MONTHLY OPERATIONS REPORT

MOR#012

Reporting period from 16/11/2014 to 15/12/2014

Reference: PROBA-V_D6_MOR-012_2014-12_v1.0
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Version: 1.0
Date: 18/12/2014
DOCUMENT CONTROL

Signatures

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Issuing authority

Change record

<table>
<thead>
<tr>
<th>Release</th>
<th>Date</th>
<th>Pages</th>
<th>Description</th>
<th>Editor(s)/Reviewer(s)</th>
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<td>1.0</td>
<td>18/12/2014</td>
<td>All</td>
<td>Initial version</td>
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</tbody>
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1. Summary

In the past month 7 TFFs were not received. Four TFF’s were not received due to the platform being in ‘safe mode’ on 27/11. In total 20 x S1’s were incomplete; 1 shows a major gap, 2 a large gap, 3 show a medium gap, 14 a minor gap and 10 a negligible gap. 10 S1’s were complete without any anomalies.

No excesses in geometric and radiometric performance has been observed in this reporting period.

In this reporting period, a number of changes have been done to the Product Dissemination Platform. These have been implemented on November 20th. Stitching has been made available for all users and a number of changes have been done to improve the user experience on the PDF portal. In addition to this, a data pool has been added to give the users quick access to all available data on the PDF.

In the meanwhile, change requests EW-PV-EOP-006 and EW-PV-EOP-008 have been officially approved and will be developed and implemented in Q1/2015.

2. System Infrastructure

<table>
<thead>
<tr>
<th>Category</th>
<th>% Up Time</th>
<th>% Down Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switches</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>Database Servers</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>Mid Term File Servers</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>Short Term File Servers</td>
<td>99.98</td>
<td>0.02(*)</td>
</tr>
<tr>
<td>Master Servers</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>Worker Nodes</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>PDF</td>
<td>99.99</td>
<td>0.01(**)</td>
</tr>
</tbody>
</table>

* Table 1: System Infrastructure availability for this reporting period

(*) Due to power supply problems on PSTFS8-server
(**) Due to updates on the PDF-servers on November 20th
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>TFF</td>
<td>300</td>
<td>294</td>
<td>6</td>
<td>294</td>
</tr>
<tr>
<td>METEO</td>
<td>240</td>
<td>240</td>
<td></td>
<td>240</td>
</tr>
</tbody>
</table>

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

(*) 4 TFFs missing due to the platform being in Safe mode on November 20th, 1 due to baseband problems and one due to communication problems in Fairbanks DRS.

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>
<td>583</td>
<td>555</td>
<td>28(1)</td>
<td>580</td>
</tr>
<tr>
<td>PROBAV_L1A – Nominal</td>
<td>2316</td>
<td>2306</td>
<td>10(2)</td>
<td>2308</td>
</tr>
<tr>
<td>PROBAV_L1C</td>
<td>2306</td>
<td>2306</td>
<td></td>
<td>2305</td>
</tr>
<tr>
<td>PROBAV_L3_S1_TOA_1KM</td>
<td>30</td>
<td>30</td>
<td></td>
<td>30</td>
</tr>
<tr>
<td>PROBAV_L3_S1_TOA_333M</td>
<td>30</td>
<td>30</td>
<td></td>
<td>30</td>
</tr>
<tr>
<td>PROBAV_L3_S1_TOC_1KM</td>
<td>30</td>
<td>30</td>
<td></td>
<td>30</td>
</tr>
<tr>
<td>PROBAV_L3_S1_TOC_333M</td>
<td>30</td>
<td>30</td>
<td></td>
<td>30</td>
</tr>
<tr>
<td>PROBAV_L3_S10_TOC_1KM</td>
<td>3</td>
<td>3</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>PROBAV_L3_S10_TOC_333M</td>
<td>3</td>
<td>3</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>PROBAV_L3_S10_TOC_NDVI_1KM</td>
<td>3</td>
<td>3</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>PROBAV_L3_S10_TOC_NDVI_333M</td>
<td>3</td>
<td>3</td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

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

(*) 14 x “createcontours failed” error, 10 segments were not received on 27/11, 1 x geometric error and 3 failed due to missing aerosol data on 15/11

(**) 7 due to a decompression error, 3 segment failed due to missing platform data
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>291</td>
<td>681.98</td>
</tr>
<tr>
<td>L1A</td>
<td>2797</td>
<td>1181.57</td>
</tr>
<tr>
<td>Database transaction logs</td>
<td>944</td>
<td>56.46</td>
</tr>
<tr>
<td>Database incremental back-up</td>
<td>26</td>
<td>7.76</td>
</tr>
<tr>
<td>Database full back-up</td>
<td>38</td>
<td>518.44</td>
</tr>
</tbody>
</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>295</td>
<td>758.94</td>
</tr>
<tr>
<td>PROBAV_L1A</td>
<td>2891</td>
<td>1315.6</td>
</tr>
<tr>
<td>PROBAV_L1C</td>
<td>2315</td>
<td>2407.11</td>
</tr>
<tr>
<td>PROBAV_L3_S1_TOA_1KM</td>
<td>30</td>
<td>39.12</td>
</tr>
<tr>
<td>PROBAV_L3_S1_TOA_333M</td>
<td>30</td>
<td>266.72</td>
</tr>
<tr>
<td>PROBAV_L3_S1_TOC_1KM</td>
<td>30</td>
<td>39.99</td>
</tr>
<tr>
<td>PROBAV_L3_S1_TOC_333M</td>
<td>30</td>
<td>275.03</td>
</tr>
<tr>
<td>PROBAV_L3_S10_TOC_1KM</td>
<td>3</td>
<td>8.07</td>
</tr>
<tr>
<td>PROBAV_L3_S10_TOC_333M</td>
<td>3</td>
<td>58.96</td>
</tr>
<tr>
<td>PROBAV_L3_S10_TOC_NDVI_1KM</td>
<td>3</td>
<td>0.57</td>
</tr>
<tr>
<td>PROBAV_L3_S10_TOC_NDVI_333M</td>
<td>3</td>
<td>4.48</td>
</tr>
<tr>
<td>ICP_GEOMETRIC_CENTRE</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>ICP_GEOMETRIC_LEFT</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>ICP_GEOMETRIC_RIGHT</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>ICP_RADIOMETRIC_CENTRE</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>ICP_RADIOMETRIC_LEFT</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>ICP_RADIOMETRIC_RIGHT</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>METEO_ECMWF</td>
<td>232</td>
<td>0.29</td>
</tr>
<tr>
<td>METEO_METEOSERVICES</td>
<td>240</td>
<td>1.28</td>
</tr>
<tr>
<td>POLARMOTION</td>
<td>1</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>

*Table 5: Archived data volumes for this reporting period*
3.4. Dissemination service

<table>
<thead>
<tr>
<th>Product</th>
<th>Added to catalogue</th>
<th>Ordered</th>
<th>Delivered (*)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROBAV_L1C</td>
<td>2305</td>
<td>1363</td>
<td>1350</td>
</tr>
<tr>
<td>PROBAV_L3_S1_TOA_1KM</td>
<td>30</td>
<td>160</td>
<td>185</td>
</tr>
<tr>
<td>PROBAV_L3_S1_TOA_333M</td>
<td>30</td>
<td>212</td>
<td>210</td>
</tr>
<tr>
<td>PROBAV_L3_S1_TOC_1KM</td>
<td>30</td>
<td>406</td>
<td>435</td>
</tr>
<tr>
<td>PROBAV_L3_S1_TOC_333M</td>
<td>30</td>
<td>1345</td>
<td>1367</td>
</tr>
<tr>
<td>PROBAV_L3_S10_TOC_1KM</td>
<td>3</td>
<td>85</td>
<td>92</td>
</tr>
<tr>
<td>PROBAV_L3_S10_TOC_333M</td>
<td>3</td>
<td>287</td>
<td>328</td>
</tr>
<tr>
<td>PROBAV_L3_S10_TOC_NDVI_1KM</td>
<td>3</td>
<td>131</td>
<td>136</td>
</tr>
<tr>
<td>PROBAV_L3_S10_TOC_NDVI_333M</td>
<td>3</td>
<td>99</td>
<td>128</td>
</tr>
</tbody>
</table>

(*) If the delivered number is larger than the ordered number, some products are downloaded multiple times

Table 6: Ordered and delivered products for this reporting period

3.5. End-user activity

19 new users were registered in this reporting period.
The total number of users registered for PROBA-V data and that have ordered data is 276.

<table>
<thead>
<tr>
<th>Product</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>L1C</td>
<td>3770.64</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4.09</td>
</tr>
<tr>
<td>L3_S1_TOA_1KM</td>
<td>0.01</td>
<td>0.00</td>
<td>50.51</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L3_S1_TOC_1KM</td>
<td></td>
<td>386.72</td>
<td></td>
<td>0.23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L3_S10_TOC_1KM</td>
<td>0.01</td>
<td></td>
<td>307.61</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L3_S10_TOC_NDVI_1KM</td>
<td>0.11</td>
<td></td>
<td>401.87</td>
<td>0.08</td>
<td>2.35</td>
<td></td>
</tr>
<tr>
<td>L3_S1_TOA_333M</td>
<td>2.44</td>
<td></td>
<td>21.68</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L3_S1_TOC_333M</td>
<td>12.44</td>
<td></td>
<td>904.05</td>
<td></td>
<td></td>
<td>5.53</td>
</tr>
<tr>
<td>L3_S10_TOC_333M</td>
<td>0.27</td>
<td></td>
<td>8.61</td>
<td>0.53</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L3_S10_TOC_NDVI_333M</td>
<td>0.48</td>
<td></td>
<td>3.86</td>
<td>2.38</td>
<td>1.53</td>
<td></td>
</tr>
</tbody>
</table>

Table 7: Data download (GB) in total per Origin of the User for the reporting period
Table 8: Data download (GB) in total for this reporting period

<table>
<thead>
<tr>
<th>Global</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1C</td>
</tr>
<tr>
<td>L3_S1_TOA_1KM</td>
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<tr>
<td>L3_S1_TOC_1KM</td>
</tr>
<tr>
<td>L3_S10_TOC_1KM</td>
</tr>
<tr>
<td>L3_S10_TOC_NDVI_1KM</td>
</tr>
<tr>
<td>L3_S1_TOA_333M</td>
</tr>
<tr>
<td>L3_S1_TOC_333M</td>
</tr>
<tr>
<td>L3_10_TOC_333M</td>
</tr>
<tr>
<td>L3_S10_TOC_NDVI_333M</td>
</tr>
</tbody>
</table>

List of issues raised by users:

**PROBA-V/PDF**

- Sample image over DomeC: ideal acquisition time
- Issues in PROBA-V LAI and fAPAR data
- Issue in registration for validation and near real-time products
- Request for cloud-free images over Belgium and Europe
- Unable to open PROBA-V image in ArcGIS 10.2
- Forgot username account and password
- Reaction to news release: PROBA-V support by ENVI
- Can’t open PROBA-V 300 m HDF5 files
4. Image Calibration services

4.1. Radiometric Calibration

<table>
<thead>
<tr>
<th>Calibration request type</th>
<th>Total</th>
<th>Processed</th>
<th>Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLOUDS</td>
<td>24</td>
<td>17</td>
<td>0</td>
</tr>
<tr>
<td>DARK CURRENT</td>
<td>56</td>
<td>30</td>
<td>3</td>
</tr>
<tr>
<td>MOON</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>RAYLEIGH</td>
<td>78</td>
<td>59</td>
<td>1</td>
</tr>
<tr>
<td>SNOW</td>
<td>62</td>
<td>48</td>
<td>5</td>
</tr>
<tr>
<td>SUN_GLINT</td>
<td>54</td>
<td>48</td>
<td>0</td>
</tr>
</tbody>
</table>

*Table 9: Calibration Image requests for this reporting period

<table>
<thead>
<tr>
<th>Calibration image type</th>
<th>Total</th>
<th>Valid</th>
<th>Invalid (*)</th>
</tr>
</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>550</td>
<td>438</td>
<td>97</td>
</tr>
<tr>
<td>PROBA-V_L1B_INTERSECTION</td>
<td>608</td>
<td>292</td>
<td>249</td>
</tr>
<tr>
<td>PROBA-V_L1B_OVERLAPREGION</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

*Table 10: 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.

**Assessment of the radiometric image quality**

A slight increase in the Libya-4 desert calibration results for the VNIR strips of the LEFT camera is observed. This is thought to be a model/aerosol related seasonal uncertainty as a similar ‘temporal’ increase was observed during winter 2013-2014.

Overall, considering the different calibration method (Libya-4, Rayleigh, Deep Convective Clouds and Moon), the radiometric performance of the VNIR strips remains stable over the last months.

Both the dark and light response of several SWIR pixels is not stable over time resulting in some stripes visible in the SWIR images. An update of the dark current and equalization coefficients will therefore be performed to reduce the striping. The relative magnitude of these stripes seems to depend on the DN level. Dark current acquisitions with different integration times have been scheduled to further investigate the issue.
The Libya-4 results of the SWIR-3 strip of the RIGHT camera show a slight decrease. As observations are very limited (approximately 1 observation per month), quantification of the magnitude of the trend is still quite uncertain. Furthermore it has to be further investigated if the 'observed' decrease might be due to equalization issues (e.g. uncertainties in vignetting corrections) over the SWIR strip.

**Radiometric ICP file**

The current ICP files are

- PROBAV_ICP_RADIOMETRIC#LEFT_20141129_V01
- PROBAV_ICP_RADIOMETRIC#CENTER_20141129_V01
- PROBAV_ICP_RADIOMETRIC#RIGHT_20141129_V01

An update of these ICP files for dark current and SWIR equalization will be done end of this week.

### 4.2. Geometric Calibration

<table>
<thead>
<tr>
<th>Calibration image type</th>
<th>Total</th>
<th>Processed</th>
<th>Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROBA-V_L1C_INTERSECTION</td>
<td>11788</td>
<td>11788</td>
<td>0</td>
</tr>
</tbody>
</table>

*Table 11: Processed calibration images for this reporting period*
Assessment of the geometric image quality

In the reporting period, the geometric accuracy was within the requirement of < 300 m, with an average daily compliance of 99.8% for all cameras. The average ALE was < 57 m, with a standard deviation of < 49 m. The daily ALE was relatively high from 16/11 – 20/11, with values of 60 – 75 m. During the remainder of the period the ALE was within 50 – 60 m, except for 25/11 (62 m) and 12/12 (65 m). The day-to-day ALE evolution can be seen in Figure 1.”

Figure 1: Detailed evolution of ALE values per radiometric band

Geometric ICP file
The current geometric ICP files remain valid and applicable.

- PROBAV_ICP_GEOMETRIC#LEFT_20140312_V01
- PROBAV_ICP_GEOMETRIC#CENTER_20140312_V01
- PROBAV_ICP_GEOMETRIC#RIGHT_20140312_V01
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-50</td>
<td>After resync of ICP files, end time in DB is wrong</td>
<td>Open</td>
<td>15/12/2014</td>
<td>Software</td>
</tr>
<tr>
<td>PROBAVUS-49</td>
<td>Resynchronisation of purged calibration data products is not triggered</td>
<td>Resolved</td>
<td>05/12/2014</td>
<td>Software</td>
</tr>
<tr>
<td>PROBAVUS-43</td>
<td>PDF tries to restore same products multiple times</td>
<td>Resolved</td>
<td>15/07/2014</td>
<td>Software</td>
</tr>
<tr>
<td>PROBAVUS-31</td>
<td>new ICP file generation</td>
<td>Resolved</td>
<td>17/04/2014</td>
<td>Software</td>
</tr>
<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>

Table 12: List of system related issues for this reporting period

2 new issues were logged during this reporting period
0 issue(s) were resolved and closed during this reporting period
2 issues are resolved but remain to be closed formally
2 issues are resolved but remain in the list logging purposes
1 issue(s) is open and remains to be solved
5.2. Image processing issues

During the last month the following image processing issues were logged:

- Missing transfer frame files (Platform in Safe mode)
- Automatic recovery
- Pixel shifts
- Missing ancillary data
  - Missing platform data (gaps and lost frames in the VC4 data)
  - Missing spectral band data
- Missing instrument data

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># S1</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major Gaps (&gt; 21600 km² (missing TFF))</td>
<td>1</td>
</tr>
<tr>
<td>Large Gaps (&lt; 21600 km²)</td>
<td>2</td>
</tr>
<tr>
<td>Minor Gaps (&lt; 3600 km²)</td>
<td>4</td>
</tr>
<tr>
<td>Negligible Gaps (&lt; 1000 km²)</td>
<td>13</td>
</tr>
<tr>
<td>Complete synthesis (no gaps)</td>
<td>10</td>
</tr>
</tbody>
</table>

Table 13: Overview of S1 for this reporting period
6. Scheduled activities for the next period(s)

- There are no SW updates planned for the coming period.
- There are no HW updates planned for the coming period.
- Three new development are planned for the coming period:
  - An update of the cloud detection algorithm is under investigation
  - Offering GeoTIFF format next to HDF5 for all users in development (implementation of EW-PV-EOP-006)
  - Improvement of geometric accuracy using a chipset derived from Landsat GLS2010 instead of Landsat GLS2000 (implementation of EW-PV-EOP-008)

7. Operational remarks

No operational remarks for this reporting period.