



MONTHLY OPERATIONS REPORT

MOR#054

Reporting period from 16-May-2018 to 15-Jun-2018

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1. Summary

In this reporting period, the most of the the synthesis products were nearly complete. Missing data in the synthesis products were mainly caused by decompression and geometric errors and some automatic recoveries of the platform. No transfer frame files were missing.

On May 31st 2018, a problem on the storage cluster occurred after the primary storage node had a boot problem. The redundant node did not take over automatically which resulted in some unavailability of the data on storage cluster and MEP environment. No data was lost due to this unique event. Further actions are being taken with the supplier to mitigate the risk of a future occurrence.

From May 29 to May 31st, the PROBA-V symposium was held in the city of Ostend in Belgium. VITO supported the organisation of this event before and during the event.

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

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	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	257	257	0	257
PROBAV_L1A - Nominal	2618	2617	1	2618
PROBAV_L1C	2617	2617	0	2614
PROBAV_L2A_100M	911	911	0	911
PROBAV_L2A_300M	2617	2617	0	2617
PROBAV_L2A_1KM	2617	2617	0	2617
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

(*) 1 x L1A error due to geometric processing

3.3. Backup and archiving service

Product type	Total Files	Total File Size (GB)
TFF	300	691.06
L1A	2785	1383.86
Database transaction logs	768	82.13
Database incremental back-up	40	10.21
Database full back-up	5	180.48

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

Product type	Total Files	Total File Size (GB)
PROBAV_TRANSFERFRAMES	310	767.00
PROBAV_L1A	2881	1536.09
PROBAV_L1C	2621	3002.07
PROBAV_L2A_100M	1825	1629.82
PROBAV_L2A_300M	5224	848.20
PROBAV_L2A_1KM	5224	113.02
PROBAV_L3_S1_TOA_100M	63	1758.65
PROBAV_L3_S1_TOC_100M	62	1779.97
PROBAV_L3_S1_TOC_NDVI_100M	62	201.76
PROBAV_L3_S5_TOA_100M	11	1116.83
PROBAV_L3_S5_TOC_100M	11	1153.72
PROBAV_L3_S5_TOC_NDVI_100M	11	127.65
PROBAV_L3_S1_TOA_300M	62	753.94
PROBAV_L3_S1_TOC_300M	63	791.12
PROBAV_L3_S10_TOC_300M	5	105.40
PROBAV_L3_S10_TOC_NDVI_300M	5	8.98
PROBAV_L3_S1_TOA_1KM	62	101.94
PROBAV_L3_S1_TOC_1KM	62	104.58
PROBAV_L3_S10_TOC_1KM	5	14.41
PROBAV_L3_S10_TOC_NDVI_1KM	6	1.36
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	245	0.30
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	2623	109	112
PROBAV_L2A_100M	912	7	70
PROBAV_L2A_300M	2623	39	99
PROBAV_L2A_1KM	2623	0	17
PROBAV_L3_S1_TOA_100M	31	202	73
PROBAV_L3_S1_TOC_100M	31	1952	1675
PROBAV_L3_S1_TOC_NDVI_100M	31	47	73
PROBAV_L3_S5_TOA_100M	6	111	110
PROBAV_L3_S5_TOC_100M	6	1623	1618
PROBAV_L3_S5_TOC_NDVI_100M	6	1239	1335
PROBAV_L3_S1_TOA_300M	31	254	251
PROBAV_L3_S1_TOC_300M	31	5325	5159
PROBAV_L3_S10_TOC_300M	3	189	185
PROBAV_L3_S10_TOC_NDVI_300M	3	156	166
PROBAV_L3_S1_TOA_1KM	31	95	108
PROBAV_L3_S1_TOC_1KM	31	459	515
PROBAV_L3_S10_TOC_1KM	3	177	181
PROBAV_L3_S10_TOC_NDVI_1KM	3	457	471

Table 6: Ordered and delivered products for this reporting period

3.5. End-user activity

25 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 **1437** with **117** different nationalities representing **1078** different companies/universities.

Product type	Africa	Asia	Europe	N-America	Oceania	S-America
PROBAV_L1C	0	368.08	12.87	0	0	0
PROBAV_L2A_100M	0	7.56	96.85	0	0	0
PROBAV_L2A_300M	0	0.02	15.71	0	0	0
PROBAV_L2A_1KM	0	0.05	0.14	0	0	0
PROBAV_L3_S1_TOA_100M	0.08	0	2.77	0	0.06	0
PROBAV_L3_S1_TOC_100M	0	346.33	757.64	710.89	0	0
PROBAV_L3_S1_TOC_NDVI_100M	0	0.06	0.67	0.03	0	3.43
PROBAV_L3_S5_TOA_100M	0	0	535.72	0	0	0.01
PROBAV_L3_S5_TOC_100M	17.07	438.47	600.97	654.83	0	0.06

PROBAV_L3_S5_TOC_NDVI_100M	0	32.22	34.19	0	0	11.75
PROBAV_L3_S1_TOA_300M	0	2.45	980.68	0	0	0
PROBAV_L3_S1_TOC_300M	4.56	0.70	8690.42	306.96	0	0
PROBAV_L3_S10_TOC_300M	3.80	120.97	179.46	0	0	0
PROBAV_L3_S10_TOC_NDVI_300M	2.19	0.34	0.07	0	0	0.04
PROBAV_L3_S1_TOA_1KM	0	0.01	145.22	0.00	0	0
PROBAV_L3_S1_TOC_1KM	0	0.12	685.95	0	0	0
PROBAV_L3_S10_TOC_1KM	0.20	0.01	216.53	0.88	0	0
PROBAV_L3_S10_TOC_NDVI_1KM	0.58	39.40	0.79	0	0	0.01

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

Product Type	Global
L1C	380.96
PROBAV_L2A_100M	104.41
PROBAV_L2A_300M	15.73
PROBAV_L2A_1KM	0.19
PROBAV_L3_S1_TOA_100M	2.90
PROBAV_L3_S1_TOC_100M	1814.85
PROBAV_L3_S1_TOC_NDVI_100M	4.19
PROBAV_L3_S5_TOA_100M	535.73
PROBAV_L3_S5_TOC_100M	1711.40
PROBAV_L3_S5_TOC_NDVI_100M	78.16
PROBAV_L3_S1_TOA_300M	983.14
PROBAV_L3_S1_TOC_300M	9002.64
PROBAV_L3_S10_TOC_300M	304.23
PROBAV_L3_S10_TOC_NDVI_300M	2.64
PROBAV_L3_S1_TOA_1KM	145.24
PROBAV_L3_S1_TOC_1KM	686.07
PROBAV_L3_S10_TOC_1KM	217.62
PROBAV_L3_S10_TOC_NDVI_1KM	40.77

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

Company	# Downloads
TECHNICAL UNIVERSITY OF DRESDEN	4066
UNIVESITY URMIA	2097
BROCKMANN CONSULT	1141
ICBA	726
VITO	401

LEGOS	397
CONSORZIO LAMMA	300
AUB	298
CAS-RADI	183
IGSNRR, CAS	168

Table 9: Top 10 user companies for the reporting period

Country	# Users
CHINA	140
BELGIUM	115
FRANCE	68
UNITED STATES	66
BRAZIL	65
ITALY	65
INDIA	62
UNITED KINGDOM	54
NETHERLANDS	49
GERMANY	48

Table 10: Top 10 countries with most registered users

List of issues raised by users:

RuntimeError: module compiled against API version 0xc but this version of numpy is 0xb
Quick question
pip3.5 in pyspark bug met cloudpickle en filehandler
Docker in VM
python job op cluster
RStudio Server / Spark update timeframe
SSH rsa key access werkt niet
satelite images
'mep_airflow' toevoegen aan groep 'hspf-nrt'!?
Running job on cluster
ssh_exchange_identification: Connection closed by remote host
2018/1/19 - image type inquiry
nieuwe jobs niet mogelijk
Request read-only mount in VM
Verzoek om 3 nieuwe user names voor het GMGIT team
Data access on my new VM
FW: Kalman problem not solved :-(
Error message by Exit (maar faalt niet)
2018/5/31 - PROBA-V Mission Exploitation Platform - My MEP is stuck
May 31 12:44:11 airflow-dev.vgt.vito.be scl[23322]: [2018-05-31 12:44:11 +0200] [23326]
[CRITICAL] WORKER TIMEOUT (pid:23332)
2018/5/29 - PROBA-V Mission Exploitation Platform - Problem with RStudio
Broken DAG: [/tmp_epod/airflow/development/dags/ndvi2_dag.py] [Errno 2] No such file

or directory: '/tmp_epod/hspf/dev/workflows/probav/ndvi2/step_all/config/config.ini'
Help with unknown error
2018/5/29 - i forgot my password and user name
MEP resources default queue
time series viewer
JupyterSpark MEP probleem
FW: Request VM confirmation
Order "C0172860" is submitted
MEP probleem met Numpy/Tensorflow
2018/5/22 - PROBA-V Mission Exploitation Platform - Time Series Viewer
2018/5/22 - nombre de usuario
2018/5/18 - PROBA-V Mission Exploitation Platform - OpenSearch count operation
PROBA MEP VM connection
Re: [VITO RS] Re: Re: PROBA MEP VM creation
Needed R packages on the cluster
/opt/rh/rh-python35/root/usr/bin/python: error while loading shared libraries:
libpython3.5m.so.rh-python35-1.0: cannot open shared object file: No such file or directory
Order "S0172780" is submitted
pip3.5 install werkt blijkbaar alleen met pakketen die op
<https://artifactory.vgt.vito.be/api/pypi/python-packages/simple> staan
Re: PROBA MEP VM creation
Matplotlib issue voor Python 3 op MEP

4. Image Calibration services

4.1. Radiometric Calibration

Calibration request type	Total	Processed	Not received	Error
CLOUDS	15	15	0	0
DARK CURRENT	21	21	0	0
MOON	2	2	0	0
RAYLEIGH	49	48	1	0
SNOW	0	0	0	0
SUN_GLINT	0	0	0	0

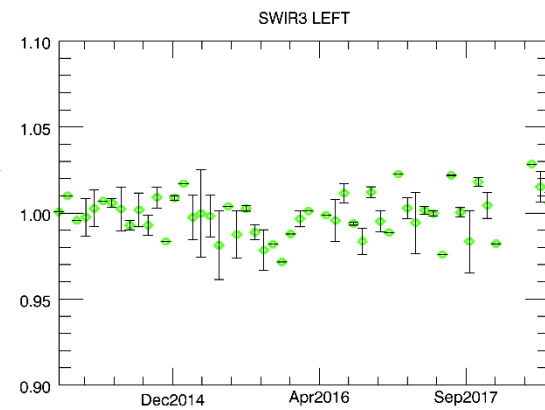
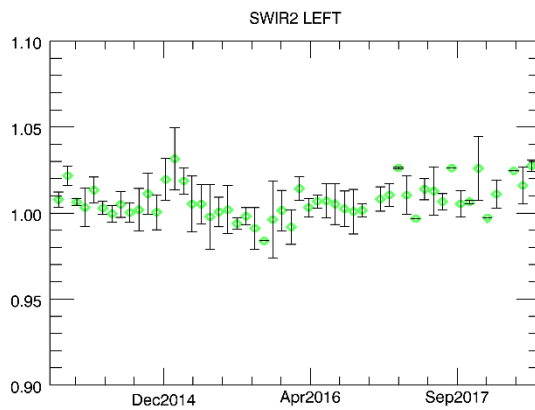
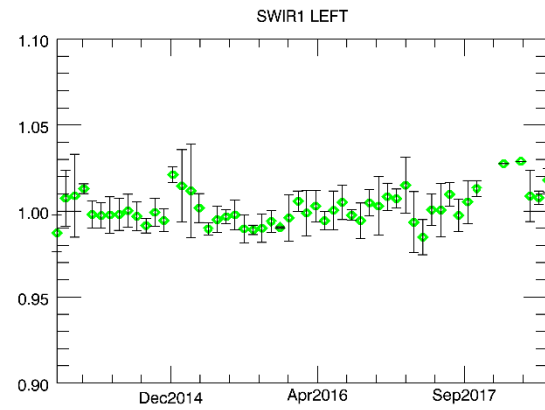
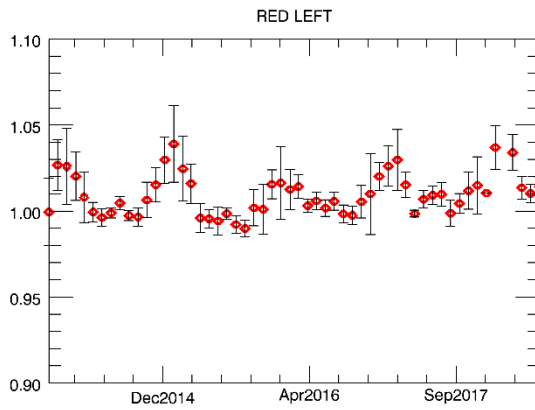
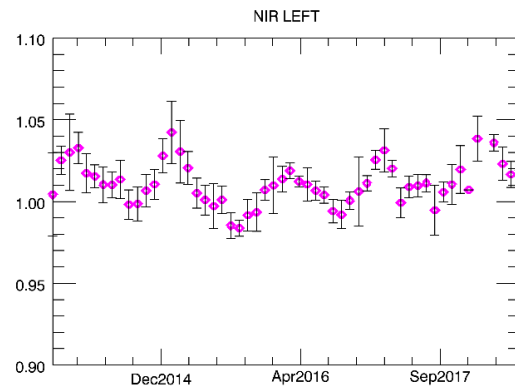
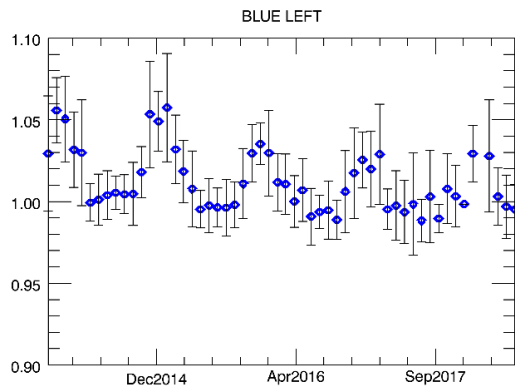
Table 11: Calibration Image requests for this reporting period

Calibration image type	Total	Valid	Invalid
PROBA_V_L1A_CALIBRATION	2	2	0
PROBA-V_L1B_CALIBRATION	255	234	21
PROBA-V_L1B_INTERSECTION	785	432	352
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



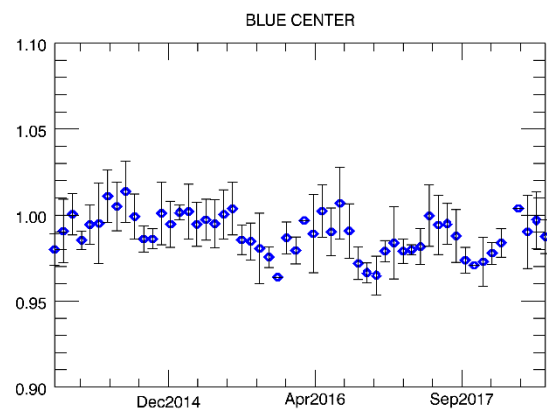
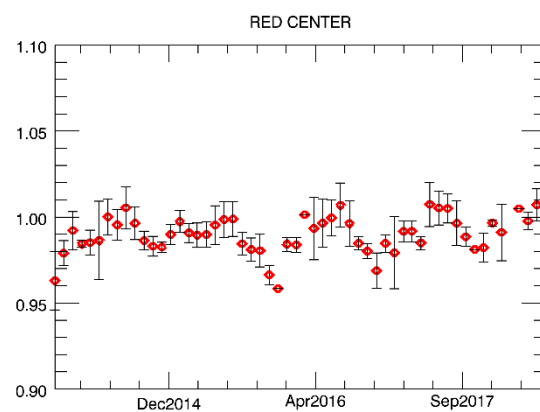
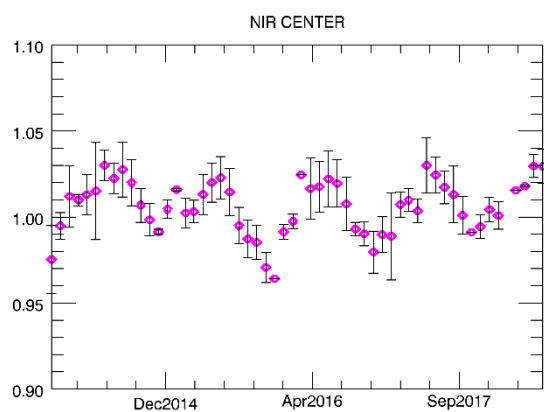


Figure 1 and



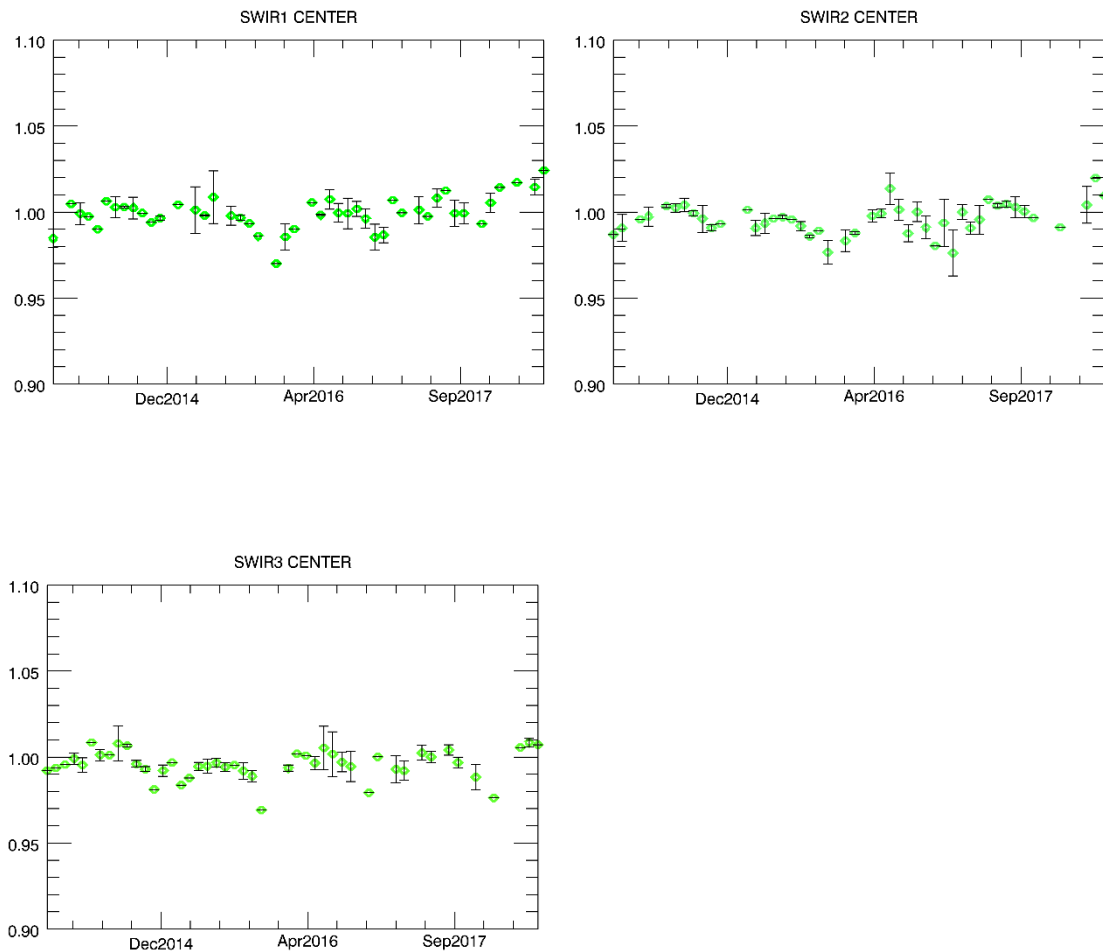


Figure 2

and **Error! Reference source not found..** Deep convective clouds interband calibration results are given in Figure 4.

No specific changes in the radiometric calibration results are seen in the latest calibration results. Although a degradation model for center and left BLUE strips is in place since about 13 months, some decrease in the DCC inter-band calibration results is still observed for the blue band. This might also be linked to increase in responsivity observed for the RED strips. The investigation to identify the causes of a slightly different degradation slope observed in the lunar center SWIR 2 calibration results (not shown) compared to the desert results is still on-going.

No new bad pixels have been identified.

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_20180601_V01
- PROBAV_ICP_RADIOMETRIC#CENTER_20180601_V01
- PROBAV_ICP_RADIOMETRIC#RIGHT_20180601_V01

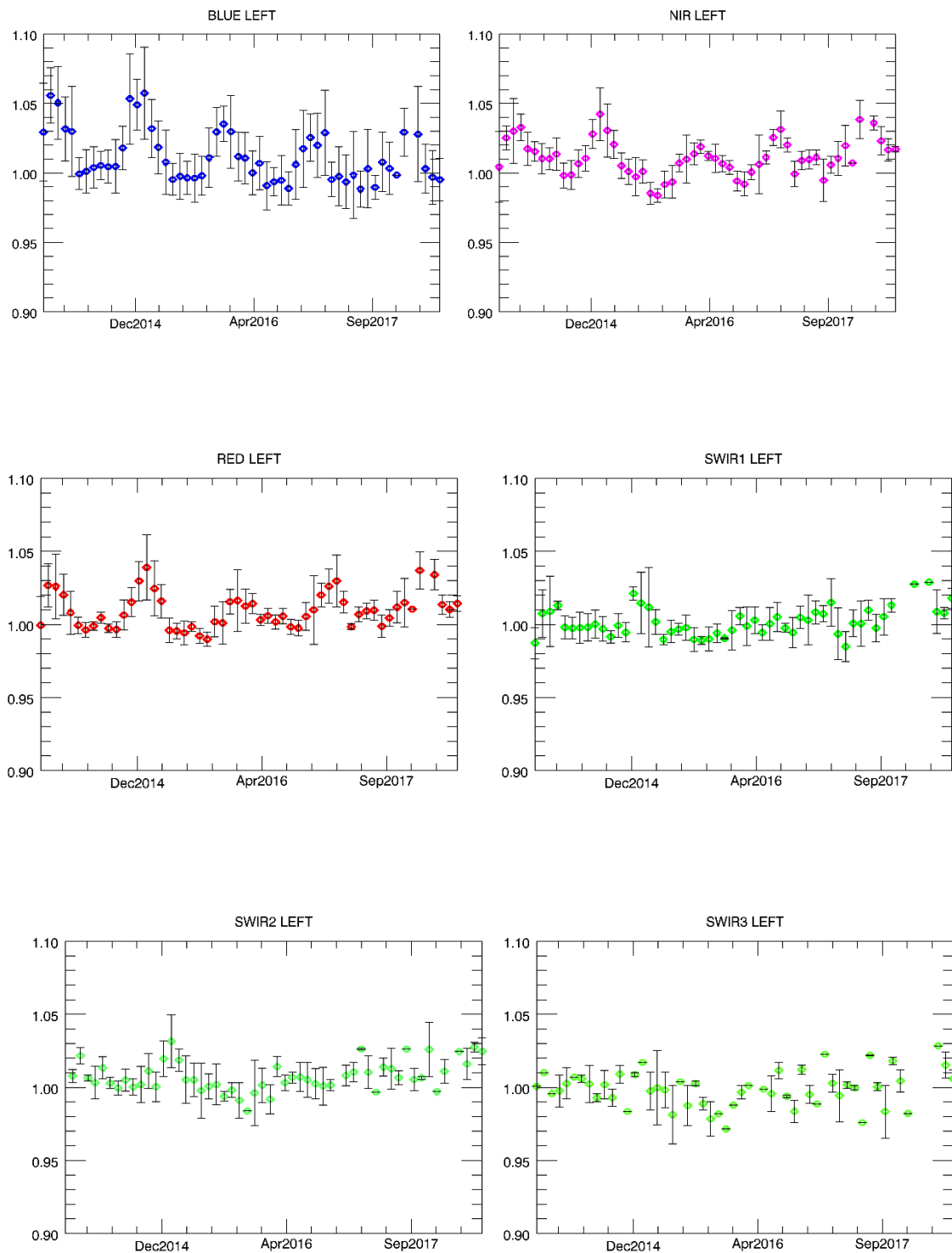


Figure 1. Libya-4 desert calibration results: LEFT monthly averaged results (collection 1)

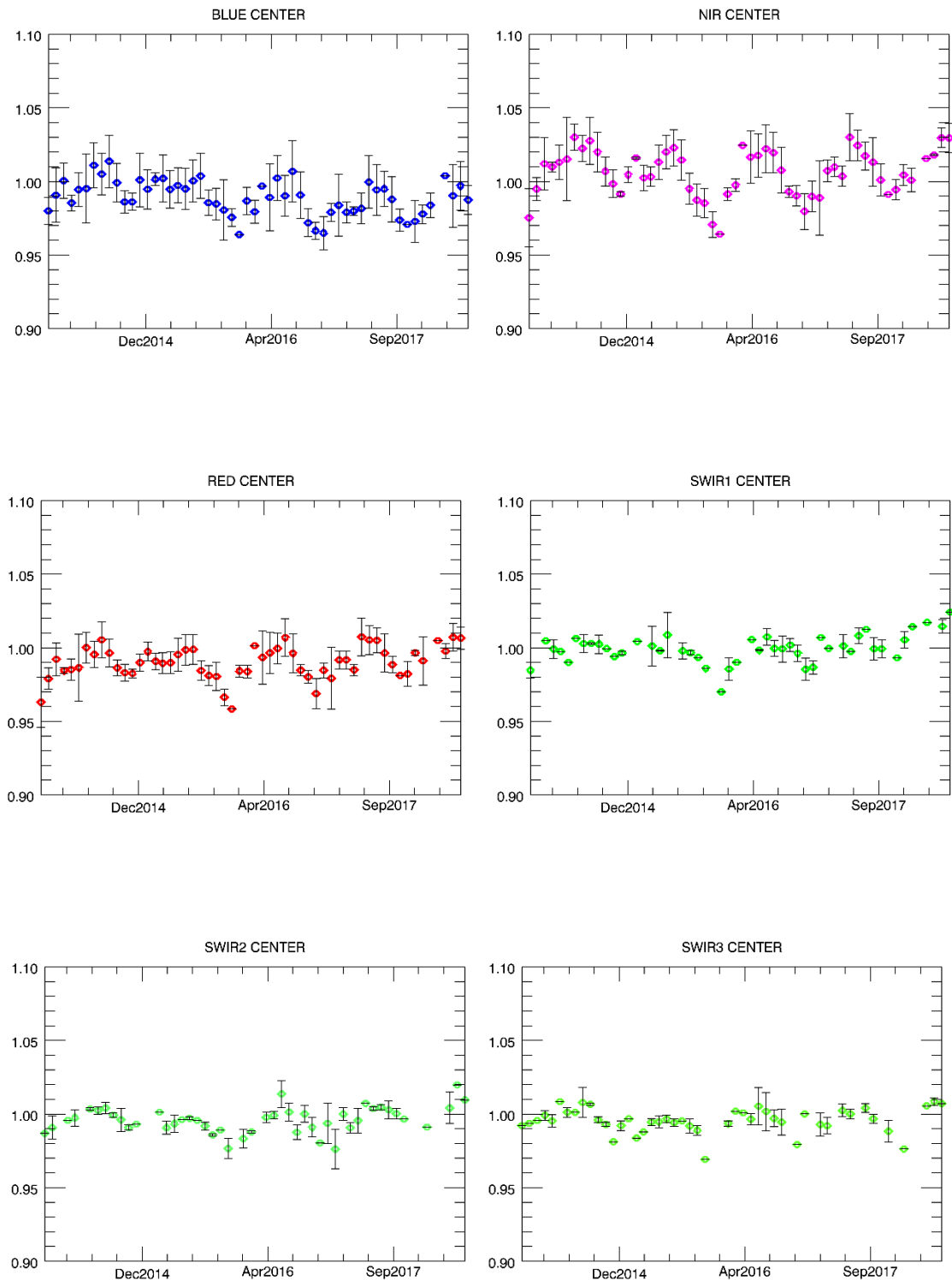


Figure 2. Libya-4 desert calibration results: CENTER monthly averaged results (collection 1)

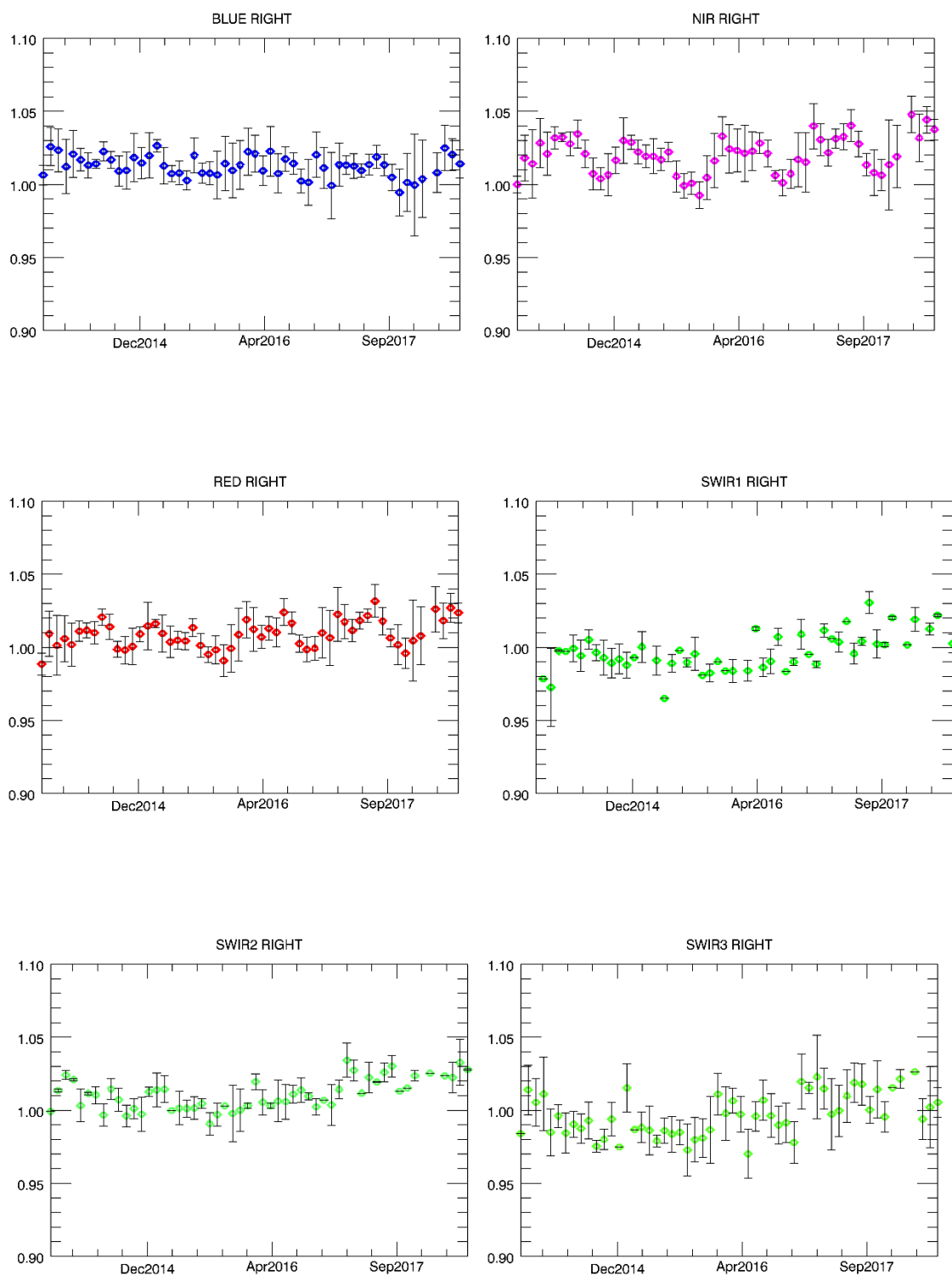


Figure 3. Libya-4 desert calibration results: RIGHT monthly averaged results (collection 1)

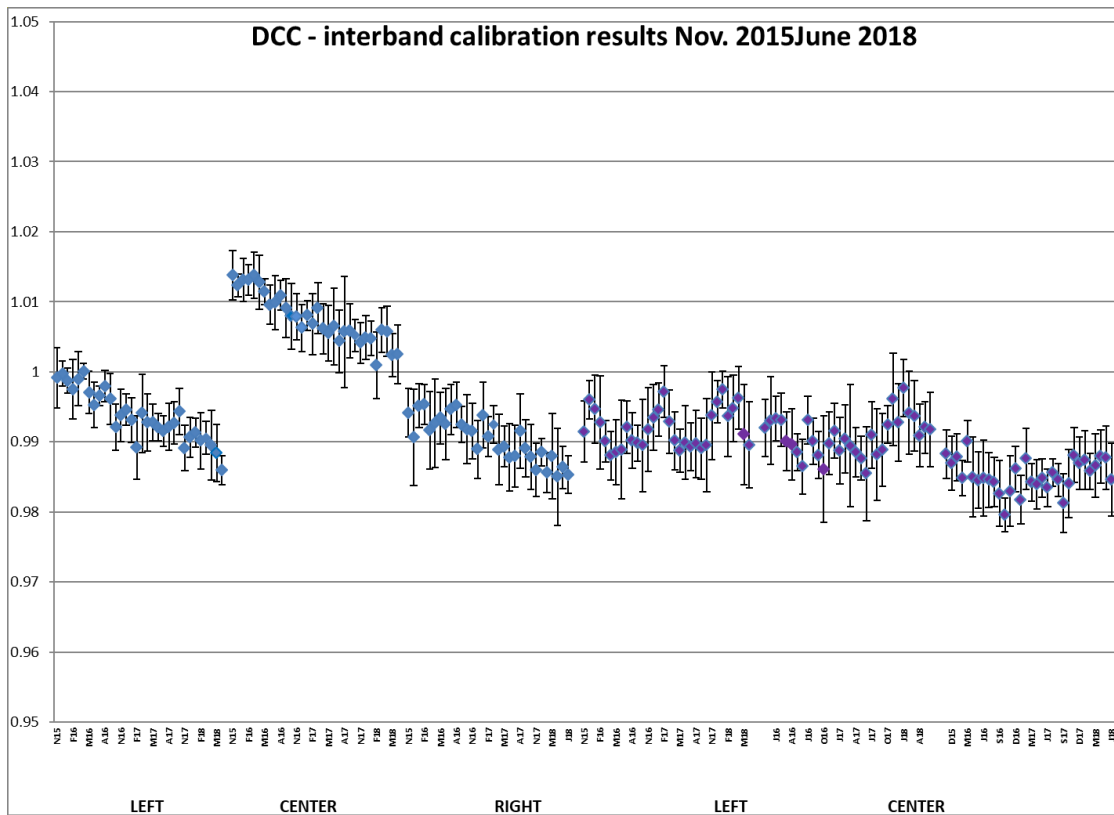


Figure 4. DCC inter-band calibration results: LEFT, CENTER and RIGHT camera (collection 1)

4.2. Geometric Calibration

Calibration image type	Total	Processed	Error
PROBA-V_L1C_INTERSECTION	14286	14286	0

Table13: Processed calibration images for this reporting period

During the reporting period, the average ALE was < 71 m (σ < 94 m). The daily ALE evolution (see Figure 5) shows the usual fluctuations, without any major ALE peaks. The highest value occurred on 6/6, with values of 69 – 81 m.

The average compliancy was 99.31% (98.89 – 99.73% from BLUE to SWIR) and the daily compliancy evolution showed the normal coinciding minima with high ALE values.

Geometric ICP file

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

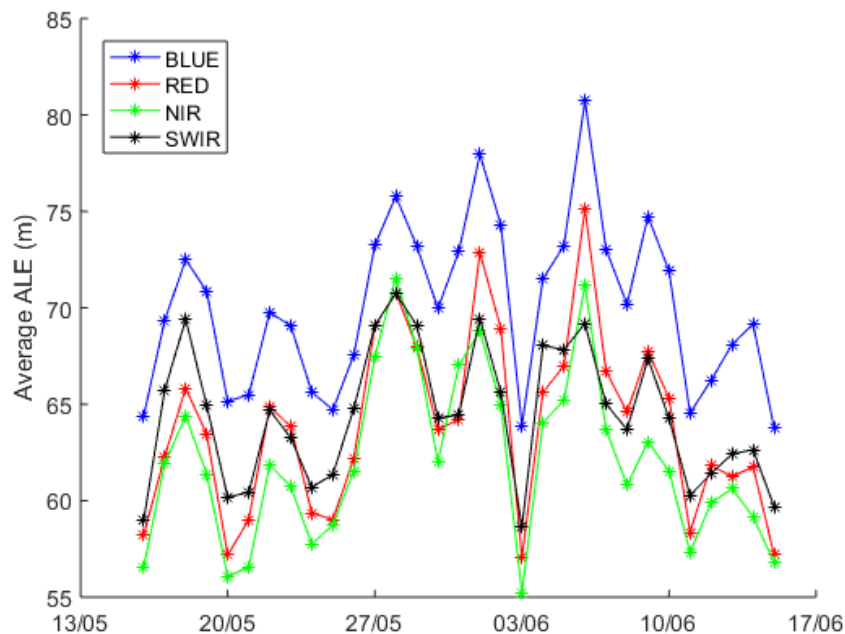


Figure 5 - Daily ALE evolution for 16/5/2018 – 15/6/2018

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 issues are resolved but remain to be closed formally
1 issues are resolved but remain in the list logging purposes
7 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 km ² (missing TFF))	0	
Large Gaps (< 21600 km ²)	0	
Medium Gaps (< 10000 km ²)	0	
Minor Gaps (< 3600 km ²)	5	08/06, 29/05, 30/05, 04/06, 14/06
Negligible Gaps (< 1000 km ²)	20	13/06, 03/06, 24/05, 19/05, 09/06, 15/06, 21/05, 26/05, 05/06, 31/05, 17/05, 22/05, 01/06, 06/06, 11/06, 23/05, 02/06, 28/05, 07/06, 12/06
Complete synthesis (no gaps)	6	16/05, 10/06, 27/05, 20/05, 25/05, 18/05

Table14: Overview of S1 for this reporting period

Synthesis	Missing	Decom. Error	Geom. Error	Missing TFF	Autom. Recovery	VC4 Missing	Create Contours	Other
20180516	0.30%							
20180517	0.37%	2						
20180518	0.00%							
20180519	0.01%	1	3					
20180520	0.00%							
20180521	0.34%	2	1					
20180522	0.06%		5					
20180523	0.01%	1	3					
20180524	0.01%	2						
20180525	0.22%							
20180526	1.36%	2						
20180527	0.00%							
20180528	2.17%	1	1					
20180529	0.55%	4	4					
20180530	1.18%	2	1				2	
20180531	1.53%	2	3					
20180601	0.01%	2						
20180602	0.02%	2	6					
20180603	0.51%		6					
20180604	4.30%	3	17		1			
20180605	1.37%	1	20					
20180606	0.01%	2	3					
20180607	0.01%	1	3					
20180608	1.55%	1	2		1		1	
20180609	0.03%	3	3					
20180610	0.00%							
20180611	0.00%		2					
20180612	0.16%	3	6					
20180613	0.30%	2						
20180614	1.89%	3	10		1			
20180615	0.02%	3	4					

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 new developments planned
- No other activities scheduled.

7. Operational remarks

No operational remarks