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Title : **GOCE L1b Data Quality Control Report
August 2012**

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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 August 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.

| ABBREVIATION | MEANING |
|--------------|--|
| EGG | Electrostatic Gravity Gradiometer |
| DFACS | Drag Free and Attitude control system |
| SST-I | Satellite-to-satellite tracking instrument |
| CTR | Control Voltages |
| STR | Star Tracker |
| Trace SD | Trace Spectral Density |
| ICM | Inverse Calibration Matrix |
| GAR | Gradiometer Angular Rates |
| FPM | Fine Pointing Mode |
| MBW | Measurement Bandwidth |

2. AUGUST 2012 OVERVIEW

| | |
|----------------------------|---|
| 01-Aug-12 | CM component 14_X presents high values due to the orbit lowering maneuver from 259.6 km down to 251 km started at UTC 06:00. |
| 02-Aug to 31-Aug-12 | Orbit lowering maneuver started the 01/08/2012 at 06:00 UTC and lasting one month (up to 31 Aug 18:20 with impact on trace when the thrust level reaches the minimum threshold (0.6 mN). This occurs each orbit for about 1000 seconds. |
| 16-Aug-12 | Anomalous oscillation found in diagonal components of the gravity gradient tensor with impacts on trace at UTC 14:13:34 |
| 21-Aug-12 | Anomalous oscillation found in diagonal components of the gravity gradient tensor with impacts on trace at UTC 19:48:12 |
| 30-Aug-12 | Anomalous oscillation found in diagonal components of the gravity gradient tensor with impacts on trace at UTC 12:20:16 |

3. AUGUST 2012 DATA QUALITY ANALYSIS

3.1 Orbit lowering maneuver

The first GOCE orbit lowering maneuver from 259.6 Km down to 251 started at UTC 01/08 06:00 and lasting one month, up to 31st August at 18:20.

During the maneuver the trace spectral density is not nominal when the satellite flights over the south pole due to minimum threshold reaching by the ion thrust propulsion (0.6 mN) causing under compensating of the drag forces. This occurs each orbit for about 1000 seconds.

Below is reported the detailed analysis of the effect:

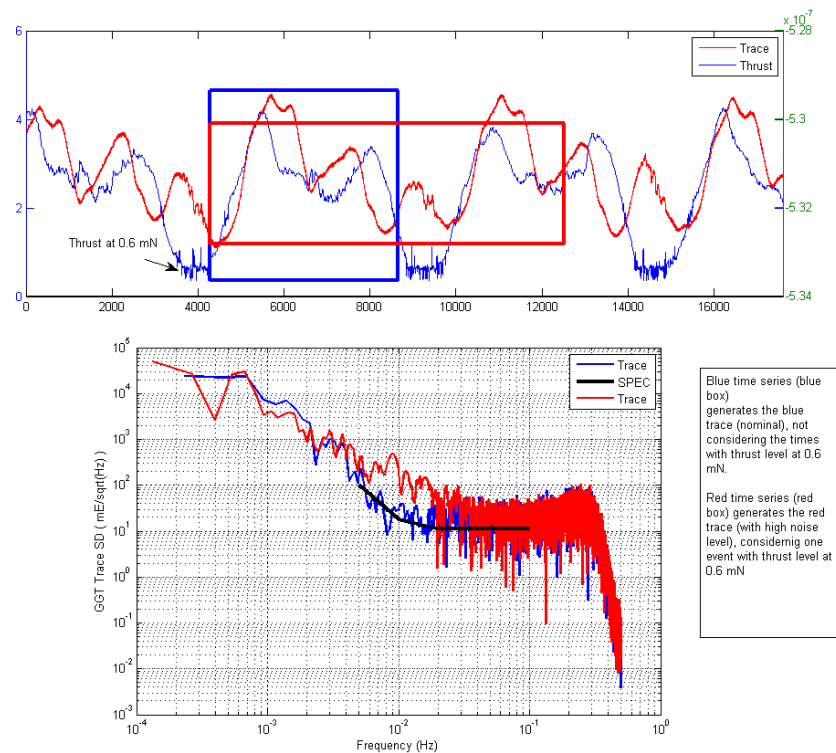


Figure 1 Effects of the orbit lowering on trace PSD

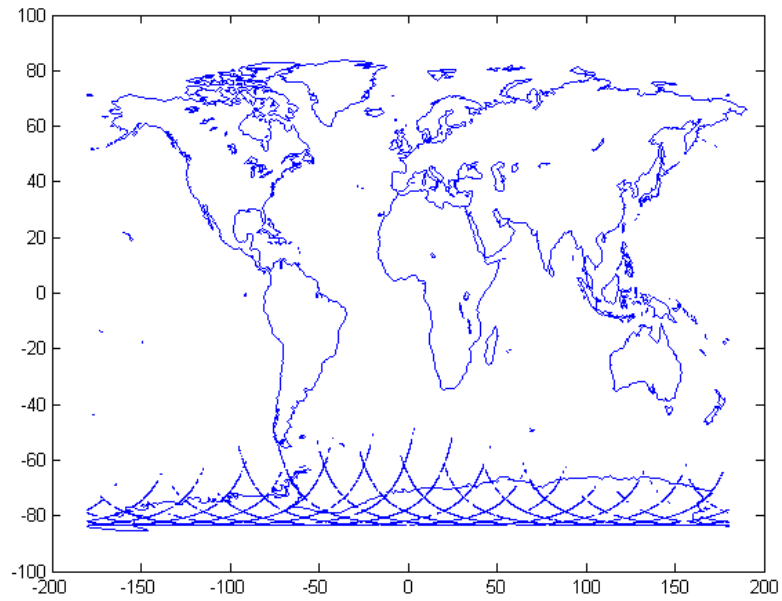


Figure 2 Geolocation of 0.6 mN thrust and not compliant trace

3.2 Anomalous oscillations in gradients time series

Three oscillations of small durations (< 5 seconds) occurred at the following UTC times, with impacts on trace:

- 16th August 14:13:34
- 21st August 19:48:12
- 30th August 12:20:16

The performance is nominal before and after the anomalies so, no long term impacts on data quality have been recognized.