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May 2010**

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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 May 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

May 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 31

Table 1 May 2010 EGG QC Status

May 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 31

Table 2 May 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:

- Two Beam Out events on 11th and 26th May.
- EGG Instrument Calibration was performed on May 6th. EGG data are not produced during Calibration Operations.
- Anomalous oscillations in CTR, DFACS and gradients time series with impacts on trace, on 6th May at time 04:29:56.
- Jump in gradients datasets due to ICM change in the PDS processing chain on 17th May.
- Anomalous oscillation in CTR L1 and L0 Y1 and Y2 components of accelerometers 2, 3, 5, 6 and in CTR Z1 and Z2 components of accelerometers 1, 4 time series on 29th May at UTC times 10:38:39 and 12:04:04.

3.2 Beam Out events

Two Beam Outs events occurred at the following UTC times:

EVENT NUMBER	UTC TIME
1	2010-05-11T15:44:20
2	2010-05-26T04:46:05

Table 3 Beam out events

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

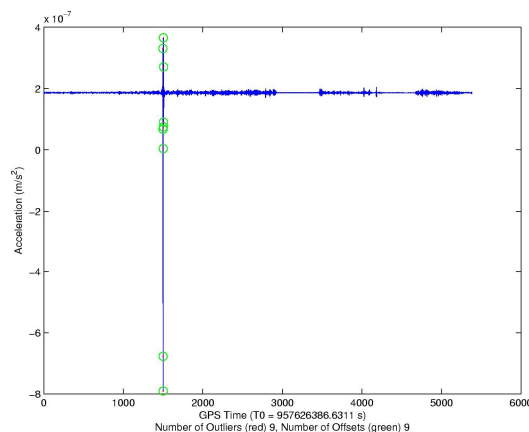


Figure 1 Beam out event on 11th May

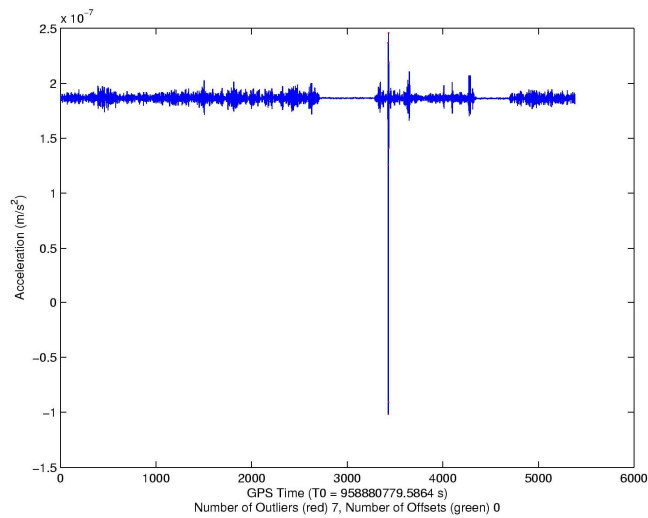


Figure 2 Beam out event on 26th May

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

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

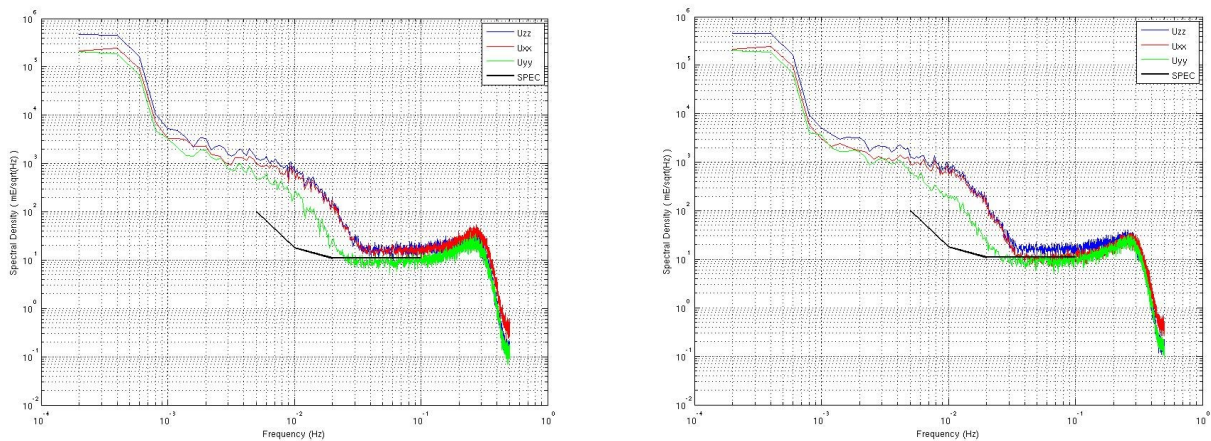


Figure 3 Gradients PSD considering the Beam Out event (left), gradients PSD not considering the Beam Out event (right)

Uxx (red in the plots) has a higher value in the PSD above, when the beam-out is included in the time interval 05/11 15:00 to 05/11 16:00 (only the trace and gradients PSD for 11th of May are reported, plots for the 26th of April showing similar behavior).

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

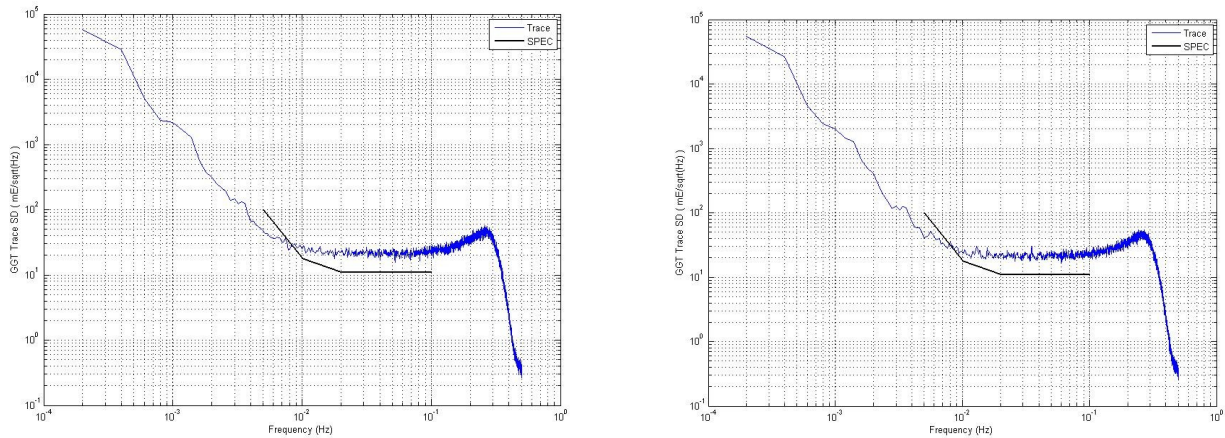


Figure 4 Trace PSD considering the Beam out event (left), trace PSD not considering the Beam out event (right)

3.3 Anomaly in L1 and L0 data

On 6th May the computed spectral density of the trace is degraded with respect to the previous time periods due to anomalous oscillation in gradients (all the components), CTR and DFACS time series at UTC 04:29:56, as reported below:

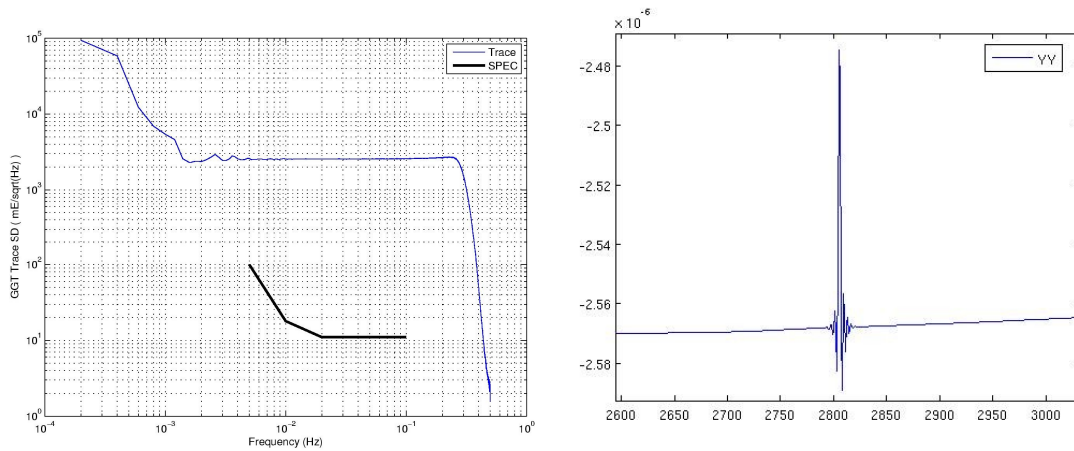


Figure 5 Trace SD (left) and YY gradients component (right)

The same oscillation is evident in all the CTR components of A2 and A5, in the X and Z components of A1 and A4, in the X and Y components of A3 and A6.

Below a plot that shows this oscillation:

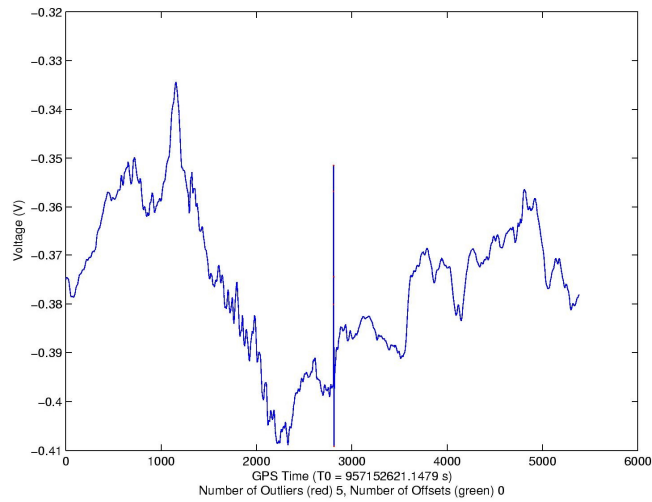


Figure 6 CTR A2_Z1

The effect is visible also in DFACS 1Hz (X, Y, Z components of all the six accelerometers) and differential mode acceleration as well, as reported below:

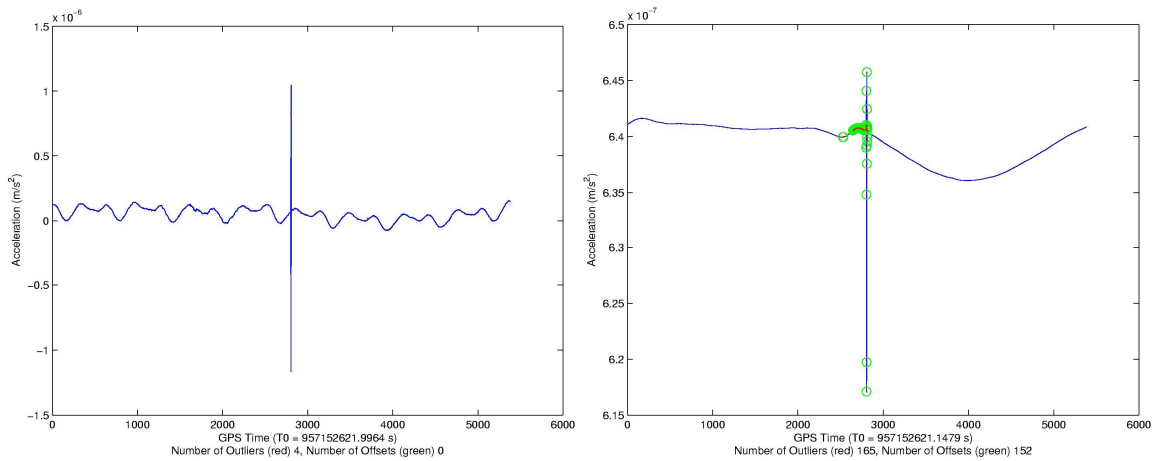


Figure 7 DFACS A1_Y time series (left) and DM acceleration for 25_Y time series (right)

The same anomaly is present in the L0 CTR datasets as well, so it's related to a spacecraft event and not to the PDGS processing.

3.4 Trace degradation on 29th May

The computed spectral density of the trace for the day 29th May presents a worse behaviour in the LMBW w.r.t. previous reference period, as reported below:

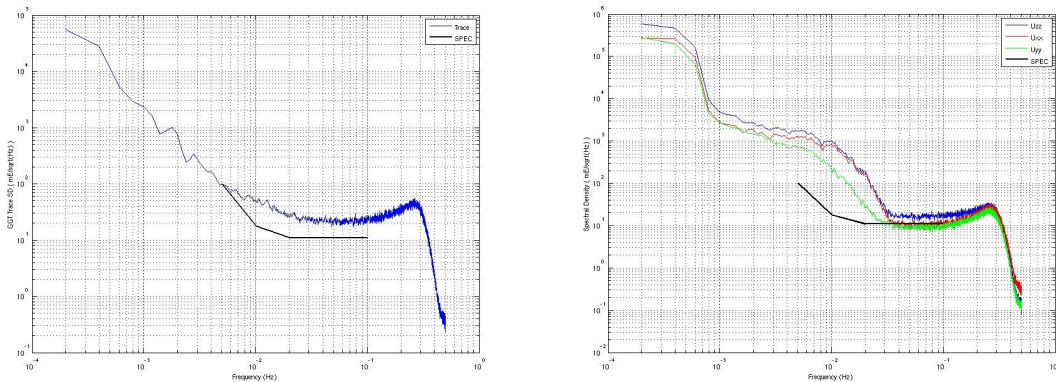


Figure 8 Trace SD 29 May

This worsening is due to two anomalous oscillations found in CTR Y1 and Y2 components of accelerometers 2, 3, 5, 6 and in CTR Z1 and Z2 components of accelerometers 1, 4.

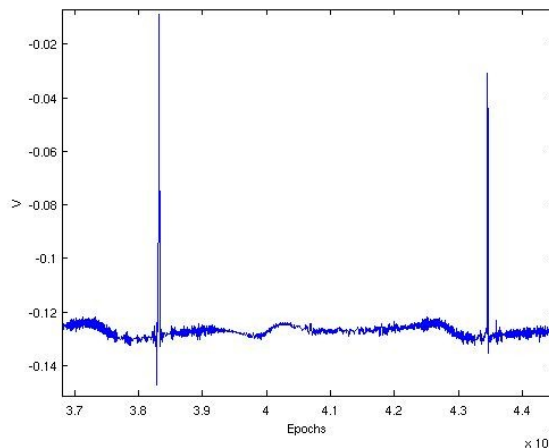


Figure 9 CTR Z1 A1 time series with the two anomalies

The first anomaly was at UTC 10:38:39, while the second at UTC 12:04:04. The two oscillations are present in **L0 data** at the same time as well but they are no more present in DM accelerations, angular rates and gradients time series.

No spacecraft special events reported in FOS Weekly for the 29 of May.

3.5 Instrument calibration on 6th May

Special Spacecraft Operations for Instrument Calibration were performed on 6th May 2010, from

- 20100506T064253

to

- 20100507T063833

EGG_NOM_1b data are unavailable during this period, i.e. between products:

- GO_CONS_EGG_NOM_1b_20100506T051310_20100506T064253

and

- GO_CONS_EGG_NOM_1b_20100507T063833_20100507T080817

Due to the new processor logic, the following products before and after the calibration, have incomplete GGT and IAQ datasets:

GO_CONS_EGG_NOM_1b_20100506T021342_20100506T034326
 GO_CONS_EGG_NOM_1b_20100506T034326_20100506T051310
 GO_CONS_EGG_NOM_1b_20100506T051310_20100506T064253
 Calibration
 GO_CONS_EGG_NOM_1b_20100507T064253_20100507T080817
 GO_CONS_EGG_NOM_1b_20100507T080817_20100507T093800
 GO_CONS_EGG_NOM_1b_20100507T093800_20100507T110744