MONTHLY OPERATIONS REPORT

MOR#062

Reporting period from 16-Jan-2019 to 15-Feb-2019

DOCUMENT CONTROL

Signatures

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1. Summary

In this reporting period, the majority of the the synthesis products were nearly complete. Most impact on products was due to geometric errors or an automatic recoveries. Four TFFs were missing the past month.

Due to the high amount of geometric errors and the impact on the end-products, a further assessment was done on the logging. Preliminary conclusion is that the rate geometric distortion is higher in the winter months, especially in the pitch direction. This is to be clarified further and investigated. Also, most geometric distortion levels are just measured over the 150 m threshold, in which the processing workflows mark this data as no data, triggering a geometric error flag.

Due to the Antarctica acquisitions the instrument temperature has significantly increased from about about -3° in October 2018 to 2° . Since then an increase in then NIR band DCC calibration results of about 1.5% is observed. This increase is also visible, but less pronounced, in the Libya-4 desert results and the lunar calibration results. As there is no temperature dependent radiometric calibration model (except for the dark current), the absolute calibration coefficients are currently not adapted for this increase in temperature. It is expected that once the Antarctica acquisitions are finished, currently planned until end of February 2019, the calibration results will decrease again.

Preparations are ongoing to test e preliminary new cloud detection algorithm in acceptance environment.

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	306	4[*]	306

Table 2: Ingested and archived products for this reporting period

[*] TFF19551: Wrong pass times in use. TFF19579: Lost pass due to antenna issue; TFF 19691: No DCR file available; TFF 19830: Still under investigation by SSC

3.2. Generated and archived products

Product Type	Total	Processed	Error	Archived
PROBAV_L1A - Calibration	250	250	0	250
PROBAV_L1A - Nominal	2530	2524	6[*]	2529
PROBAV_L1C	2524	2524	0	2524
PROBAV_L2A_100M	880	880	0	880
PROBAV_L2A_300M	2524	2524	0	2524
PROBAV_L2A_1KM	2524	2524	0	2524
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

[*] 3 x L1A error due to Geometric processing; 3 x Error generating L1A

3.3. Backup and archiving service

Product type	Total Files	Total File Size (GB)
TFF	300	825.72
L1A	3118	1517.58
Database transaction logs	768	72.26
Database incremental back-up	40	6.67
Database full back-up	9	440.22

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

Product type	Total Files	Total File Size (GB)
PROBAV_TRANSFERFRAMES	306	916.25
PROBAV_L1A	2767	1493.33
PROBAV_L1C	2516	2936.65
PROBAV_L2A_100M	1769	1498.23
PROBAV_L2A_300M	5035	783.70
PROBAV_L2A_1KM	5038	102.90
PROBAV_L3_S1_TOA_100M	62	1580.24
PROBAV_L3_S1_TOC_100M	63	1363.62
PROBAV_L3_S1_TOC_NDVI_100M	62	149.53
PROBAV_L3_S5_TOA_100M	12	1179.76
PROBAV_L3_S5_TOC_100M	12	1071.53
PROBAV_L3_S5_TOC_NDVI_100M	12	114.80
PROBAV_L3_S1_TOA_300M	62	731.35
PROBAV_L3_S1_TOC_300M	62	655.53
PROBAV_L3_S10_TOC_300M	6	115.34
PROBAV_L3_S10_TOC_NDVI_300M	6	9.36
PROBAV_L3_S1_TOA_1KM	62	97.18
PROBAV_L3_S1_TOC_1KM	62	87.76
PROBAV_L3_S10_TOC_1KM	6	15.50
PROBAV_L3_S10_TOC_NDVI_1KM	6	1.17
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	2516	1	147
PROBAV_L2A_100M	879	896	901
PROBAV_L2A_300M	2516	16	499
PROBAV_L2A_1KM	2516	0	2
PROBAV_L3_S1_TOA_100M	31	45	31
PROBAV_L3_S1_TOC_100M	31	4156	1142
PROBAV_L3_S1_TOC_NDVI_100M	31	557	521
PROBAV_L3_S5_TOA_100M	6	2	96
PROBAV_L3_S5_TOC_100M	6	396	555
PROBAV_L3_S5_TOC_NDVI_100M	6	392	591
PROBAV_L3_S1_TOA_300M	31	77	77
PROBAV_L3_S1_TOC_300M	31	679	728
PROBAV_L3_S10_TOC_300M	3	234	235
PROBAV_L3_S10_TOC_NDVI_300M	3	115	120
PROBAV_L3_S1_TOA_1KM	31	67	69
PROBAV_L3_S1_TOC_1KM	31	100	135
PROBAV_L3_S10_TOC_1KM	3	30	37
PROBAV_L3_S10_TOC_NDVI_1KM	3	894	900

Table 6: Ordered and delivered products for this reporting period

3.5. End-user activity

20 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 **1578** with **119** different nationalities representing **1173** different companies/universities.

Product type	Africa	Asia	Europe	N-America	Oceania	S-America
PROBAV_L1C	0	175.05	10.48	0	0	0
PROBAV_L2A_100M	0.01	0	75.71	0	0.58	0.44
PROBAV_L2A_300M	0	0.13	129.26	0	0	0
PROBAV_L2A_1KM	0	0.01	0.01	0	0	0
PROBAV_L3_S1_TOA_100M	0	0	2.42	0	0.03	0
PROBAV_L3_S1_TOC_100M	1.29	22.68	808.67	444.83	0	0
PROBAV_L3_S1_TOC_NDVI_100M	0.01	3.53	0.60	0	0	0.21
PROBAV_L3_S5_TOA_100M	0	0	115.57	0	0	0.00
PROBAV_L3_S5_TOC_100M	25.88	134.34	333.39	20.70	0	1305.86

PROBAV_L3_S5_TOC_NDVI_100M	0.01	617.20	108.84	0	0	8.28
PROBAV_L3_S1_TOA_300M	0	1.20	628.29	0	0	0
PROBAV_L3_S1_TOC_300M	2.10	0	709.06	228.21	0	0
PROBAV_L3_S10_TOC_300M	2.66	0.74	167.18	0	0	0
PROBAV_L3_S10_TOC_NDVI_300M	12.91	0.52	0.13	0	0	0.03
PROBAV_L3_S1_TOA_1KM	0	1.50	91.82	0	0	0
PROBAV_L3_S1_TOC_1KM	0	0.77	157.72	0	0	0
PROBAV_L3_S10_TOC_1KM	0.63	0.92	24.29	8.27	0	0
PROBAV_L3_S10_TOC_NDVI_1KM	0.48	25.42	41.99	0	0	0.01

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

Product Type	Global
L1C	185.53
PROBAV_L2A_100M	76.74
PROBAV_L2A_300M	129.39
PROBAV_L2A_1KM	0.02
PROBAV_L3_S1_TOA_100M	2.46
PROBAV_L3_S1_TOC_100M	1277.47
PROBAV_L3_S1_TOC_NDVI_100M	4.35
PROBAV_L3_S5_TOA_100M	115.58
PROBAV_L3_S5_TOC_100M	1820.18
PROBAV_L3_S5_TOC_NDVI_100M	734.33
PROBAV_L3_S1_TOA_300M	629.49
PROBAV_L3_S1_TOC_300M	939.37
PROBAV_L3_S10_TOC_300M	170.59
PROBAV_L3_S10_TOC_NDVI_300M	13.59
PROBAV_L3_S1_TOA_1KM	93.32
PROBAV_L3_S1_TOC_1KM	158.50
PROBAV_L3_S10_TOC_1KM	34.11
PROBAV_L3_S10_TOC_NDVI_1KM	67.90

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

Company	# Downloads
N/A	1027
UNIVERSITY OF OSLO	881
VITO	598
IGSNRR	553
UNIVERSIDAD DE VALENCIA	478
HKBU	435
AGROWING	423
VUB	395
AVIA-GIS	360
TECHNISCHE UNIVERSITÄT DRESDEN	215

Table 9: Top 10 user companies for the reporting period

Country	# Users
CHINA	160
BELGIUM	133
FRANCE	75
BRAZIL	71
UNITED STATES	71
INDIA	71
ITALY	68
UNITED KINGDOM	56
NETHERLANDS	53
GERMANY	50

Table 10: Top 10 countries with most registered users

List of issues raised by users:

- Problem connecting to MEP VM with x2go
- RE: Proba-V MEP: UserVM server change
- yarn wil niet stoppen (hspf)
- [user: j_leon] issue with File Manager
- issues with missing package
- PDF: N.A. - Mahammed Endrias - 2019/2/8
- FW: Mounts on MEP
- [user: j_leon] cannot login
- PDF: N.A. - Alena Shagnieva - 2019/2/1
- DAG sa_lai_fapar_probav werkt niet meer sinds upgrade airflow
- Your submission to the PROBA-V helpdesk
- Unable to connect to http://airflow-c3s-dev.vgt.vito.be:8080/admin/
- PDF: (API) - cwirion - 2019/1/29 - PROBA-V Mission Exploitation Platform - Error connecting to ProbaVMEP
- DAG start niet meer

- mounts weg
- ssh mep VM
- Jupyter notebooks not identically configured as the cluster?
- question about PROBA-V image calendar
- PDF: N.A. - ipek Temel - 2019/1/24 - password
- FW: [PROBLEM] disks on airflow-gmgit-acc is WARNING!
- No Copernicus metadata in PROBAV products since the New Year
- PDF: (API) - Parde mickael - 2019/1/23 - PROBA-V Mission Exploitation Platform - Proba-V MEP Virtual Machine access
- Status user VM
- Geen log file beschikbaar voor job application_1547717732157_0485
- PROBA-V 2019 Calendar
- PROBA-V calendar 2019
- Niet meer rekenen
- Notebookserver is down

4. Image Calibration services

4.1. Radiometric Calibration

Calibration request type	Total	Processed	Not received	Error
CLOUDS	16	16	0	0
DARK CURRENT	21	21	0	0
MOON	2	2	0	0
RAYLEIGH	47	45	2	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	1	1
PROBA-V_L1B_CALIBRATION	248	182	66
PROBA-V_L1B_INTERSECTION	769	351	418
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.

Due to the Antarctica acquisitions the **instrument temperature has significantly increased** from about about -3° in October 2018 to 2° . **Since then an increase in then NIR band DCC calibration results of about 1.5% is observed**. This increase is also visible, but less pronounced, in the Libya-4 desert results and the lunar calibration results. As there is no temperature dependent radiometric calibration model (except for the dark current), the absolute calibration coefficients are currently not adapted for this increase in temperature. It is expected that once the Antarctica acquisitions are finished, the calibration results will decrease again .

Radiometric ICP file

The BLUE LEFT/CENTER absolute calibration coefficients will be updated following a linear degradation model. No updates will be performed for the SWIR strips. Furthermore the dark currents will be updated.

The current ICP files are :

- PROBAV_ICP_RADIOMETRIC#LEFT_20190201_V01
- PROBAV_ICP_RADIOMETRIC#CENTER_20190201_V01
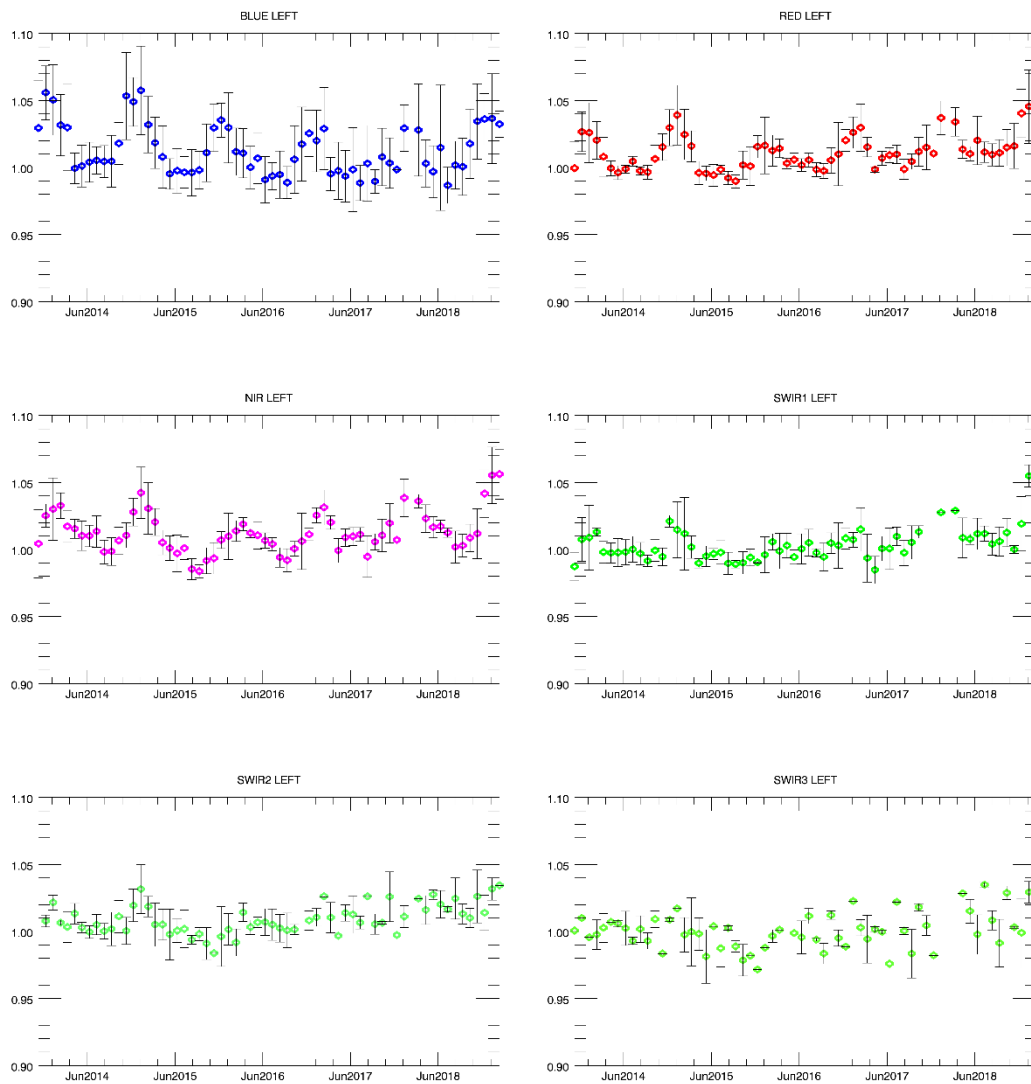- PROBAV_ICP_RADIOMETRIC#RIGHT_20190201_V01

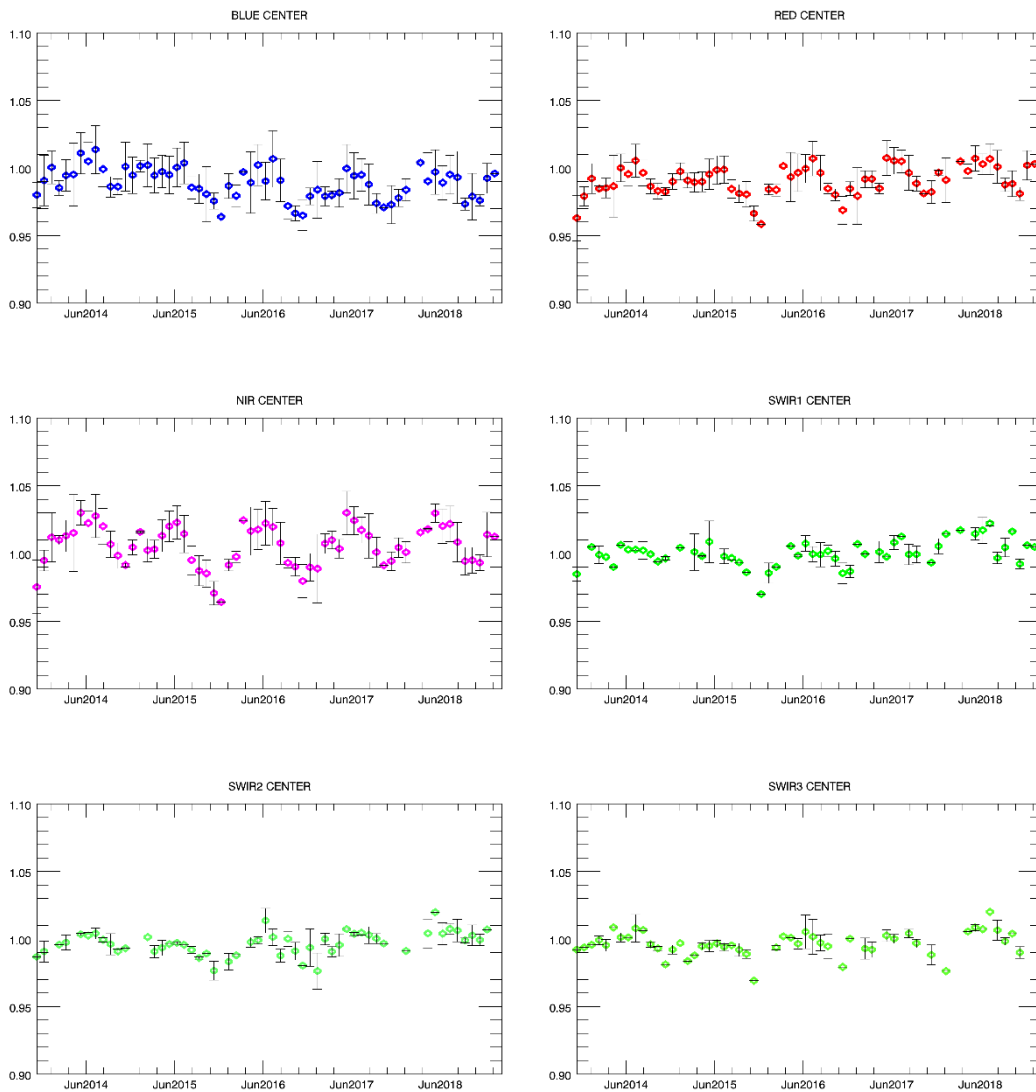*Figure 1. Libya-4 desert calibration results: LEFT monthly averaged results (collection 1)*

Figure 2. Libya-4 desert calibration results: CENTER monthly averaged results (collection 1)
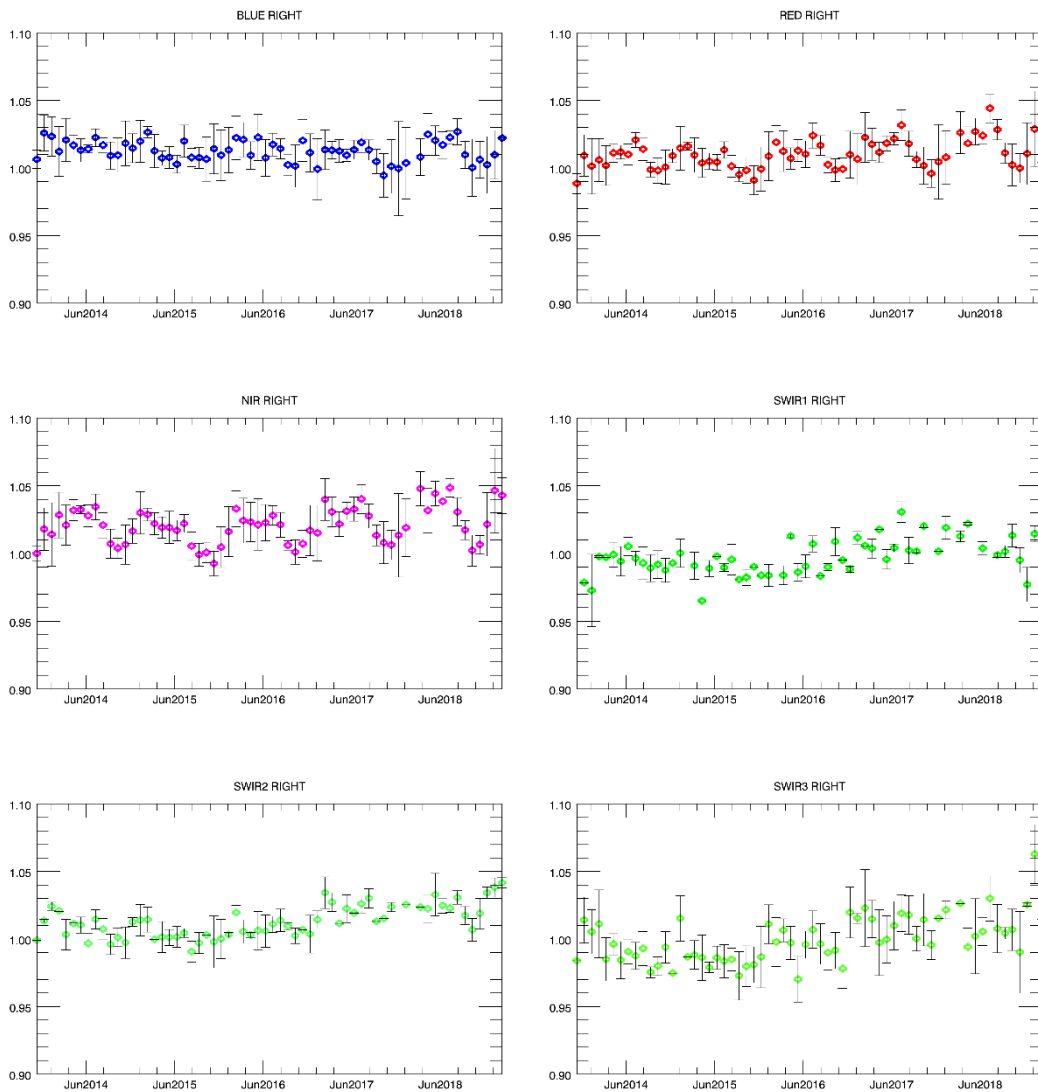
Figure 3. Libya-4 desert calibration results: RIGHT monthly averaged results (collection 1)
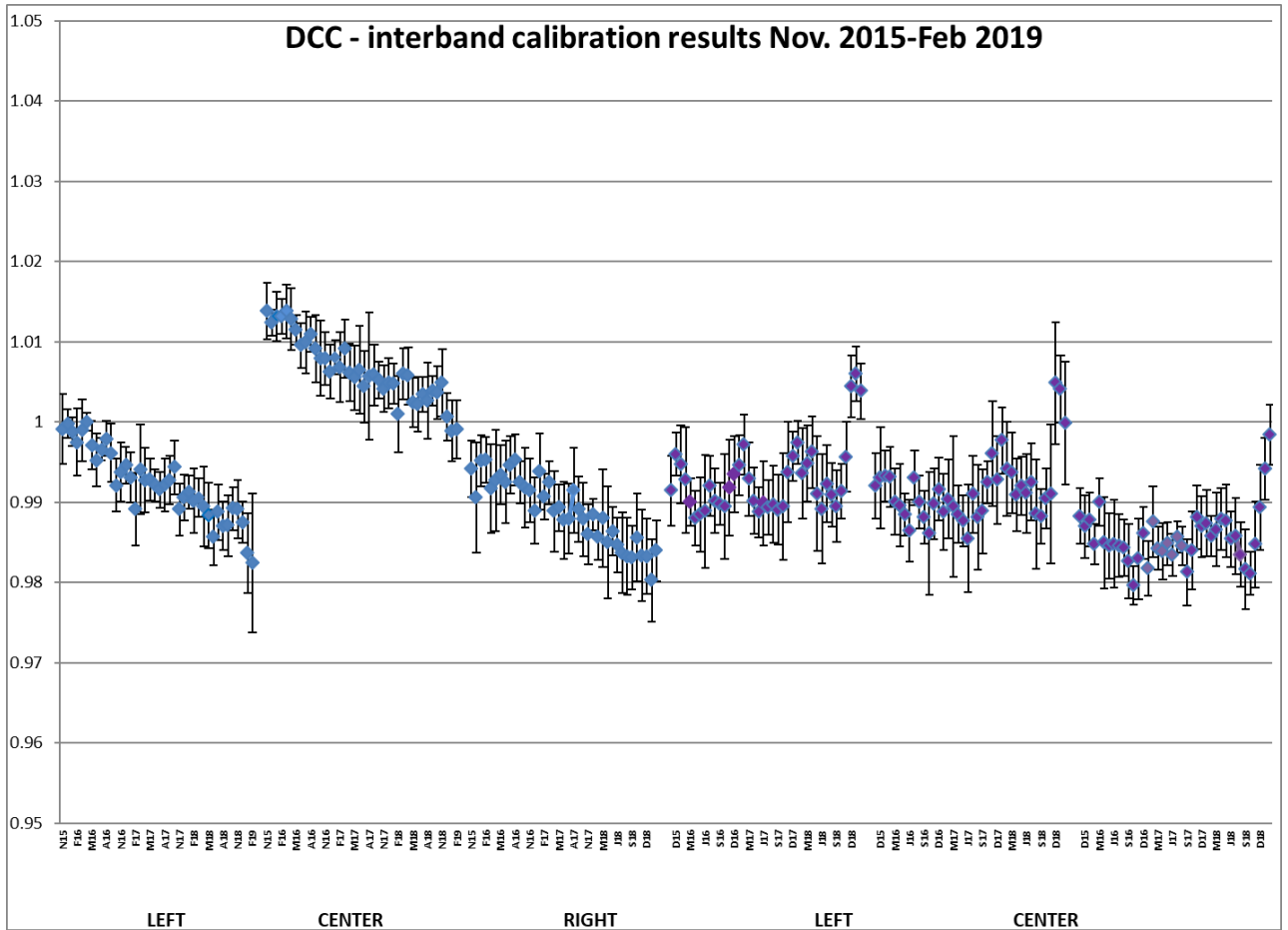
Figure 4. DCC inter-band calibration results: LEFT, CENTER and RIGHT camera (collection 1)

4.2. Geometric Calibration

Calibration image type	Total	Processed	Error
PROBA-V_L1C_INTERSECTION	13908	13908	0

Table13: Processed calibration images for this reporting period

Unfortunately, no ALE values were available for the last 3 days of the reporting period (13 – 15/2). During the previous month, the average ALE was < 78 m (σ < 96 m). At the beginning of the reporting period, ALE values were high, with values of 97 – 115 m on 16/1. This peak was followed by a rapid decrease to values of ~60 – 80 m throughout the largest part of the month. At the end of the reporting period, values increased again to 75 – 95 m on 12/2.

The average compliance was 99.24% (98.63 – 99.72% for BLUE – SWIR). Minimum compliance values occurred on 16/1 and were 97.52 – 99.60% for BLUE – SWIR.

Geometric ICP file

The current geometric IPC files are:

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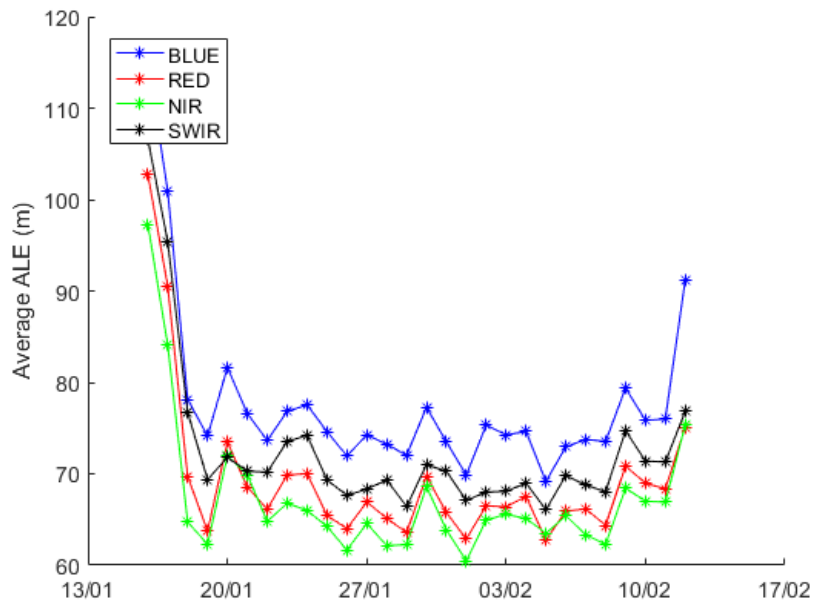- PROBAV_ICP_GEOMETRIC#RIGHT_20160907_V01

Figure 5. Daily ALE for period 16/01/2019 to 13/02/2019

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 issues were 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 issues 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:

	# S1	Dates
Major Gaps (> 21600 km² (missing TFF))	1	13/02
Large Gaps (< 21600 km²)	2	16/01, 04/02
Medium Gaps (< 10000 km²)	3	28/01, 19/01, 30/01
Minor Gaps (< 3600 km²)	5	23/01, 15/02, 31/01, 22/01, 14/02
Negligible Gaps (< 1000 km²)	20	12/02, 18/01, 02/02, 07/02, 01/02, 11/02, 06/02, 17/01, 27/01, 21/01, 26/01, 05/02, 10/02, 29/01, 03/02, 08/02, 24/01, 09/02, 25/01, 20/01
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
20190116	2.95%	7	17	1			2	
20190117	0.64%	7	21					
20190118	0.52%	5	27					
20190119	6.56%	6	19	1				
20190120	1.10%	9	14					
20190121	5.07%	7	23				2	
20190122	5.39%	9	21		1			
20190123	7.44%	8	23		1			
20190124	4.25%	3	28					
20190125	4.39%	12	45					
20190126	3.30%	10	58					
20190127	3.28%	5	51					
20190128	7.68%	9	46					
20190129	2.94%	6	2					
20190130	4.09%	10	33		1	1	2	
20190131	5.93%	4	35	1		1	1	
20190201	6.54%	4	32					
20190202	6.67%	7	43					
20190203	6.23%	8	33					
20190204	11.58%	11	32		2		1	
20190205	4.38%	12	32					
20190206	3.83%	9	27					
20190207	3.39%	10	9					
20190208	2.86%	6	8					
20190209	1.44%	5	23					
20190210	1.71%	14	24			1		
20190211	8.45%	9	28					
20190212	7.84%	7	39					
20190213	8.08%	7	28	1		1		
20190214	5.91%	11	20			1		
20190215	8.28%	19	8					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 acceptance environment to test the new cloud detection algorithm is being prepared.

- No other activities scheduled.

7. Operational remarks

No operational remarks