MONTHLY OPERATIONS REPORT

MOR#025

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

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Date: 19/01/2016
DOCUMENT CONTROL

Signatures

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

Issuing authority

Change record

<table>
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<th>Date</th>
<th>Pages</th>
<th>Description</th>
<th>Editor(s)/Reviewer(s)</th>
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<td>19/01/2016</td>
<td>All</td>
<td>Initial version</td>
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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 download 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

<table>
<thead>
<tr>
<th>Category</th>
<th>% Up Time</th>
<th>% Down Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switches</td>
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<td>0.0</td>
</tr>
<tr>
<td>Database Servers</td>
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<td>0.0</td>
</tr>
<tr>
<td>Mid Term File Servers</td>
<td>100.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Short Term File Servers</td>
<td>100.0</td>
<td>0.0</td>
</tr>
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<td>Master Servers</td>
<td>100.0</td>
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<td>Worker Nodes</td>
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<tr>
<td>PDF</td>
<td>99.98</td>
<td>0.02(*)</td>
</tr>
</tbody>
</table>

\(^{(*)}\) Pnodes 30 to 33 registered some downtime
3. Image Processing Services

3.1. Ingested and archived products

<table>
<thead>
<tr>
<th>Product Type</th>
<th>Total</th>
<th>Received</th>
<th>Missing data, ingested by VITO</th>
<th>Archived</th>
</tr>
</thead>
<tbody>
<tr>
<td>METEO</td>
<td>248</td>
<td>248</td>
<td>248</td>
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<tr>
<td>TFF</td>
<td>311</td>
<td>309</td>
<td>2(*)</td>
<td>309</td>
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</table>

*Table 2: Ingested and archived products for this reporting period*

(*) 2 x TFF missing (TFF08531, TFF08536)

3.2. Generated and archived products

<table>
<thead>
<tr>
<th>Product Type</th>
<th>Total</th>
<th>Processed</th>
<th>Error</th>
<th>Archived</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROBAV_L1A - Calibration</td>
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<td>341</td>
<td>341</td>
<td></td>
</tr>
<tr>
<td>PROBAV_L1A - Nominal</td>
<td>2525</td>
<td>2522</td>
<td>3(*)</td>
<td>2524</td>
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<tr>
<td>PROBAV_L1C</td>
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<td>2522</td>
<td>2522</td>
<td></td>
</tr>
<tr>
<td>PROBAV_L3_S1_TOA_100M</td>
<td>31</td>
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<td>31</td>
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<tr>
<td>PROBAV_L3_S1_TOC_100M</td>
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<td>31</td>
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</tr>
<tr>
<td>PROBAV_L3_S1_TOA_300M</td>
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<td>31</td>
<td>31</td>
<td></td>
</tr>
<tr>
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<td>31</td>
<td>31</td>
<td>31</td>
<td></td>
</tr>
<tr>
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<td>3</td>
<td>3</td>
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<tr>
<td>PROBAV_L3_S10_TOC_NDVI_300M</td>
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<td>3</td>
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</tr>
<tr>
<td>PROBAV_L3_S1_TOA_1KM</td>
<td>31</td>
<td>31</td>
<td>31</td>
<td></td>
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<tr>
<td>PROBAV_L3_S1_TOC_1KM</td>
<td>31</td>
<td>31</td>
<td>31</td>
<td></td>
</tr>
<tr>
<td>PROBAV_L3_S10_TOC_1KM</td>
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<td>3</td>
<td>3</td>
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</tr>
<tr>
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<td>3</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

*Table 3: Generated and archived products for this reporting period*

(*) 3 x L1A error: 1 due to a geometric error, 1 due to a missing TFF file, 1 cause is still under investigation.
### 3.3. Backup and archiving service

<table>
<thead>
<tr>
<th>Product type</th>
<th>Total Files</th>
<th>Total File Size (GB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TFF</td>
<td>301</td>
<td>718.85</td>
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<tr>
<td>L1A</td>
<td>2770</td>
<td>1276.22</td>
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<tr>
<td>Database transaction logs</td>
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<tr>
<td>Database incremental back-up</td>
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<tr>
<td>Database full back-up</td>
<td>33</td>
<td>724.29</td>
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</table>

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

<table>
<thead>
<tr>
<th>Product type</th>
<th>Total Files</th>
<th>Total File Size (GB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROBAV_TRANSFERFRAMES</td>
<td>289</td>
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<td>PROBAV_L1A</td>
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<td>PROBAV_L1C</td>
<td>2352</td>
<td>2577.03</td>
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<td>PROBAV_L3_S1_TOA_100M</td>
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<tr>
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<td>POLARMOTION</td>
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*Table 5: Archived data volumes for this reporting period*
### 3.4. Dissemination service

<table>
<thead>
<tr>
<th>Product type</th>
<th>Added to catalogue</th>
<th>Ordered</th>
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<td>220</td>
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<td>909</td>
<td>689</td>
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<td>344</td>
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<td>3</td>
<td>195</td>
<td>217</td>
</tr>
</tbody>
</table>

*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.

<table>
<thead>
<tr>
<th>Product type</th>
<th>Africa</th>
<th>Asia</th>
<th>Europe</th>
<th>N-America</th>
<th>Oceania</th>
<th>S-America</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROBAV_L1C</td>
<td>342.51</td>
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<td></td>
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<td></td>
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<td></td>
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</tr>
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<td></td>
<td></td>
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</tr>
<tr>
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<td>13.43</td>
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<td></td>
<td></td>
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<td>199.80</td>
</tr>
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</table>
Table 7: Data download (GB) in total per Origin of the User for the reporting period

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

Table 7: Data download (GB) in total for the reporting period

<table>
<thead>
<tr>
<th>Product Type</th>
<th>Global</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1C</td>
<td>342.51</td>
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<td>PROBAV_L3_S1_TOA_100M</td>
<td>668.09</td>
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<td>1507.32</td>
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<td>4.16</td>
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Table 8: 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

<table>
<thead>
<tr>
<th>Calibration request type</th>
<th>Total</th>
<th>Processed</th>
<th>Not received</th>
<th>Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLOUDS</td>
<td>13</td>
<td>13</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>DARK CURRENT</td>
<td>20</td>
<td>19</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>MOON</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>RAYLEIGH</td>
<td>40</td>
<td>39</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>SNOW</td>
<td>41</td>
<td>41</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>SUN_GLINT</td>
<td>14</td>
<td>14</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

*Table 11: Calibration Image requests for this reporting period*

<table>
<thead>
<tr>
<th>Calibration image type</th>
<th>Total</th>
<th>Valid</th>
<th>Invalid</th>
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</thead>
<tbody>
<tr>
<td>PROBA_V_L1A_CALIBRATION</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>PROBA-V_L1B_CALIBRATION</td>
<td>286</td>
<td>207</td>
<td>40</td>
</tr>
<tr>
<td>PROBA-V_L1B_INTERSECTION</td>
<td>621</td>
<td>277</td>
<td>344</td>
</tr>
<tr>
<td>PROBA-V_L1B_OVERLAPREGION</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

*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
4.2. Geometric Calibration

<table>
<thead>
<tr>
<th>Calibration image type</th>
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<th>Processed</th>
<th>Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROBA-V_L1C_INTERSECTION</td>
<td>13296</td>
<td>13296</td>
<td></td>
</tr>
</tbody>
</table>

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](http://jira.vgt.vito.be)

<table>
<thead>
<tr>
<th>Key</th>
<th>Summary</th>
<th>Status</th>
<th>Created</th>
<th>Component/s</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROBAVUS-7</td>
<td>Very small images fail to process</td>
<td>Resolved</td>
<td>10/01/2014</td>
<td>General</td>
</tr>
</tbody>
</table>

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](https://juniper.vgt.vito.be/ciptools)

The below table gives an overview of the S1’s of this reporting period:

<table>
<thead>
<tr>
<th></th>
<th># S1</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major Gaps (&gt; 21600 km² (missing TFF))</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Large Gaps (&lt; 21600 km²)</td>
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<td></td>
</tr>
<tr>
<td>Medium Gaps (&lt; 10000 km²)</td>
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<td>13/01, 24/12, 01/01, 11/01, 12/01, 20/12, 25/12, 15/01</td>
</tr>
<tr>
<td>Minor Gaps (&lt; 3600 km²)</td>
<td>2</td>
<td>03/01, 31/12</td>
</tr>
<tr>
<td>Negligible Gaps (&lt; 1000 km²)</td>
<td>21</td>
<td>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</td>
</tr>
<tr>
<td>Complete synthesis (no gaps)</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

*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.