

Issue Date : 20 June 2012
Issue : 2.0

Title : GOCE L1b Data Quality Control Report
September 2010

Author : GOCE Quality Control Team

Distribution : GOCE Users Community



DOCUMENT CHANGE RECORD

Issue	Date	Reason for Change	Changed Pages/Paragraphs
1.0	16/03/2011	First issue	
2.0	20/06/2012	Reprocessing EGG V5.0	All document



TABLE OF CONTENTS

1. INTRODUCTION	4
1.1 Purpose and Scope	4
1.2 Glossary	4
2. DATA QUALITY OVERVIEW.....	5
2.1 Instruments Quality summary tables	5
2.2 EGG data – Available baselines	5
3. EGG DATA QUALITY: SPACECRAFT AND ENVIRONMENT RELATED EVENTS	6
3.1 Summary.....	6
3.2 Recovery from the telemetry anomaly.....	6
3.3 Beam Out event	6
3.4 K2 calibration	8

1. INTRODUCTION

1.1 Purpose and Scope

This document contains the Quality report for GOCE L1b data for September 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
FPM	Fine Pointing Mode
DFM	Drag Free Mode

2. DATA QUALITY OVERVIEW

2.1 Instruments Quality summary tables

Sep 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 September 2010 EGG QC Status

Sep 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 September 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

- After the recovery from the Telemetry anomaly, which affected the nominal operations from 08th of July to the end of August, several spacecraft operations have been carried out from 2nd of September to 27th of September in order to resume the nominal science operations. The DFM_FINE was achieved on 27th of September with the EGG in Science mode on the same day at 13:25:26. EGG data before this date have not been released.
- BeamOut event on 27th of September.
- K2 calibration on 28th of September: start of the first shaking sequence for K2 calibration at 08:25, last shaking 14:35.

3.2 Recovery from the telemetry anomaly

After the recovery from the Telemetry anomaly and several spacecraft operation, the DFM_FINE status was achieved on 27th of September.

The EGG instrument reached the Science operation at UTC 13:25:26 and the first EGG_NOM_1b product released from September reference period is the following:

- GO_CONS_EGG_NOM_1b_20100927T134255_20100927T151238

SSTI data are correctly available from the product:

- GO_CONS_SST_NOM_1b_20100901T073517_20100901T090510

3.3 Beam Out event

A Beam Out event occurred at the following UTC time:

EVENT NUMBER	UTC TIME
1	2010-09-27T14:03:01

Table 3 Beam out event

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

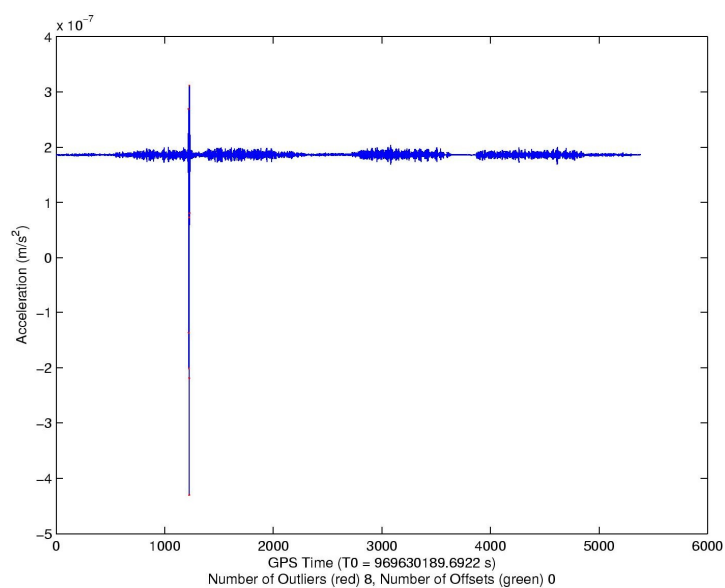


Figure 1 Beam Out event on 27th of September

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

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

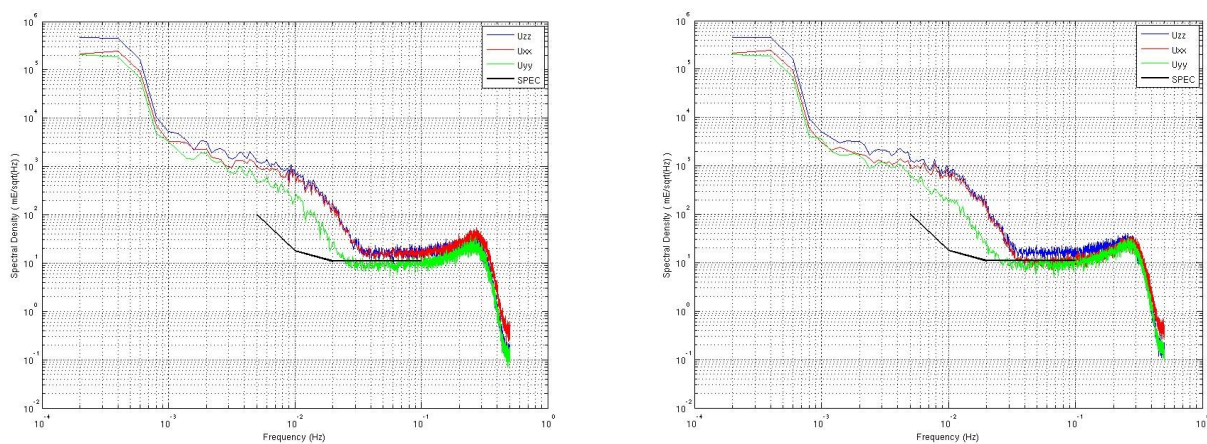


Figure 2 Gradients PSD considering the Beam Out event (left), gradients PSD not considering the Beam Out event (right)

Uxx (red in the plots) has a higher value in the PSD above, when the beam-out is included in the time interval 27/09 15:30 to 27/09 16:30.

No relevant differences in terms of trace PSD are recognized, as reported in figure 4:

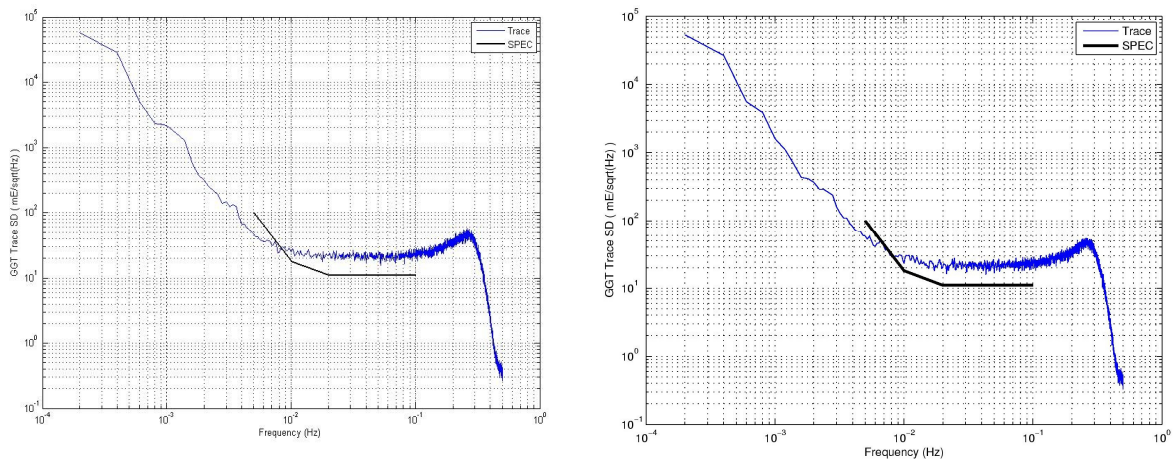


Figure 3 Trace PSD considering the Beam out event (left), trace PSD not considering the Beam out event (right)

3.4 K2 calibration

On DoY 271 (28/092011), an EGG K2 PM shaking calibration was performed on all 12 ultra-sensitive axes. This was the first K2 calibration run done since September 2009, with the purpose to determine whether any corrections of the offsets are necessary following the summer's long interruption of science operations. The timing was as follows:

- 271.08.25.00 – Enabling of DFACS 10Hz storage
- 271.08.30.00 – Start of the first shaking sequence
- 271.14:35:40 – Stop of the last shaking sequence
- 271.14.40.00 – Disabling DFACS 10Hz storage

The K2 calibration affected the following couple of products:

- GO_CONS_EGG_NOM_1b_20100928T073937_20100928T090920_0001 for the first shaking sequence.
- GO_CONS_EGG_NOM_1b_20100928T133831_20100928T150815_0001 for the second shaking sequence.

Below the effects of the K2 calibration on gradient time series (Uxx time series is reported but the same effect is visible on the other two diagonal components Uyy and Uzz):

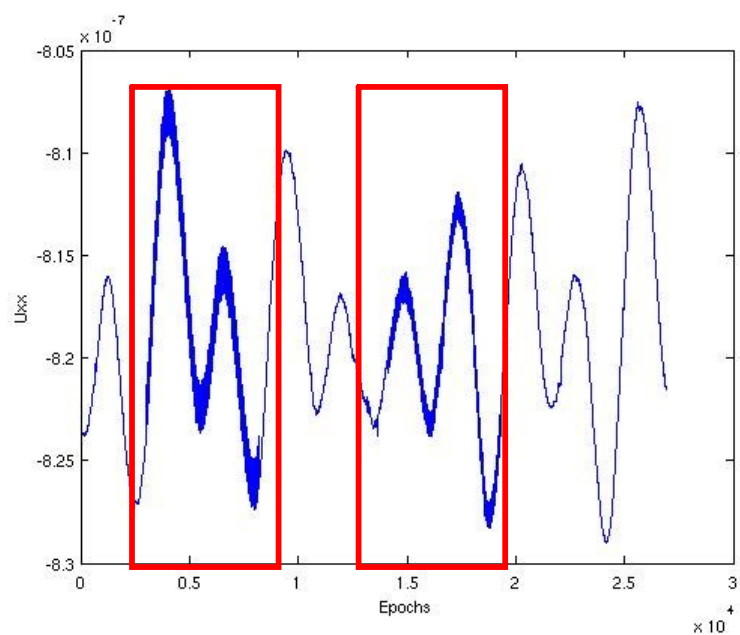


Figure 4 the first (left red box) and the second (right box) shaking sequences

Below the effects on the gradients and trace PSDs:

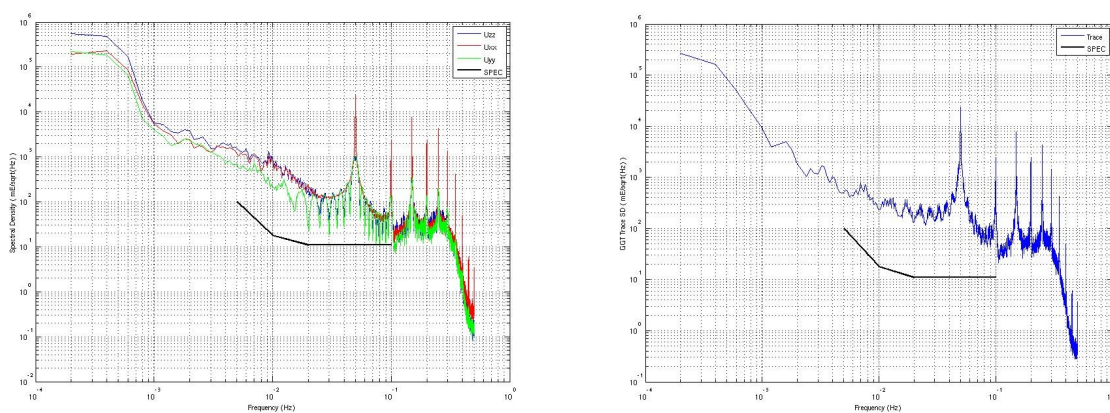


Figure 5 Gradients (left panel) and trace (right panel) PSDs during the K2 calibration