

Issue Date : 19 June 2012
Issue : 2.0

Title : GOCE L1b Data Quality Control Report
April 2010

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Distribution : GOCE Users Community



DOCUMENT CHANGE RECORD

Issue	Date	Reason for Change	Changed Pages/Paragraphs
1.0	04/11/2010	First issue	
2.0	19/06/2012	Reprocessing EGG V5.0	All document



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1. INTRODUCTION

1.1 Purpose and Scope

This document contains the Quality report for GOCE L1b data for April 2010.

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

2. DATA QUALITY OVERVIEW

2.1 Instruments Quality summary tables

Apr 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

Table 1 April 2010 EGG QC Status

Apr 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

Table 2 April 2010 SST QC Status

	GAP (details within Monthly Report)
	NOT USABLE
	Special Event
	Nominal
	Calibration
	EGG in Acquisition Mode
	Not yet released

2.2 EGG data – Available baselines

Baseline	EGG Processor	SST processor
Baseline D	EGG v5 (> 5.06) installed 31/03/2012	V02.18 Patch B Installed 20/01/2011
Baseline A	EGG v4 (<4.8) Installed 18/05/2010	V02.18 Patch B Installed 20/01/2011

Baseline may be verified by reading out the <Creator_Version> tag in the file header, e.g:

<Creator_Version>05.06</Creator_Version>

(for the latest baseline)

- EGG v5 reprocessed baseline is available through the GOCE Virtual On-line Archive
→ <http://eo-virtual-archive1.esa.int/Index.html>
- EGG v4 is the older baseline. Products are still accessible through the GOCE Virtual On-line Archive

3. EGG DATA QUALITY: SPACECRAFT AND ENVIRONMENT RELATED EVENTS

3.1 Summary

For the reference period, the following events are highlighted:

- Three Beam Out events on 4th, 5th, 6th April.
- Change of DUUT configuration from STR2-1-3 to STR1-2-3 at UTC 02/04 13:00.
- Change of DUUT configuration from STR1-2-3 to STR2-1-3 at UTC 25/04 09:00.

3.2 Beam Out events

Three Beam Outs events occurred at the following UTC times:

EVENT NUMBER	UTC TIME
1	2010-04-04T13:08:28
2	2010-04-05T11:13:40
3	2010-04-06T14:27:08

Table 3 Beam out events

Below, the effects of the Beam Out in the common mode acceleration, component 14_x, are displayed, for the three events.

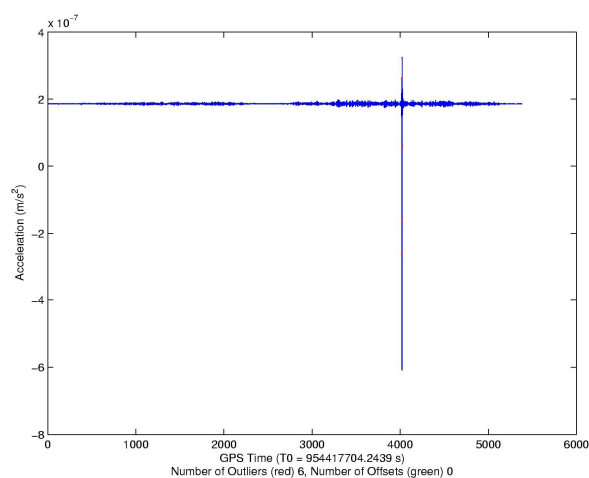


Figure 1 Beam out event on 4th April

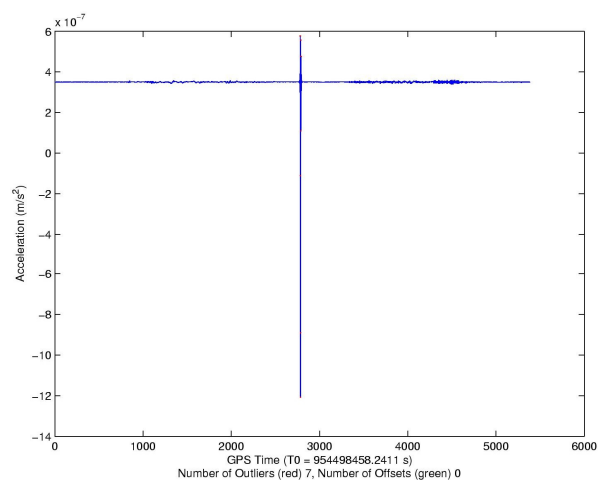


Figure 2 Beam out event on 5th April

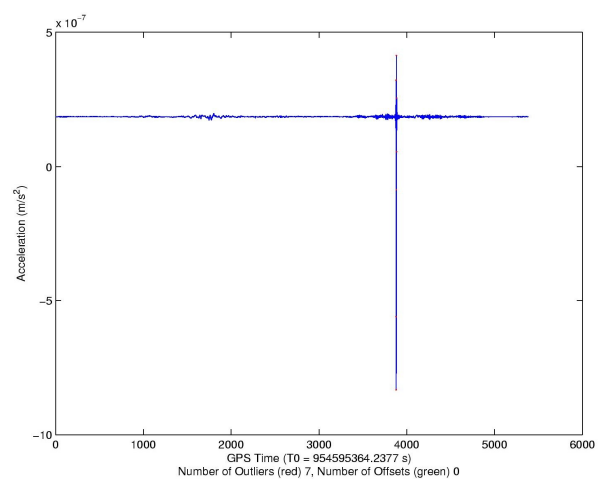


Figure 3 Beam out event on 6th April

This oscillation enters the gradients time series notably in the Uxx component.

This effect may be seen in the Gradients PSD graphs below:

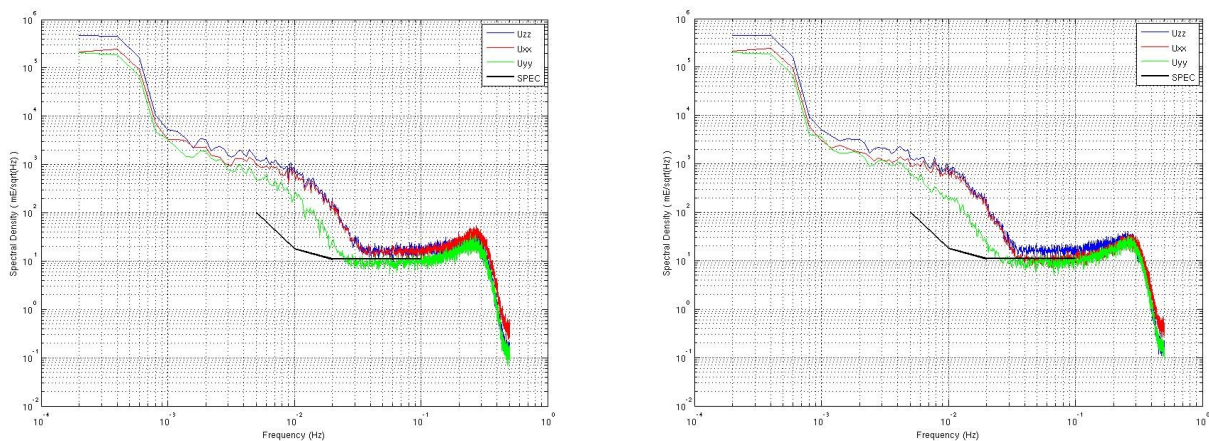


Figure 4 Gradients PSD considering the Beam Out event (left), gradients PSD not considering the Beam Out event (right)

Uxx (red in the plots) has a higher value in the PSD above, when the beam-out is included in the time interval 04/11 12:00 to 04/11 14:00 (only the trace and gradients PSD for 4th of April are reported, plots for the 5th and the 6th of April showing similar behavior.).

No relevant differences in terms of trace PSD are recognized, as reported in figure 5:

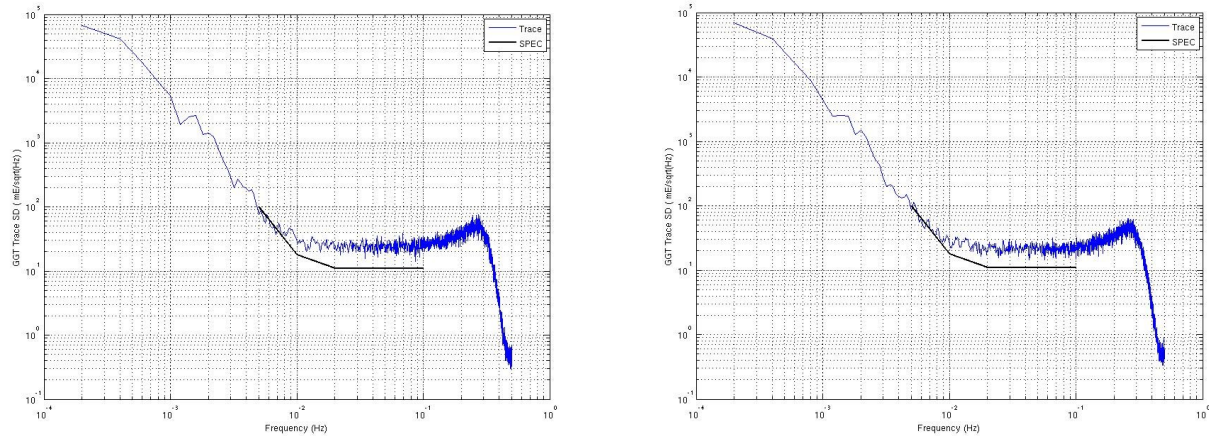


Figure 5 Trace PSD considering the Beam out event (left), trace PSD not considering the Beam out event (right)

3.3 Change of DUUT configuration

3.3.1 EGG V4

On April 2nd, the Star Tracker in the loop of the attitude control was changed from STR 2 to STR 1. On April 25th the Star Tracker in the loop was changed back from STR1 to STR2.

The use of the STR is known to cause a worsening of the performance in the lower part of the measurement bandwidth, as shown in the graph below:

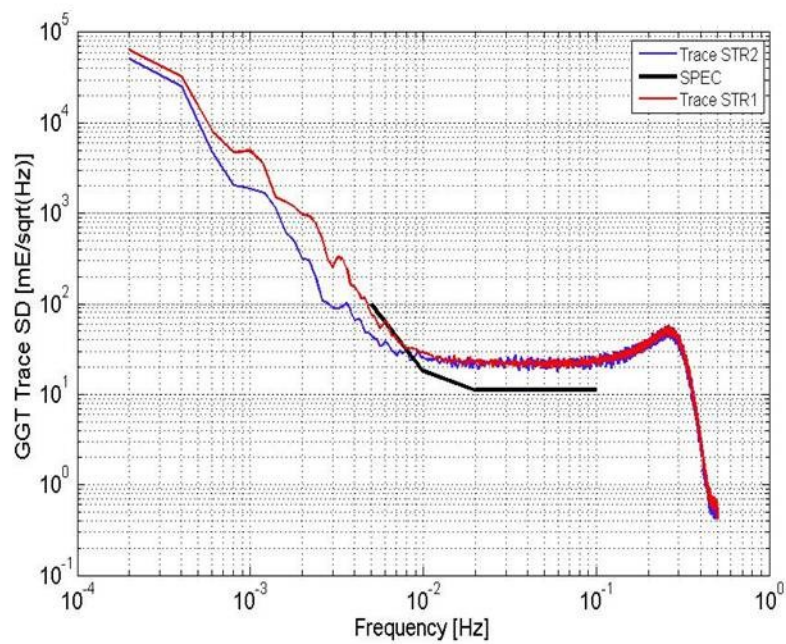


Figure 6 Trace PSD with different STR in the loop

3.3.2 EGG V5

In the new processor due to the use the virtual STR in the processing of EGG data, the effect of changing the STR in the loop is no more present.