.02[*]

Table 1: System Infrastructure availability for this reporting period

[*] Pnodes 30 to 33 registered some downtime

3. Image Processing Services

3.1. Ingested and archived products

Product Type	Total	Received	Missing data, ingested by VITO	Archived
METEO	248	248		248
TFF	311	309	2$^{(*)}$	309

Table 2: Ingested and archived products for this reporting period

$^{(*)}$ 2 x TFF missing (TFF08531, TFF08536)

3.2. Generated and archived products

Product Type	Total	Processed	Error	Archived
PROBAV_L1A - Calibration	341	341		341
PROBAV_L1A - Nominal	2525	2522	3$^{(*)}$	2524
PROBAV_L1C	2522	2522		2522
PROBAV_L3_S1_TOA_100M	31	31		31
PROBAV_L3_S1_TOC_100M	31	31		31
PROBAV_L3_S1_TOC_NDVI_100M	31	31		31
PROBAV_L3_S5_TOA_100M	6	6		6
PROBAV_L3_S5_TOC_100M	6	6		6
PROBAV_L3_S5_TOC_NDVI_100M	6	6		6
PROBAV_L3_S1_TOA_300M	31	31		31
PROBAV_L3_S1_TOC_300M	31	31		31
PROBAV_L3_S10_TOC_300M	3	3		3
PROBAV_L3_S10_TOC_NDVI_300M	3	3		3
PROBAV_L3_S1_TOA_1KM	31	31		31
PROBAV_L3_S1_TOC_1KM	31	31		31
PROBAV_L3_S10_TOC_1KM	3	3		3
PROBAV_L3_S10_TOC_NDVI_1KM	3	3		3

Table 3: Generated and archived products for this reporting period

$^{(*)}$ 3 x L1A error: 1due to a geometric error, 1 due to a missing TFF file, 1 cause is still under investigation.

3.3. Backup and archiving service

Product type	Total Files	Total File Size (GB)
TFF	301	718.85
L1A	2770	1276.22
Database transaction logs	1416	89.78
Database incremental back-up	74	25.78
Database full back-up	33	724.29

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

Product type	Total Files	Total File Size (GB)
PROBAV_TRANSFERFRAMES	289	745.81
PROBAV_L1A	2679	1320.54
PROBAV_L1C	2352	2577.03
PROBAV_L3_S1_TOA_100M	49	1041.07
PROBAV_L3_S1_TOC_100M	49	914.17
PROBAV_L3_S1_TOC_NDVI_100M	49	104.87
PROBAV_L3_S5_TOA_100M	10	875.80
PROBAV_L3_S5_TOC_100M	10	805.60
PROBAV_L3_S5_TOC_NDVI_100M	11	99.19
PROBAV_L3_S1_TOA_300M	49	534.05
PROBAV_L3_S1_TOC_300M	48	477.03
PROBAV_L3_S10_TOC_300M	31	577.41
PROBAV_L3_S10_TOC_NDVI_300M	5	7.41
PROBAV_L3_S1_TOA_1KM	50	73.83
PROBAV_L3_S1_TOC_1KM	49	66.48
PROBAV_L3_S10_TOC_1KM	6	14.79
PROBAV_L3_S10_TOC_NDVI_1KM	6	1.14
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	232	1.24
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	2518	138	144
PROBAV_L3_S1_TOA_100M	31	883	781
PROBAV_L3_S1_TOC_100M	31	691	673
PROBAV_L3_S1_TOC_NDVI_100M	31	830	382
PROBAV_L3_S5_TOA_100M	6	17	18
PROBAV_L3_S5_TOC_100M	6	190	211
PROBAV_L3_S5_TOC_NDVI_100M	6	306	500
PROBAV_L3_S1_TOA_300M	31	220	674
PROBAV_L3_S1_TOC_300M	31	909	689
PROBAV_L3_S10_TOC_300M	3	441	382
PROBAV_L3_S10_TOC_NDVI_300M	3	129	157
PROBAV_L3_S1_TOA_1KM	31	180	216
PROBAV_L3_S1_TOC_1KM	31	184	188
PROBAV_L3_S10_TOC_1KM	3	276	344
PROBAV_L3_S10_TOC_NDVI_1KM	3	195	217

Table 6: Ordered and delivered products for this reporting period

3.5. End-user activity

19 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 **673** with **91** different nationalities representing **530** different companies/universities.

Product type	Africa	Asia	Europe	N-America	Oceania	S-America
PROBAV_L1C			342.51			
PROBAV_L3_S1_TOA_100M		0.78	667.30			
PROBAV_L3_S1_TOC_100M	0.32	946.32	560.69			
PROBAV_L3_S1_TOC_NDVI_100M		9.11	0.02	0.26	0.49	
PROBAV_L3_S5_TOA_100M		0.01	1.28			
PROBAV_L3_S5_TOC_100M	47.19	2.53	615.39	644.87		
PROBAV_L3_S5_TOC_NDVI_100M	0.52	27.63	21.66			0.51
PROBAV_L3_S1_TOA_300M			4633.16			
PROBAV_L3_S1_TOC_300M		97.22	1232.05			13.74
PROBAV_L3_S10_TOC_300M	2.51	74.51	904.17			13.43
PROBAV_L3_S10_TOC_NDVI_300M		8.81	0.04		0.11	1.27
PROBAV_L3_S1_TOA_1KM			199.80			

PROBAV_L3_S1_TOC_1KM			180.77	0.00		
PROBAV_L3_S10_TOC_1KM	0.72	11.63	228.92	220.16		
PROBAV_L3_S10_TOC_NDVI_1KM	0.03	2.53	1.59		0.00	0.00

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

Product Type	Global
L1C	342.51
PROBAV_L3_S1_TOA_100M	668.09
PROBAV_L3_S1_TOC_100M	1507.32
PROBAV_L3_S1_TOC_NDVI_100M	9.88
PROBAV_L3_S5_TOA_100M	1.29
PROBAV_L3_S5_TOC_100M	1309.98
PROBAV_L3_S5_TOC_NDVI_100M	50.31
PROBAV_L3_S1_TOA_300M	4633.16
PROBAV_L3_S1_TOC_300M	1343.01
PROBAV_L3_S10_TOC_300M	994.62
PROBAV_L3_S10_TOC_NDVI_300M	10.24
PROBAV_L3_S1_TOA_1KM	199.80
PROBAV_L3_S1_TOC_1KM	180.77
PROBAV_L3_S10_TOC_1KM	461.43
PROBAV_L3_S10_TOC_NDVI_1KM	4.16

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

Company	# of downloaded products
VITO	1561
Brockmann Consult	424
Nagoya University	410
RADI, CAS	294
IFSULDEMINAS	293
Institute of Remote Sensing and Digital Earth	279
IGiK	221
Infoterra	163
NCU	142
Global Surface Intelligence	132

Table 9: Top 10 user companies for the reporting period

Company	# of registered users
BELGIUM	71
CHINA	57
ITALY	39
FRANCE	30
BRAZIL	28
UNITED KINGDOM	27
UNITED STATES	25
NETHERLANDS	23
GERMANY	21
INDIA	20

Table 10: Top 10 countries with most registered users

List of issues raised by users:

ProbaV:
- Request for PROBA-V spectral response function data
- Question on L1C data files
- Viewing Tools HDF5
- SPOT NDVI Vs PROBA-V NDVI Time series continuity
- Request for calendar
- Change in maximum latitude PROBA-V

PDF portal:
- Request for MODIS data
- Forgotten username and password
- Question on massive order download

4. Image Calibration services

4.1. Radiometric Calibration

Calibration request type	Total	Processed	Not received	Error
CLOUDS	13	13	0	0
DARK CURRENT	20	19	0	1
MOON	2	2	0	0
RAYLEIGH	40	39	0	1
SNOW	41	41	0	0
SUN_GLINT	14	14	0	0

Table 11: Calibration Image requests for this reporting period

Calibration image type	Total	Valid	Invalid
PROBA_V_L1A_CALIBRATION	2	2	0
PROBA-V_L1B_CALIBRATION	286	207	40
PROBA-V_L1B_INTERSECTION	621	277	344
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.

While for the VNIR strips calibration results from the Libya4, Rayleigh and DCC methods remain relatively stable, a slight degradation trend remains in most of the Libya-4 SWIR strips results.
It is therefore decided to update the SWIR absolute calibration coefficients slightly to correct for the degradation. The percentage change to be applied to the calibration coefficients is currently being calculated.
For a few pixels the dark current has suddenly increased in the last month, which might cause the presence of a few stripes. An update of the SWIR dark current values is required to correct for this.

Radiometric ICP file
ICP dark values and SWIR absolute calibration coefficients will be updated in the coming days.
The current ICP files are:
- PROBAV_ICP_RADIOMETRIC#LEFT_20151218_V01
- PROBAV_ICP_RADIOMETRIC#CENTER_ 20151218_V01
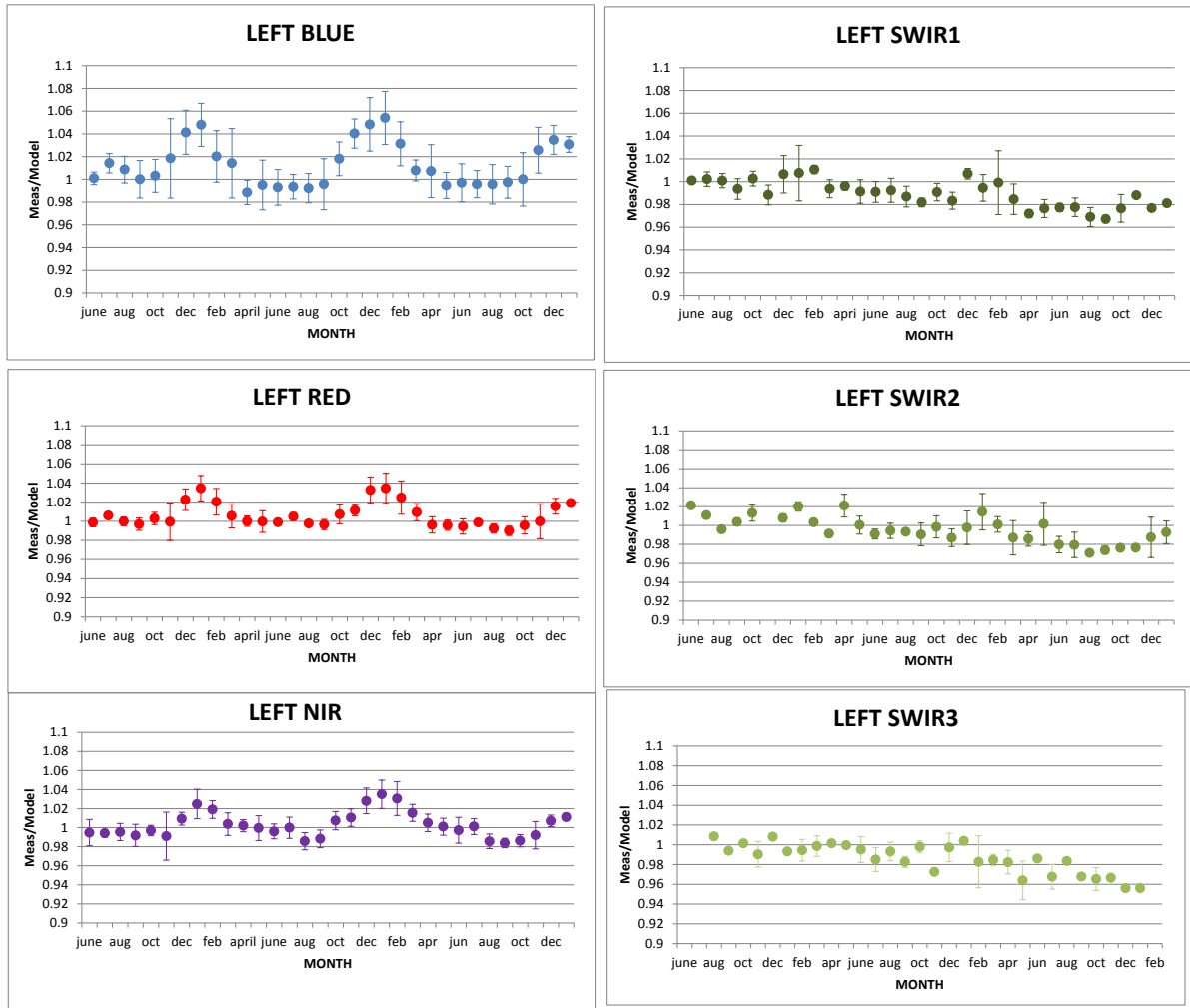- PROBAV_ICP_RADIOMETRIC#RIGHT_ 20151218_V01

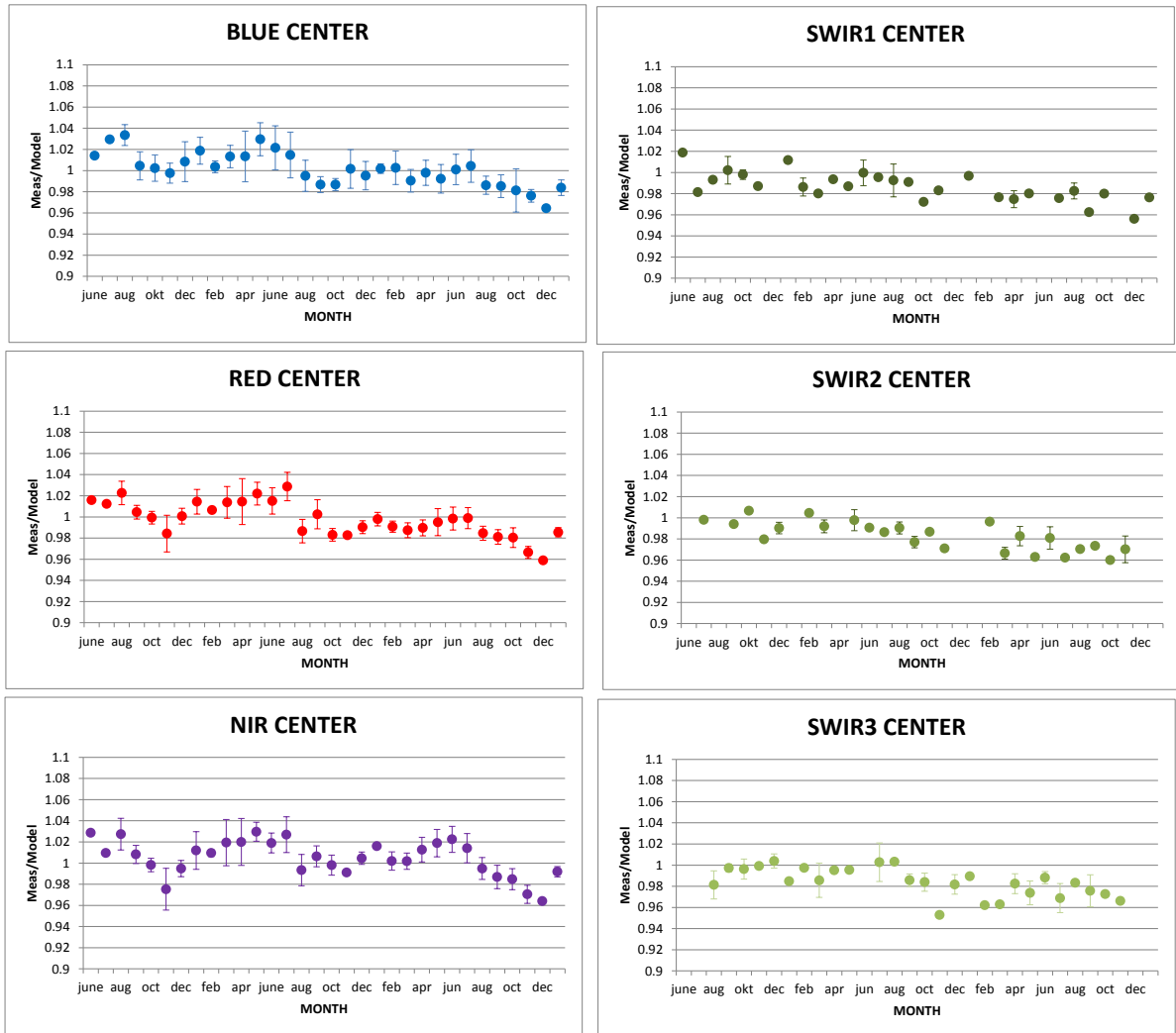*Figure 1. Libya-4 desert calibration results: LEFT monthly averaged results*

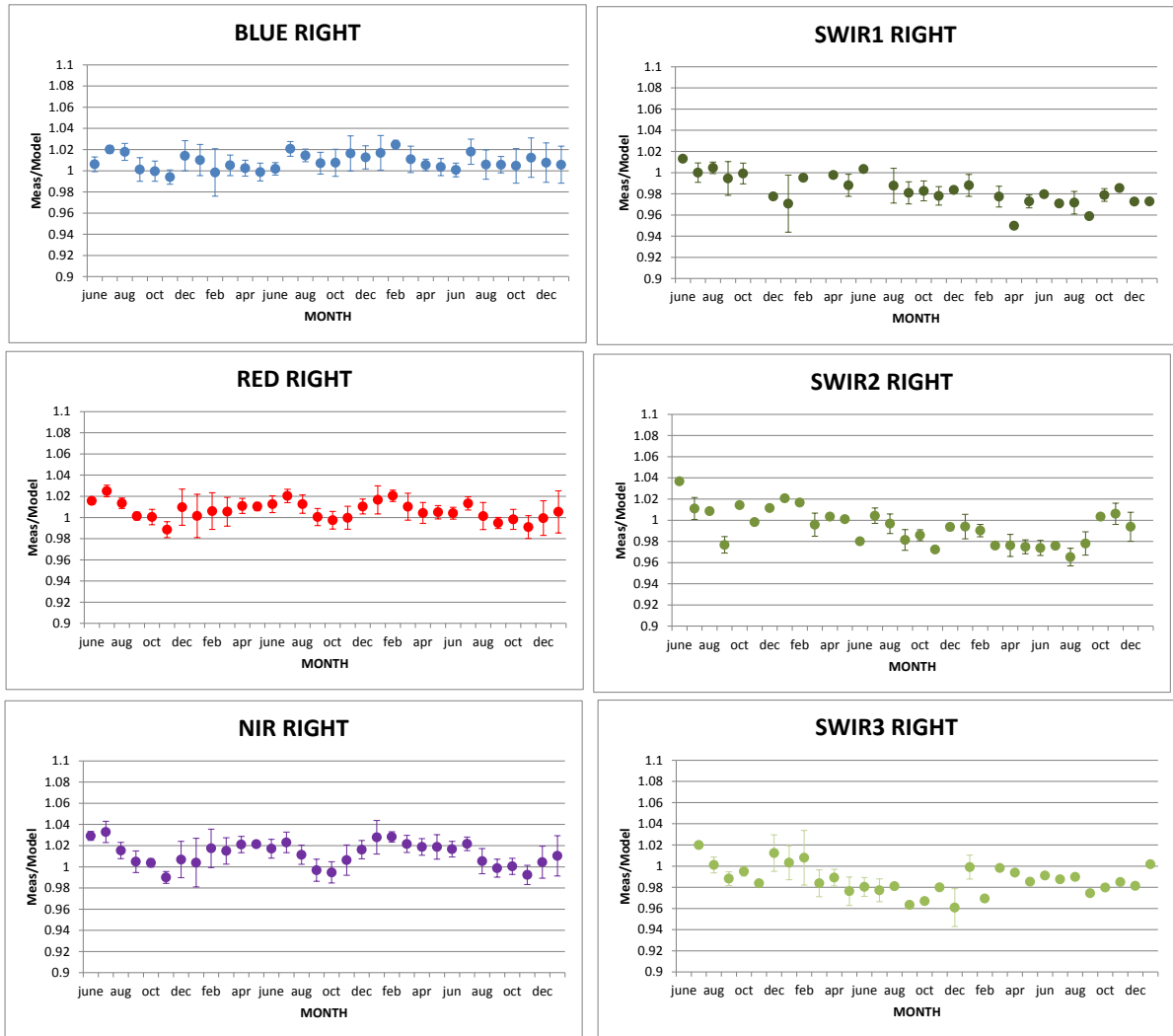*Figure 2. Libya-4 desert calibration results: CENTER monthly averaged results*

Figure 3. Libya-4 desert calibration results: RIGHT monthly averaged results
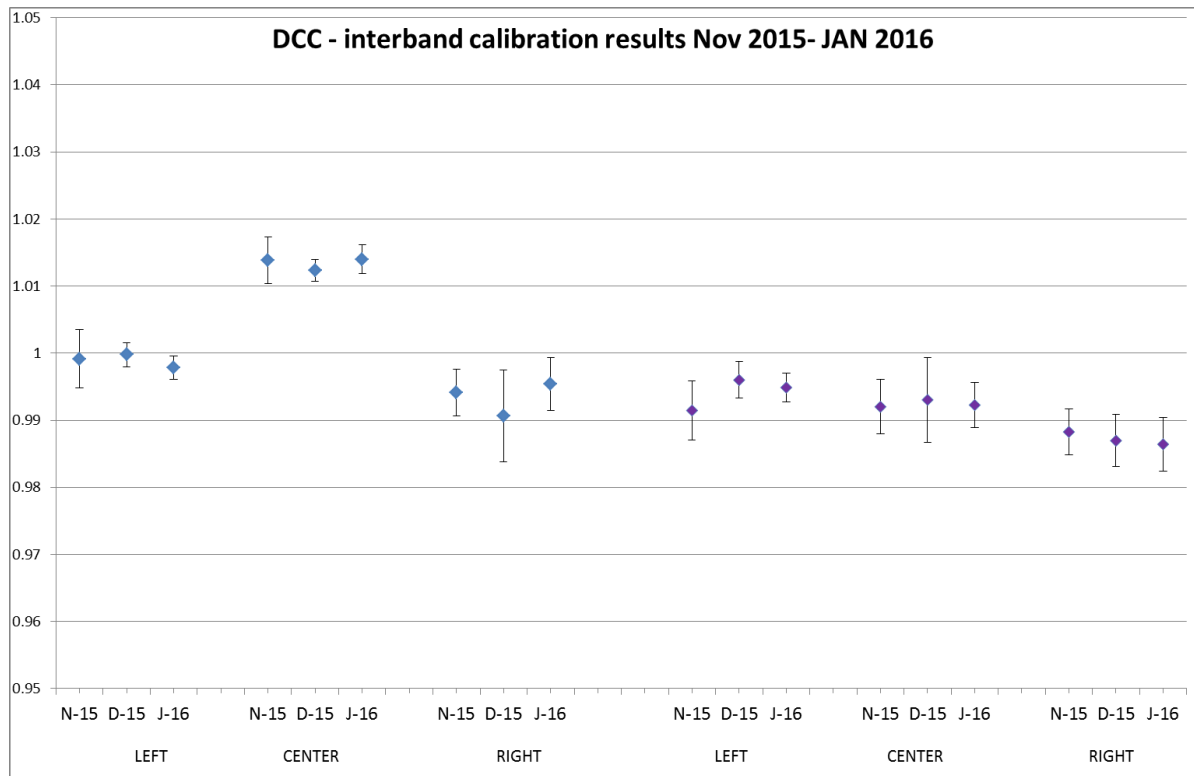
Figure 4. DCC inter-band calibration results: LEFT, CENTER and RIGHT camera

4.2. Geometric Calibration

Calibration image type	Total	Processed	Error
PROBA-V_L1C_INTERSECTION	13296	13296	

Table 13: Processed calibration images for this reporting period

During previous month, the average ALE was 78 m (σ < 95 m). Daily values started off at 55 – 60 m and increased to peak values of 90 – 95 m at 27/12, followed by a gradual decline to ~70 m thereafter. A second increase followed from 5/1 to 9/1, in which values eventually peaked at 105 – 110 m. In the remainder of the period, daily values rapidly decreased to 60 – 70 m. The daily ALE evolution can be seen in Figure 5.

The geometric accuracy was within the requirement of < 300 m, with an average compliance of 99.1%. Daily compliance values decreased to below 98% for the VNIR channels between 8/1 and 10/1, but increased rapidly to > 99% during the remainder of the period.

Geometric ICP file

- PROBAV_ICP_GEOMETRIC#LEFT_20151006_V01
- PROBAV_ICP_GEOMETRIC#CENTER_20151006_V01
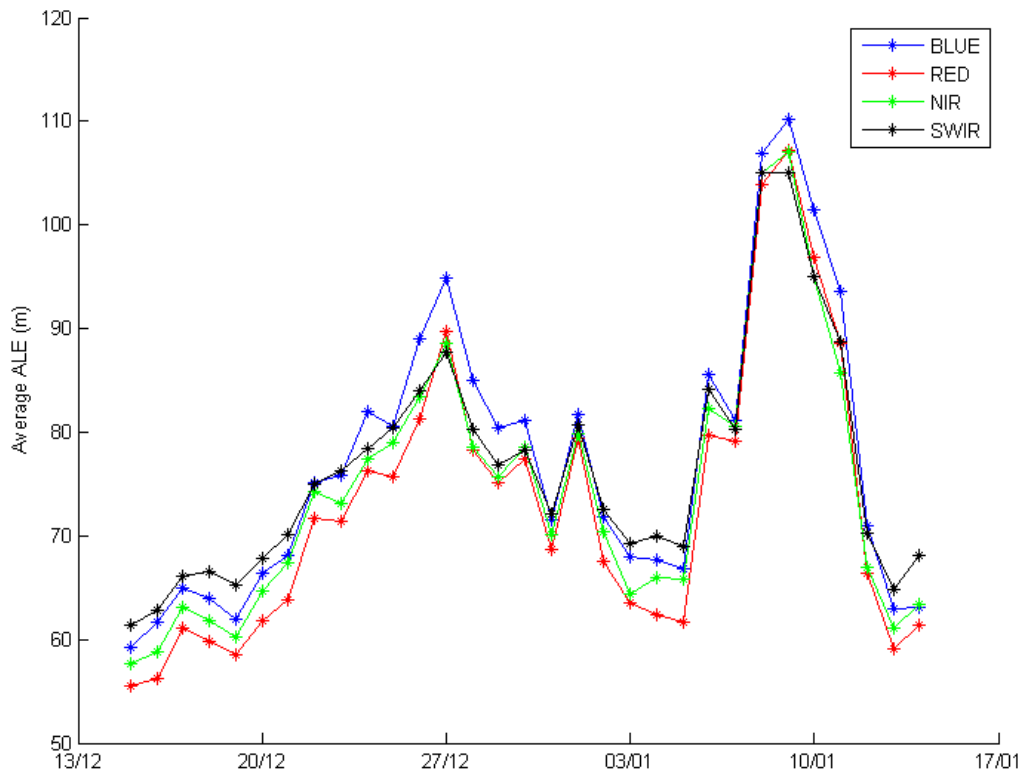- PROBAV_ICP_GEOMETRIC#RIGHT_20151006_V01

Figure 5 - Daily average ALE in this reporting period

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

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
1 issue is 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)	0	
Medium Gaps (< 10000 km²)	8	13/01, 24/12, 01/01, 11/01, 12/01, 20/12, 25/12, 15/01
Minor Gaps (< 3600 km²)	2	03/01, 31/12
Negligible Gaps (< 1000 km²)	21	29/12, 08/01, 19/12, 09/01, 14/01, 30/12, 04/01, 05/01, 10/01, 16/12, 21/12, 26/12, 27/12, 17/12, 22/12, 06/01, 07/01, 28/12, 23/12, 18/12, 02/01
Complete synthesis (no gaps)	0	

Table 9: Overview of S1 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 improvement of the cloud detection algorithm is in the validation process.

- No other activities scheduled.

7. Operational remarks

No operational remarks.