



# MONTHLY OPERATIONS REPORT

**MOR#024**

**Reporting period from 16-Nov-2015 to 15-Dec-2015**

**Reference: *PROBA-V\_D5\_MOR-024\_2015-12\_v1.0***

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## 1. Summary

In the past month, nearly all 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'. One synthesis shows a large gap, four a medium gap; all other syntheses have minor or negligible gaps.

An investigation is still ongoing to correct the misplaced header pointers in order to avoid the multiple daily decompression errors that we experience in the data.

On November 26th, on request of ESA, the Northern coverage has been extent from 82° to 87.3° SZA.

In this reporting period, one transfer frame files was missing due to an antenna malfunction.

Furthermore, a new iteration of the PF module was done to embed the missing % of pixels in the reporting. This has been further refined in the last month in order to discard the missed equatorial data due to the mission architecture. In other words, percentages missing pixels should be more reliable.

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	99.98	0.02 <sup>(*)</sup>
Master Servers	100.0	0.0
Worker Nodes	99.96	0.04 <sup>(**)</sup>
PDF	100.0	0.0

Table 1: System Infrastructure availability for this reporting period

(\*) Downtime on STFS servers due to planned maintenance

(\*\*) Unplanned downtime of one worker still under investigation

## 3. Image Processing Services

### 3.1. Ingested and archived products

Product Type	Total	Received	Missing data, ingested by VITO	Archived
METEO	240	240		240
TFF	299	299	0	299

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	471	471		471
PROBAV_L1A - Nominal	2457	2455	2 <sup>(*)</sup>	2457
PROBAV_L1C	2455	2455		2454
PROBAV_L3_S1_TOA_100M	30	30		30
PROBAV_L3_S1_TOC_100M	30	30		30
PROBAV_L3_S1_TOC_NDVI_100M	30	30		30
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	30	30		30
PROBAV_L3_S1_TOC_300M	30	30		30
PROBAV_L3_S10_TOC_300M	3	3		3
PROBAV_L3_S10_TOC_NDVI_300M	3	3		3
PROBAV_L3_S1_TOA_1KM	30	30		30
PROBAV_L3_S1_TOC_1KM	30	30		30
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

(\*)2 x L1A errors due to automatic recovery in these segments (20151130, 20151215)



### 3.3. Backup and archiving service

Product type	Total Files	Total File Size (GB)
TFF	291	722.91
L1A	2831	1289.5
Database transaction logs	1044	69.54
Database incremental back-up	56	24.87
Database full back-up	48	1057.12

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

Product type	Total Files	Total File Size (GB)
PROBAV_TRANSFERFRAMES	280	745.62
PROBAV_L1A	2709	1328.96
PROBAV_L1C	2284	2493.18
PROBAV_L3_S1_TOA_100M	55	1194.28
PROBAV_L3_S1_TOC_100M	57	1142.15
PROBAV_L3_S1_TOC_NDVI_100M	58	134.99
PROBAV_L3_S5_TOA_100M	12	1051.35
PROBAV_L3_S5_TOC_100M	12	1012.67
PROBAV_L3_S5_TOC_NDVI_100M	12	115.37
PROBAV_L3_S1_TOA_300M	56	612.79
PROBAV_L3_S1_TOC_300M	84	965.32
PROBAV_L3_S10_TOC_300M	6	111.87
PROBAV_L3_S10_TOC_NDVI_300M	6	9.37
PROBAV_L3_S1_TOA_1KM	58	84.56
PROBAV_L3_S1_TOC_1KM	56	77.11
PROBAV_L3_S10_TOC_1KM	6	14.94
PROBAV_L3_S10_TOC_NDVI_1KM	6	1.15
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	220	0.27
METEO_METEOSERVICES	224	1.19
POLARMOTION	1	<0.01

Table 5: Archived data volumes for this reporting period

### 3.4. Dissemination service

Product type	Added to catalogue	Ordered	Delivered
PROBAV_L1C	2454	699	691
PROBAV_L3_S1_TOA_100M	30	122	114
PROBAV_L3_S1_TOC_100M	31	393	587
PROBAV_L3_S1_TOC_NDVI_100M	31	10	34
PROBAV_L3_S5_TOA_100M	6	3	7
PROBAV_L3_S5_TOC_100M	6	786	784
PROBAV_L3_S5_TOC_NDVI_100M	6	995	1548
PROBAV_L3_S1_TOA_300M	30	696	535
PROBAV_L3_S1_TOC_300M	30	3121	3300
PROBAV_L3_S10_TOC_300M	3	210	200
PROBAV_L3_S10_TOC_NDVI_300M	3	112	139
PROBAV_L3_S1_TOA_1KM	30	205	1377
PROBAV_L3_S1_TOC_1KM	30	232	277
PROBAV_L3_S10_TOC_1KM	3	18	23
PROBAV_L3_S10_TOC_NDVI_1KM	3	329	354

Table 6: Ordered and delivered products for this reporting period

### 3.5. End-user activity

33 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 **652** with **91** different nationalities representing **519** different companies/universities.

Product type	Africa	Asia	Europe	N-America	Oceania	S-America
PROBAV_L1C			1255.24			
PROBAV_L3_S1_TOA_100M	0.41	0.45	18.71	1.06	0.00	
PROBAV_L3_S1_TOC_100M		837.96	2984.23	0.24		
PROBAV_L3_S1_TOC_NDVI_100M		0.60	0.13	0.58		0.02
PROBAV_L3_S5_TOA_100M		0.79	89.44	0.41		0.07
PROBAV_L3_S5_TOC_100M	114.44	16.21	2259.69	1380.45	2.15	0.08
PROBAV_L3_S5_TOC_NDVI_100M	0.05	336.56	64.43			17.48
PROBAV_L3_S1_TOA_300M		0.01	3883.82			
PROBAV_L3_S1_TOC_300M	0.11	27.61	1627.64			124.01
PROBAV_L3_S10_TOC_300M	24.55	6.00	457.39		1.61	
PROBAV_L3_S10_TOC_NDVI_300M	0.22	0.66	1.89			0.03
PROBAV_L3_S1_TOA_1KM		0.08	1304.90			

PROBAV_L3_S1_TOC_1KM		37.61	219.56	2.11		
PROBAV_L3_S10_TOC_1KM	0.63		15.95	3.39		
PROBAV_L3_S10_TOC_NDVI_1KM	1.43	0.10	1.72	0.08		

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

Product Type	Global
L1C	1255.24
PROBAV_L3_S1_TOA_100M	20.63
PROBAV_L3_S1_TOC_100M	3822.44
PROBAV_L3_S1_TOC_NDVI_100M	1.32
PROBAV_L3_S5_TOA_100M	90.70
PROBAV_L3_S5_TOC_100M	3773.02
PROBAV_L3_S5_TOC_NDVI_100M	418.52
PROBAV_L3_S1_TOA_300M	3883.83
PROBAV_L3_S1_TOC_300M	1864.43
PROBAV_L3_S10_TOC_300M	489.55
PROBAV_L3_S10_TOC_NDVI_300M	2.81
PROBAV_L3_S1_TOA_1KM	1304.98
PROBAV_L3_S1_TOC_1KM	259.28
PROBAV_L3_S10_TOC_1KM	19.98
PROBAV_L3_S10_TOC_NDVI_1KM	3.34

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

Company	# of downloaded products
VITO	1481
Geoinformation Systems	1090
ESA	857
Politecnico di Bari	694
IFSULDEMINAS	678
Institute of Remote Sensing and Digital Earth	477
University of Leicester	455
Brockmann Consult	402
Global Surface Intelligence	388
Université Paris Diderot	248

Table 9: Top 10 user companies for the reporting period





Company	# of registered users
BELGIUM	68
CHINA	56
ITALY	34
FRANCE	30
BRAZIL	27
UNITED KINGDOM	26
UNITED STATES	25
NETHERLANDS	23
INDIA	20
GERMANY	20

Table 10: Top 10 countries with most registered users

**List of issues raised by users:**

ProbaV:

- ESA request for additional DEM information
- Question on 100 m TOC NDVI products
- Explanation on file name versioning (relevant changes between V002 and old V001 versions)
- Question on NDVI scaling factors in PROBA-V 100 m data

PDF portal:

- Questions on massive ordering and subscriptions
- username forgotten
- 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	23	20	3	0
DARK CURRENT	25	22	3	0
MOON	2	2	0	0
RAYLEIGH	64	58	6	0
SNOW	26	25	1	0
SUN_GLINT	57	47	10	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 <sup>(*)</sup>	469	265	69
PROBA-V_L1B_INTERSECTION <sup>(*)</sup>	622	337	270
PROBA-V_L1B_OVERLAPREGION	0	0	0

Table 12: Processed calibration images for this reporting period

<sup>(\*)</sup> 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. For the LEFT VNIR strips a slight increase in the Libya-4 desert calibration results is observed; while for the CENTER VNIR strips a decrease is observed. As similar seasonal patterns were also observed in the previous years and as the other calibration methods do not confirm the trend, it is decided to not yet update the ICP absolute calibration parameters, but to closely follow the trend during the next months.

The high scattering and slight decrease in the deep convective clouds interband calibration results, reported in the previous report for mainly CENTER BLUE strip, was caused by saturated cloud pixels which were erroneously taken into account in the image averaged results. The DCC images are therefore currently being reprocessed. The first reprocessed results (not shown) do not longer show a decreasing trend over the last 3 months.

An update of the dark current values will therefore be done in the next days. Furthermore the status of the following SWIR pixel will be changed to BAD: CENTER SWIR3 pixel 640.

**Radiometric ICP file**

ICP dark values and pixel status will be updated in the coming days.

The current ICP files are:

- PROBAV\_ICP\_RADIOMETRIC#LEFT\_20151119\_V01
- PROBAV\_ICP\_RADIOMETRIC#CENTER\_20151119\_V01
- PROBAV\_ICP\_RADIOMETRIC#RIGHT\_20151119\_V01

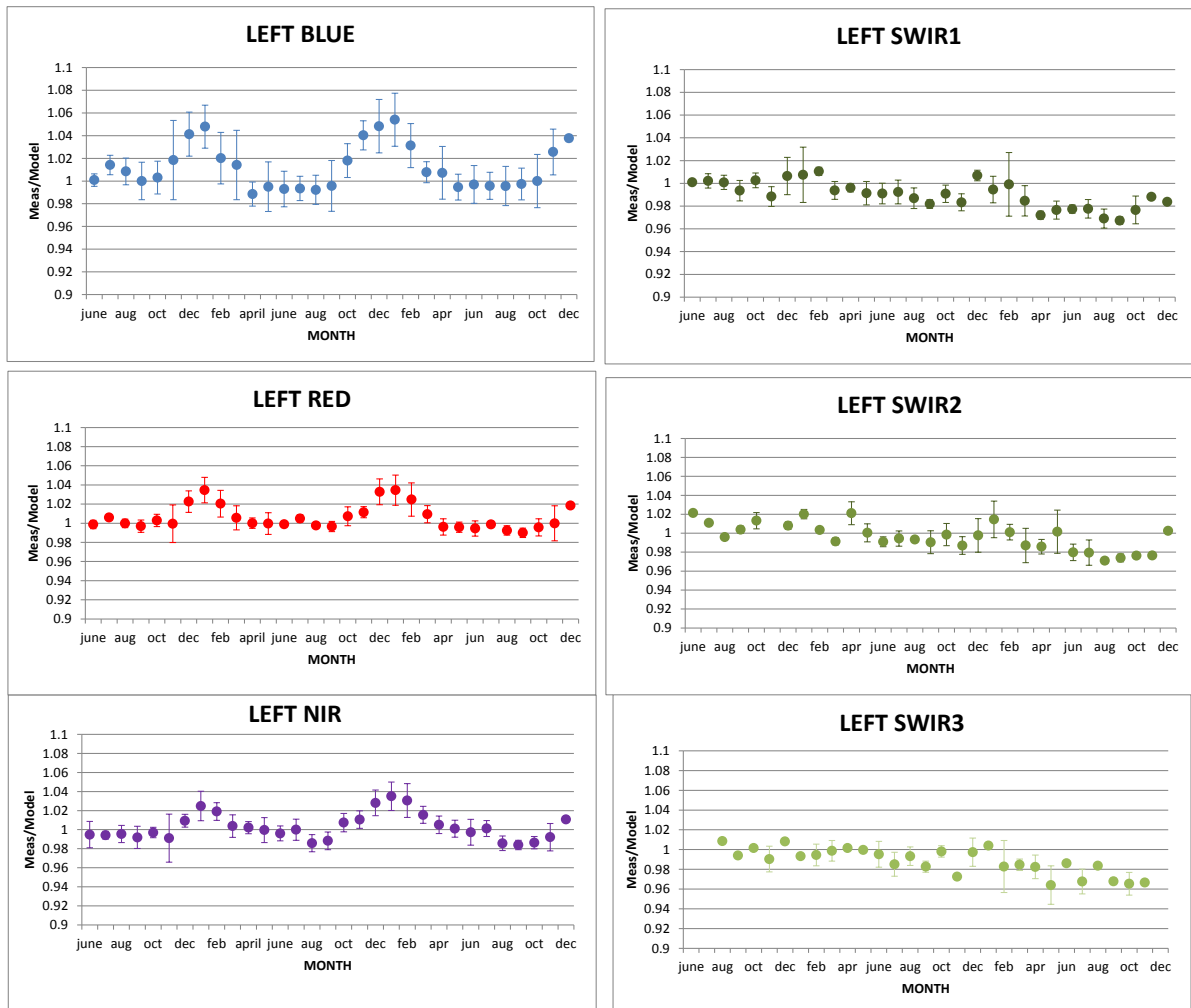


Figure 1. Libya-4 desert calibration results: LEFT monthly averaged results

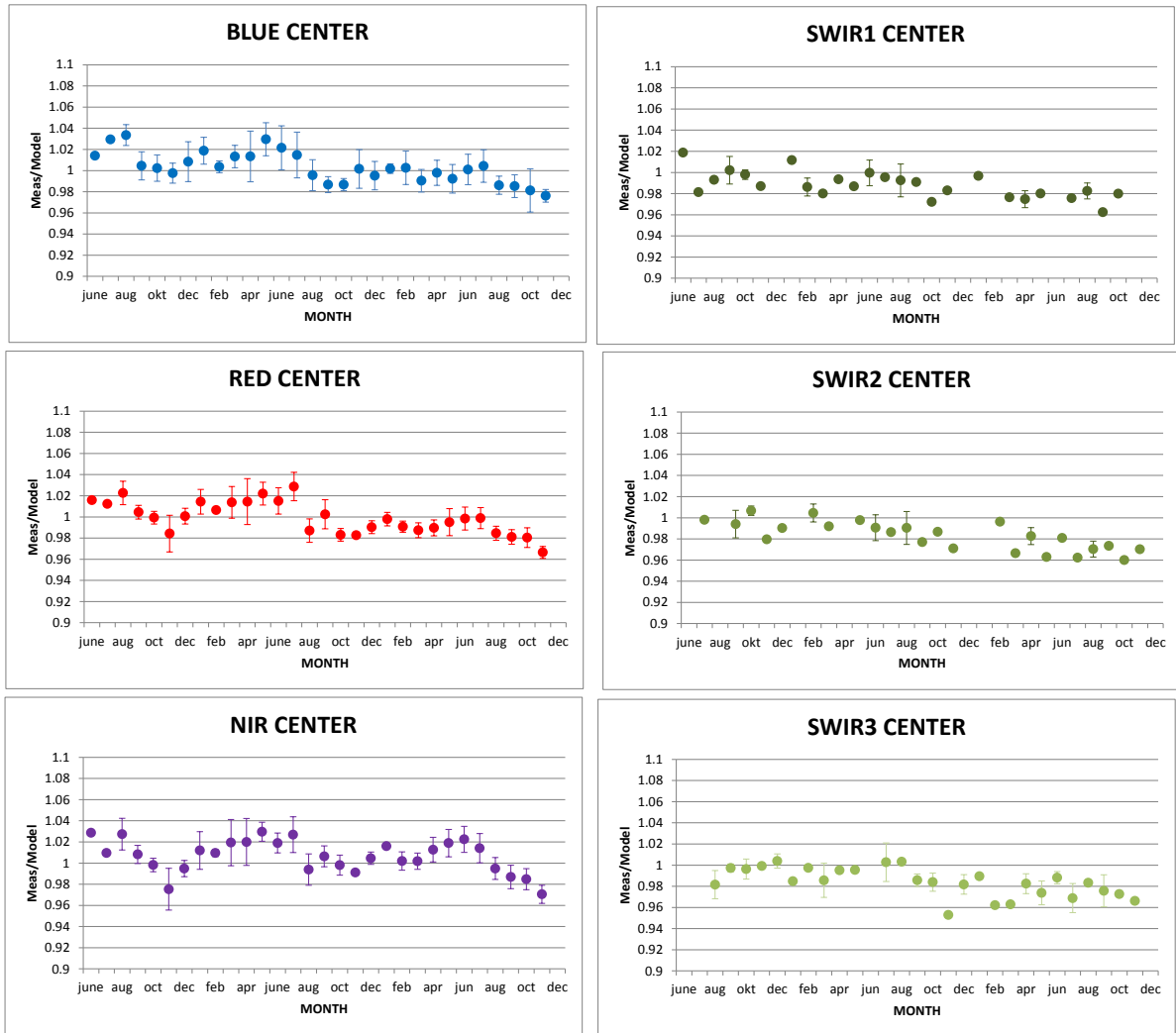


Figure 2. Libya-4 desert calibration results: CENTER monthly averaged results

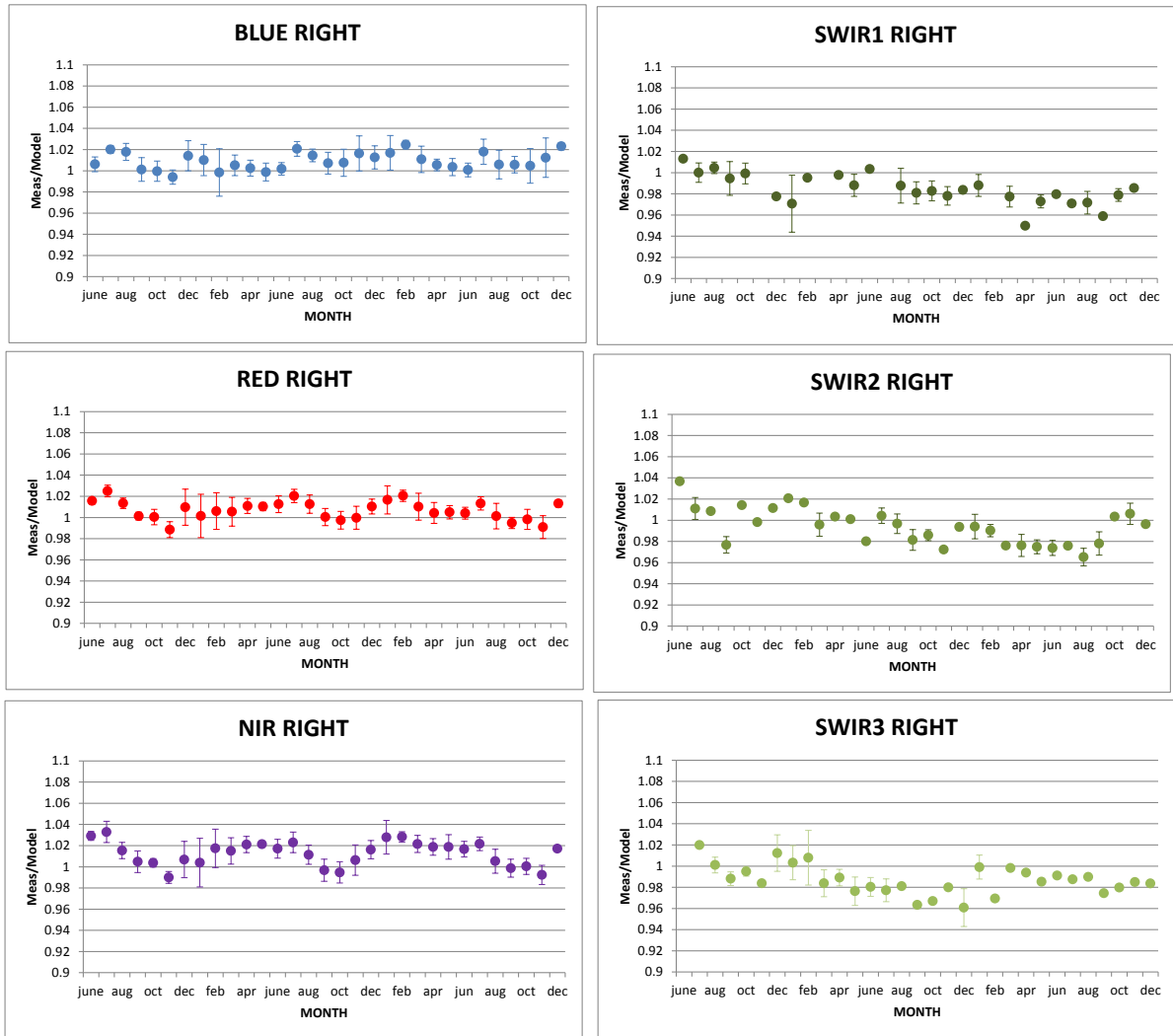


Figure 3. Libya-4 desert calibration results: RIGHT monthly averaged results

## 4.2. Geometric Calibration

Calibration image type	Total	Processed	Error
PROBA-V_L1C_INTERSECTION	13044	13044	0

Table 13: Processed calibration images for this reporting period

During the period 16/11 – 15/12, the average ALE was < 70 m ( $\sigma < 87$  m). Daily values started off at 55 – 65 m and sharply increased to 90 m for the BLUE channel at 26/11. Subsequently, daily values alternated between 65 and 85 m during the period 1/12 – 7/12, after which they stabilized at 55 – 65 m. The daily ALE evolution is shown in Figure 4.

The geometric accuracy was within the requirement of < 300 m, with an average compliance of 99.3%. Minimum daily values for the VNIR channels occurred at 26/11 (98.3 – 98.9%) and 7/12 (98.4 – 99.1%).

### Geometric ICP file

- PROBAV\_ICP\_GEOMETRIC#LEFT\_20151027\_V01
- PROBAV\_ICP\_GEOMETRIC#CENTER\_20151027\_V01
- PROBAV\_ICP\_GEOMETRIC#RIGHT\_20151027\_V01

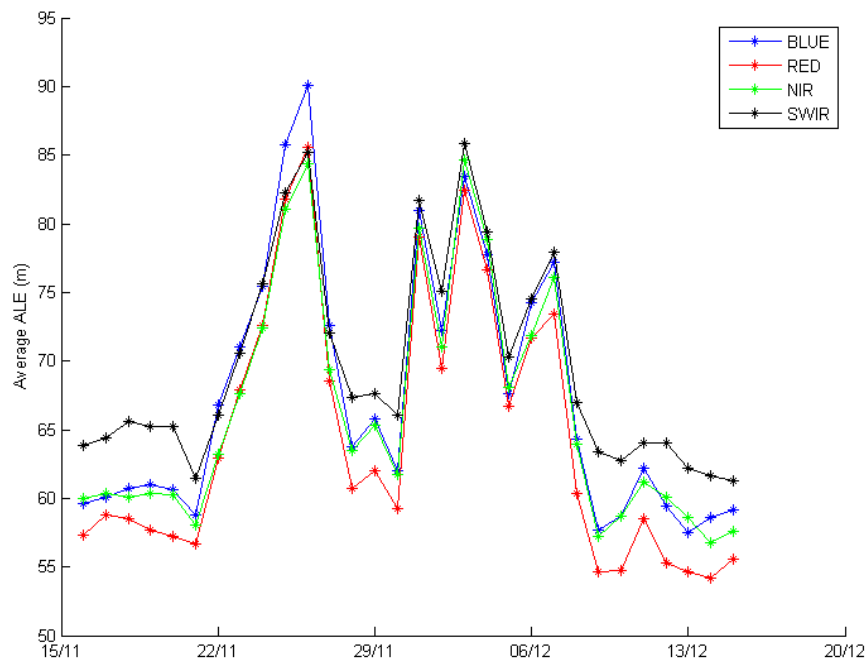


Figure 4. Monthly ALE values

## 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-58</a>	Sync workflow only resets active threads from 'Synchronizing' to 'ToBeSynchronized'	Closed	16/11/2015	Software
<a href="#">PROBAVUS-7</a>	Very small images fail to process	Resolved	10/01/2014	General

- 1** new issue was logged during this reporting period
- 1** 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
<b>Major Gaps (&gt; 21600 km<sup>2</sup> (missing TFF))</b>	0	
<b>Large Gaps (&lt; 21600 km<sup>2</sup>)</b>	1	18/11
<b>Medium Gaps (&lt; 10000 km<sup>2</sup>)</b>	2	15/12, 06/12
<b>Minor Gaps (&lt; 3600 km<sup>2</sup>)</b>	1	03/12
<b>Negligible Gaps (&lt; 1000 km<sup>2</sup>)</b>	26	19/11, 24/11, 29/11, 04/12, 14/12, 09/12, 26/11, 11/12, 01/12, 12/12, 07/12, 22/11, 02/12, 17/11, 27/11, 05/12, 30/11, 25/11, 10/12, 20/11, 16/11, 21/11, 28/11, 08/12, 23/11, 13/12
<b>Complete synthesis (no gaps)</b>	0	

Table 14: Overview of S1 for this reporting period



## 6. Scheduled activities for the next period(s)

- Software upgrades:  
No software upgrades planned in the near future
- Hardware:  
No hardware upgrades planned
- Development:  
An improvement of the cloud detection algorithm is under investigation.
- No other activities scheduled.

## 7. Operational remarks

No operational remarks.