Title : GOCE L1b Data Quality Control Report
April 2012

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Distribution : GOCE Users Community
## DOCUMENT CHANGE RECORD

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1. INTRODUCTION

1.1 Purpose and Scope

This document contains the Quality report for GOCE L1b data for April 2012.

The latest version of this document is available on the GOCE Data Quality portal at:

http://earth.esa.int/GOCE/ → “Level 1b QC” → “Monthly”

The GOCE Data Quality portal is the principal source for any quality-related information on GOCE products.

http://earth.esa.int/GOCE/ → “Level 1b QC”.

1.2 Glossary

The following acronyms and abbreviations have been used in this report.

<table>
<thead>
<tr>
<th>ABBREVIATION</th>
<th>MEANING</th>
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<tbody>
<tr>
<td>EGG</td>
<td>Electrostatic Gravity Gradiometer</td>
</tr>
<tr>
<td>DFACS</td>
<td>Drag Free and Attitude control system</td>
</tr>
<tr>
<td>SST-I</td>
<td>Satellite-to-satellite tracking instrument</td>
</tr>
<tr>
<td>CTR</td>
<td>Control Voltages</td>
</tr>
<tr>
<td>STR</td>
<td>Star Tracker</td>
</tr>
<tr>
<td>Trace SD</td>
<td>Trace Spectral Density</td>
</tr>
<tr>
<td>ICM</td>
<td>Inverse Calibration Matrix</td>
</tr>
<tr>
<td>GAR</td>
<td>Gradiometer Angular Rates</td>
</tr>
<tr>
<td>FPM</td>
<td>Fine Pointing Mode</td>
</tr>
<tr>
<td>MBW</td>
<td>Measurement Bandwidth</td>
</tr>
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</table>
2. APRIL 2012 OVERVIEW

08-Apr-12  Anomaly in gradients components from UTC 11:05:07 to 11:05:43 with impacts on trace.
21-Apr-12  Beam Out event at UTC 23:19:26
24-Apr-12 to 26-Apr-12 Degraded performance in the lower part of the MBW, high thrust levels, geomagnetic storm
25-Apr-12  Beam Out event at UTC 17:24:14

3. APRIL 2012 DATA QUALITY ANALYSIS

3.1 Gradients anomaly on 8th April

Trace PSD is not nominal during the reference period due to an anomalous oscillation which affects the gradients components from UTC 08/04/2012 11:05:07 to 11:05:43.

![Figure 1 Trace PSD](image)

*Figure 1 Trace PSD*
The anomaly which affects the gradients time series is displayed below:

![Gradients anomaly](image)

**Figure 2 Gradients anomaly**

The anomaly has an impact also in CM signals at high frequencies, as reported below:

![CM Signals, nominal case (left) and during the anomaly (right)](image)

**Figure 3 CM Signals, nominal case (left) and during the anomaly (right)**
3.2 Geomagnetic storm on 24th – 26th April

A high solar activity occurred at the end of the month, causing a trace not compliant in the lower part of the measurement bandwidth:

Figure 4 High trace values during geomagnetic storm

Thrust values have increased with a peak of 10.2 mN as reported below:

Figure 5 Thrust values
3.3 Beam Out events

The following Beam Out events occurred during April 2012 reference frame:

<table>
<thead>
<tr>
<th>EVENT</th>
<th>UTC TIME</th>
</tr>
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<tbody>
<tr>
<td>21-Apr-12</td>
<td>Beam Out event at UTC 23:19:26</td>
</tr>
<tr>
<td>25-Apr-12</td>
<td>Beam Out event at UTC 17:24:14</td>
</tr>
</tbody>
</table>

Table 1 Beam out events

The effects of a Beam Out event are clearly visible in the common mode acceleration, component 14_x, as a sharp peak in the acceleration values. The effect is the same as reported in previous monthly reports.

The Beam Out event enters in the gradients time series notably in the Uxx component without any relevant impacts on performance.