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Title : **GOCE L1b Data Quality Control Report
February 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 of February 2010.

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

2. DATA QUALITY OVERVIEW








2.1 Instrument data quality summary tables

Feb 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

Table 1 February 2010 EGG QC Status

Feb 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

Table 2 February 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:

- A Major Satellite anomaly has occurred on February 12th, leading to switchover of the main computer and loss of EGG data.
- Spacecraft recovered Fine Pointing Mode on the 25th of February and Routine Mission operations were resumed on February 28th.
- During anomaly, EGG data are missing, while SST L0 and L1 data are mostly complete.
- Two special events have occurred, on 5/02 (Beam out) and 7/02 (Zeroed CTR measurements).. The latter causes the trace of the GG matrix to not be compliant to specifications,

3.2 Spacecraft Anomaly

The spacecraft anomaly occurred between 2010-02-12 and 2010-02-28.

3.2.1 EGG Missing data during Anomaly

All EGG data are lost during Spacecraft Anomaly.

The last EGG good product is

GO_CONS_EGG_NOM_1b_20100212T051857_20100212T064840

and the first good product after the anomaly is

GO_OPER_EGG_NOM_1b_20100302T022735_20100302T035718

3.2.2 SSTI missing data during Anomaly

During the GOCE anomaly a loss of SST L1 products occurred due to loss in telemetry, for the time frames reported below.

GAP Start	GAP Stop	GAP LENGTH [s]
2010-02-12 11 :17 :51	2010-02-13 17 :12 :26	107675
2010-02-14 14 :08 :13	2010-02-14 15 :37 :56	5383
2010-02-24 23 :50 :06	2010-02-25 16 :17 :10	59224

The loss of telemetry affects also the SST_RIN_1b data, causing gap between the following couples of products:

GO_CONS_SST_RIN_1b_20100212T094808_20100212T111751_0001
 GO_CONS_SST_RIN_1b_20100213T171226_20100213T184210_0001

GO_CONS_SST_RIN_1b_20100214T123831_20100214T140813_0001
 GO_CONS_SST_RIN_1b_20100214T153756_20100214T170738_0001

GO_CONS_SST_RIN_1b_20100224T222022_20100224T235006_0001
 GO_CONS_SST_RIN_1b_20100225T161710_20100225T174653_0001

3.3 Feb 05 special event (Beam Out)

A Beam Out event occurred at UTC time 10:30:23 visible as an oscillation in common mode acceleration and in CTR datasets as reported below:

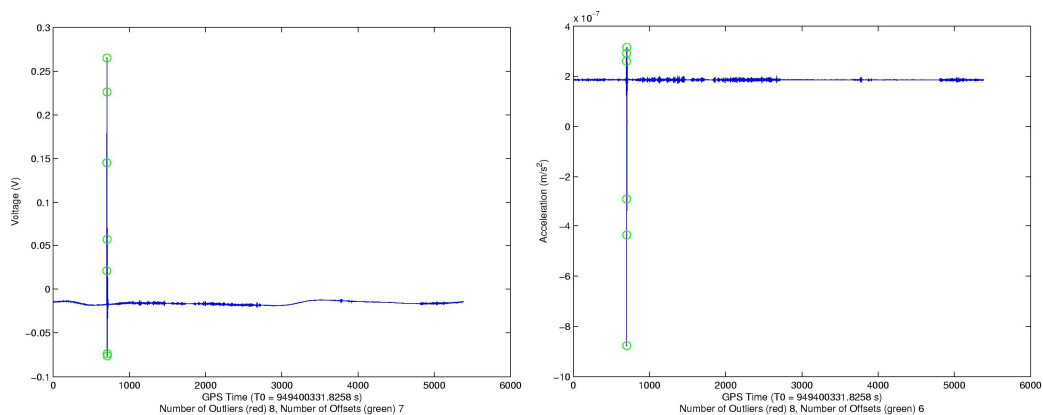


Figure 1 CTR A1 Z1 component versus GPS time (left) and Common mode Pair 14_X versus GPS time (right)

This is a spacecraft related event and nothing can be done at PDGS level to avoid the effect.

3.4 Feb 07 special event

A series of spurious zeroes in the CTR values (due to peculiar processing artifacts) has impacted the signal such as the GG tensor trace is not compliant to specs, for this day.

3.4.1 Control Voltages

Gradiometer's accelerometers control voltages (CTR) time series show sudden zeroes, see Figure 1.

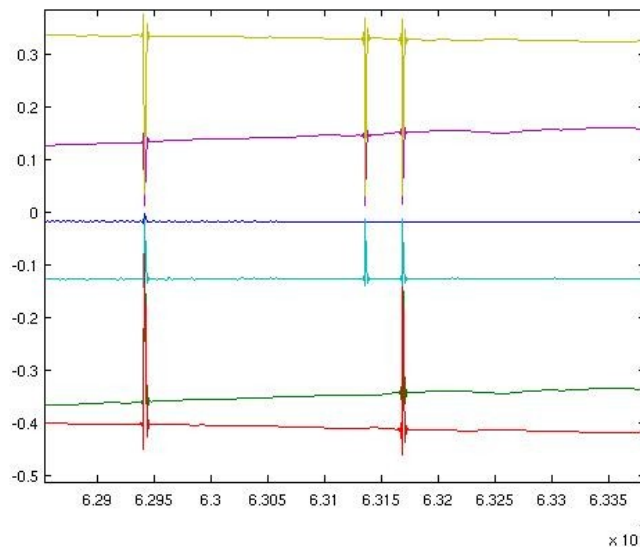


Figure 1 Y1 component of CTR for all six accelerometers, versus time (s)

3.4.2 Angular Accelerations

Angular accelerations (see Figure 4), common and differential linear accelerations are also affected by this anomaly.

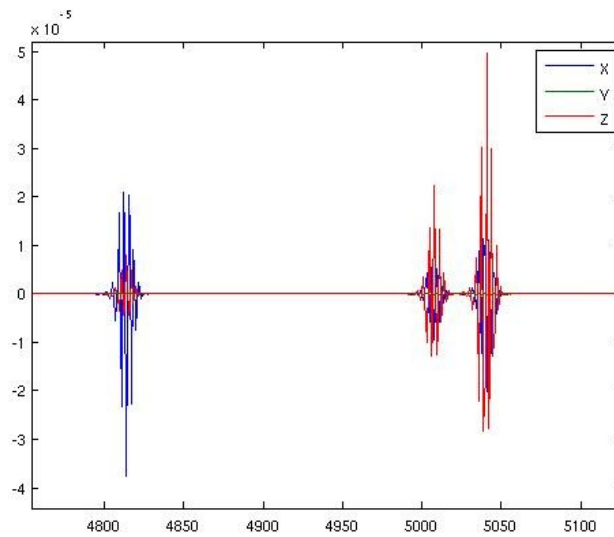


Figure 4 Angular acceleration versus time (s)

3.4.3 Gradient tensor

The time series of the xx red, yy, zz components of the gradient tensor also show, as a consequence, anomalous oscillations, with amplitudes of order $1e-5 \text{ 1/s}^2$, compared to the typical signal amplitude of order $2e-8 \text{ 1/s}^2$.

The epochs of CTR and gravity gradients events are the same.

The UTC times of the three events are reported in the table below.

EVENT #	UTC time
1	2009-02-07T17:29:02
2	2009-02-07T17:32:16
3	2009-02-07T17:32:49

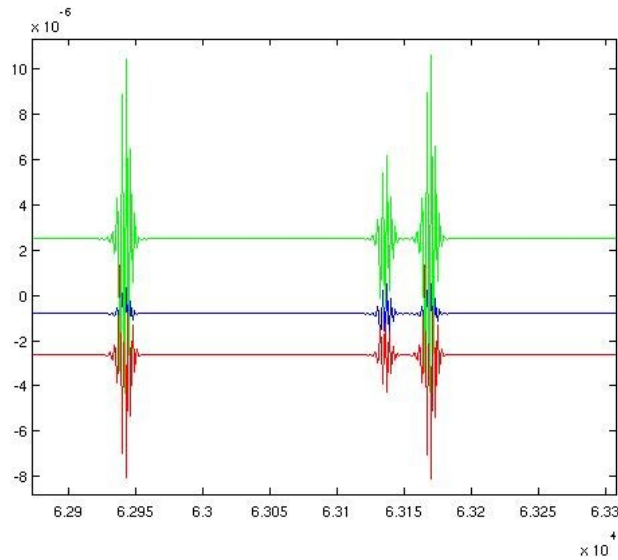


Figure 2 Time series of the components yy (red), zz (green), xx (blue) of the gradients tensor vs time (s)

3.4.4 Gravity Gradients Trace anomaly

This anomaly in gravity gradients causes the trace of the GG matrix to be not compliant to specifications, see Figure 3:

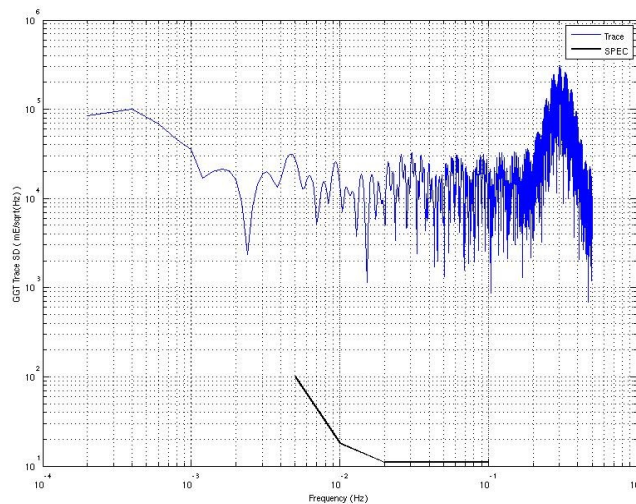


Figure 3 Spectral density of Gravity Gradients Matrix's Trace (blue). Black curve shows the specification level