

Issue Date	:	07 July 2011
Issue	:	1.0

Title : **GOCE L1b Data Quality Control Report
March 2011**

Author : **GOCE Quality Control Team**

Distribution : **GOCE Users Community**



DOCUMENT CHANGE RECORD

Issue	Date	Reason for Change	Changed Pages/Paragraphs
1.0	07/07/2011	First issue	



TABLE OF CONTENTS

1. INTRODUCTION	4
1.1 Purpose and Scope	4
1.2 Glossary	4
2. MARCH 2011 OVERVIEW.....	5
2.1 Instruments Quality summary tables	5
3. MARCH 2011 DATA QUALITY ANALYSIS	6
3.1 Anomalous oscillation in Uyy component on 4 th of March	6
3.2 Performance worsening.....	7
3.3 Beam Out events.....	8

1. INTRODUCTION

1.1 Purpose and Scope

This document contains the Quality report for GOCE L1b data for March 2011.

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

2. MARCH 2011 OVERVIEW

- Beam Out event at UTC 01/03/2011 11:01:22.
- Beam Out event at UTC 02/03/2011 08:33:22.
- Beam Out event at UTC 03/03/2011 04:34:44.
- Beam Out event at UTC 27/03/2011 20:47:58.
- Beam Out events at UTC 27/03/2011 respectively at 11:33:17 and 23:56:27.
- Oscillation found in Uyy gradients component and in CTR components of all the six accelerometers on 4th of March. No relevant impacts on performance.
- Performance worsening in the lower part of the measurement bandwidth during the 6th to 12th March time period.

2.1 Instruments Quality summary tables

Mar 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 March 2011 EGG QC Status

Mar 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 March 2011 SST QC Status

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

3. MARCH 2011 DATA QUALITY ANALYSIS

3.1 Anomalous oscillation in Uyy component on 4th of March

An anomalous oscillation was found in Uyy gradients components on 4th of March, as reported below:

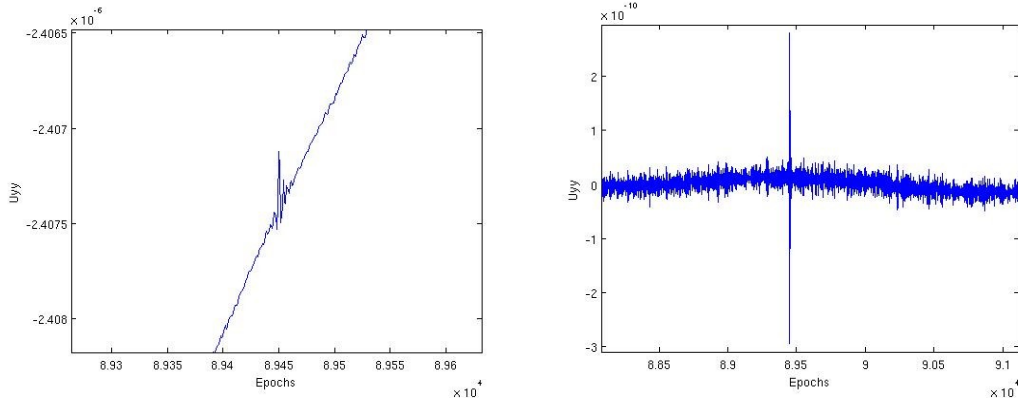


Figure 1 Uyy oscillation (left) and its first derivative (right)

The same oscillation affects also the CTR components, below an example:

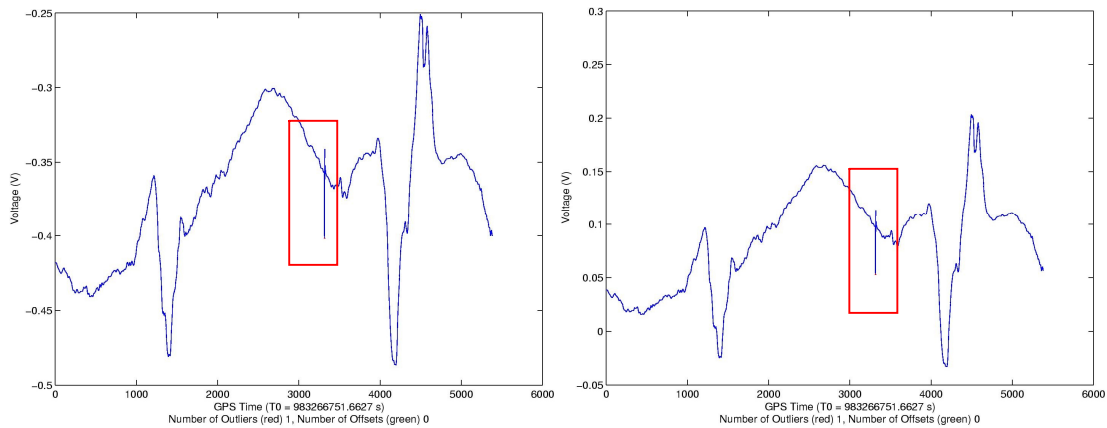


Figure 2 CTR anomaly (red boxes) on A2_Z1 (left), A5_Z1 (right)

No relevant impacts have been found on the performance as can be seen in figure 3 below:

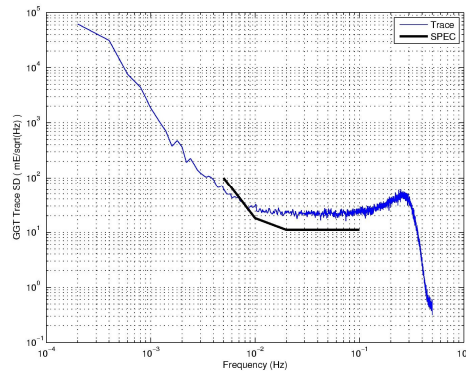


Figure 3 Trace PSD over the 4th of March time period

3.2 Performance worsening

From 06th of March a worsening of performance in the Lower part of the measurement bandwidth has been recognized, as reported below:

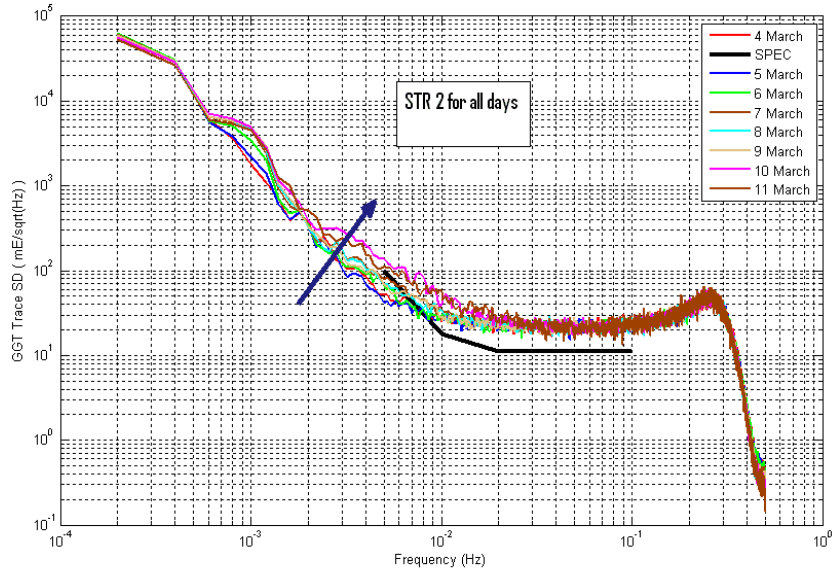


Figure 4 Trace PSD worsening

Plots of mean and standard deviation of the Trace for the days 06th to 11th of March divided per frequency bands are reported below:

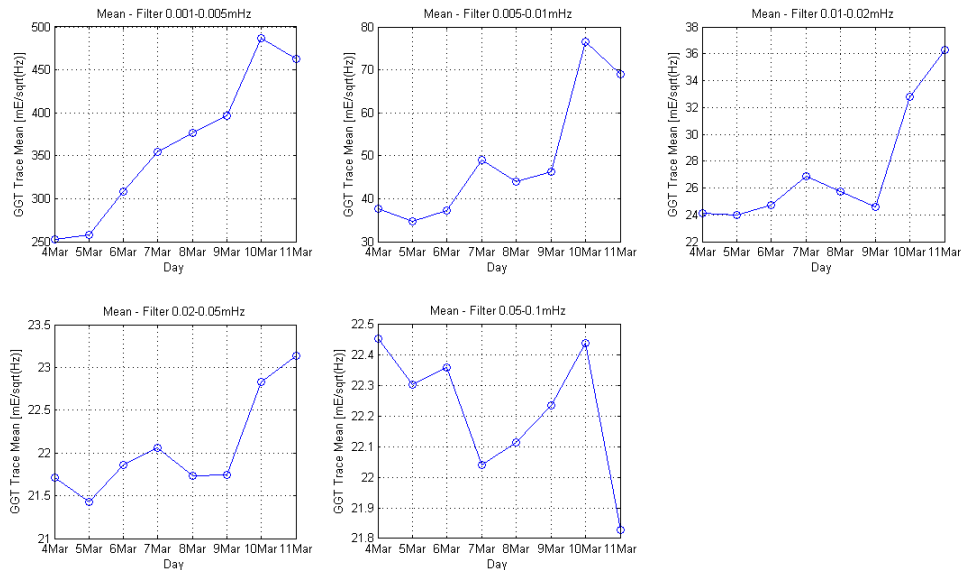


Figure 5 Trace mean

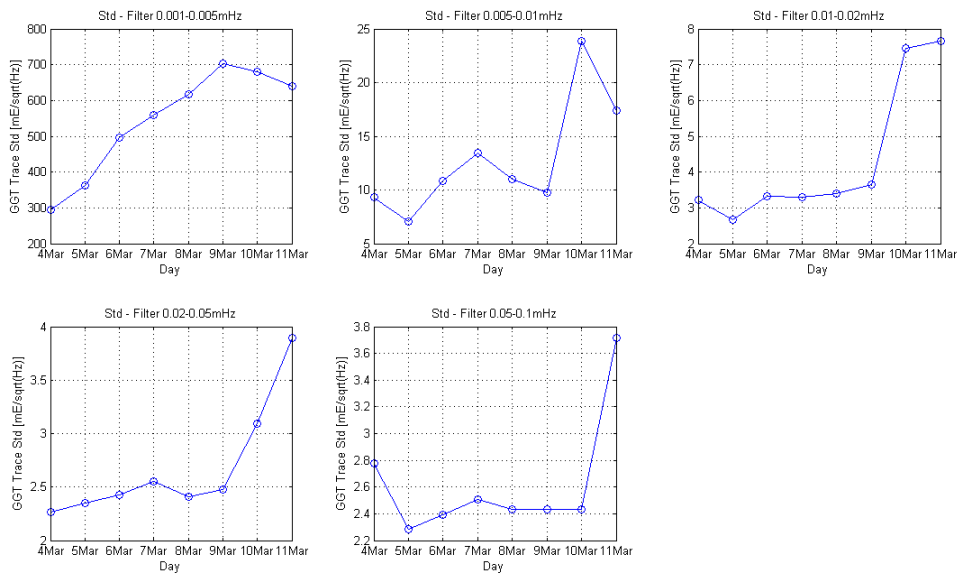


Figure 6 Trace STD

The worsening could be related to periods with more severe environmental conditions. Such periods are characterized by a higher drag (mean & peak-to-peak variations).

3.3 Beam Out events

Six Beam Out events occurred at the following UTC time during March 2011 reference frame:

EVENT NUMBER	UTC TIME
1	2011-03-01T11:01:22
2	2011-03-02T08:33:22
3	2011-03-03T04:44:34
4	2011-03-27T20:47:58
5	2011-03-31T11:33:17
6	2011-03-31T23:56:27

Table 3 Beam out event

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

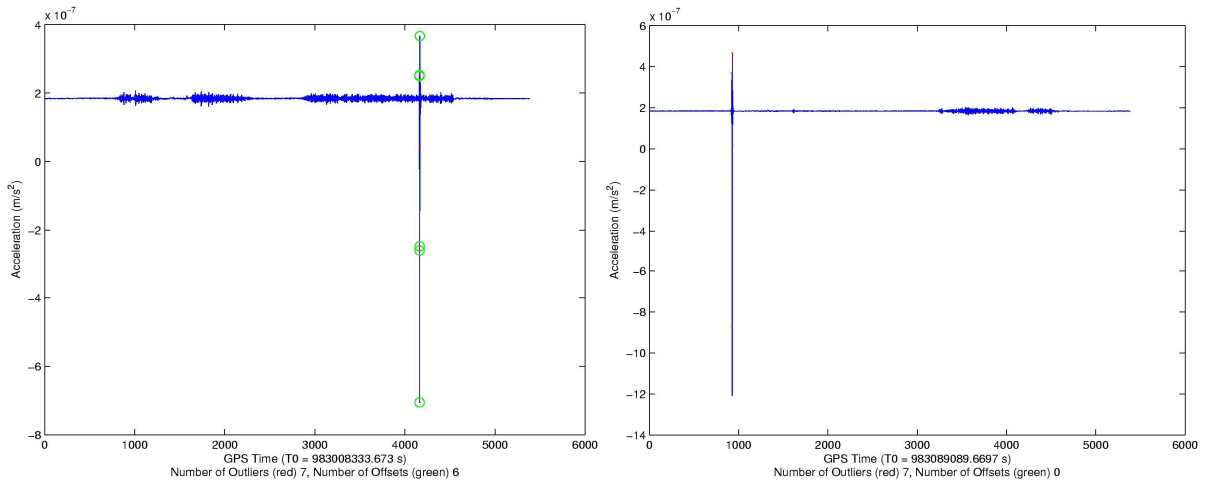


Figure 7 Beam Out event on 1st of March (left) and on 2nd of March (right)

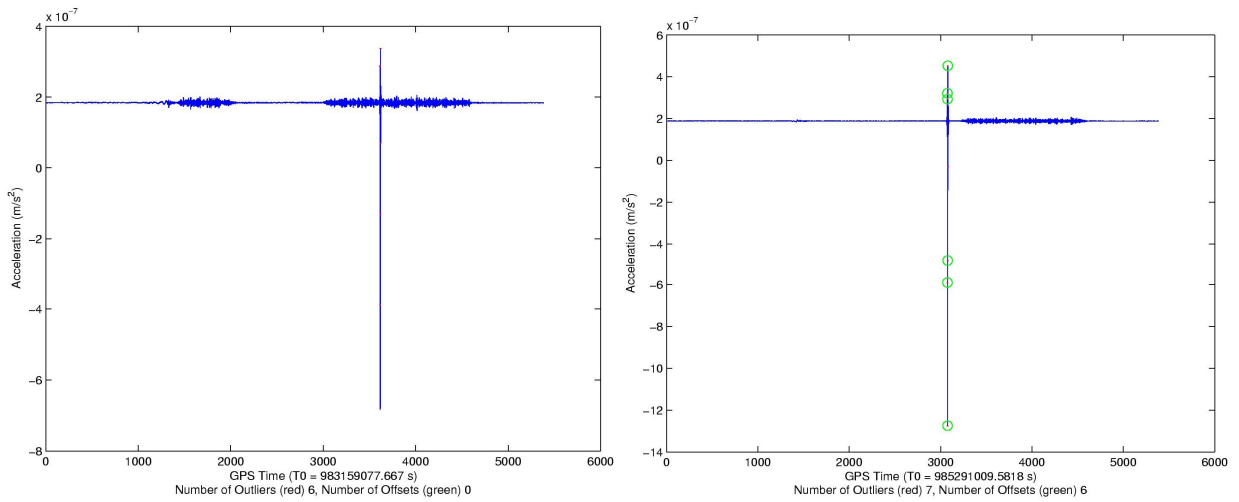


Figure 8 Beam Out event on 3rd of March (left) and on 27th of March (right)

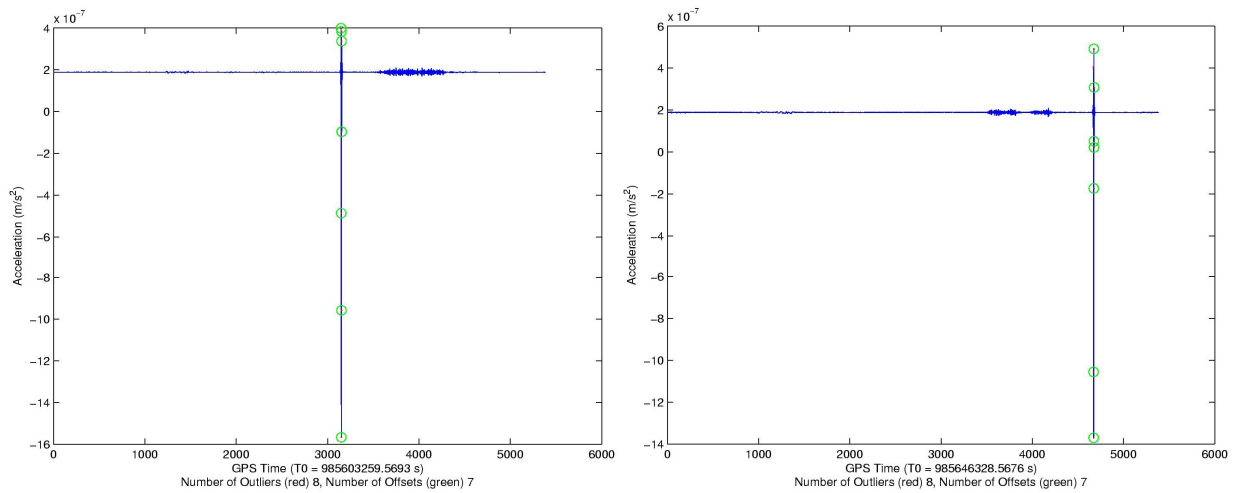


Figure 9 Beam Out events on 31st of March (first event on the left panel, second event on the right panel)

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

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

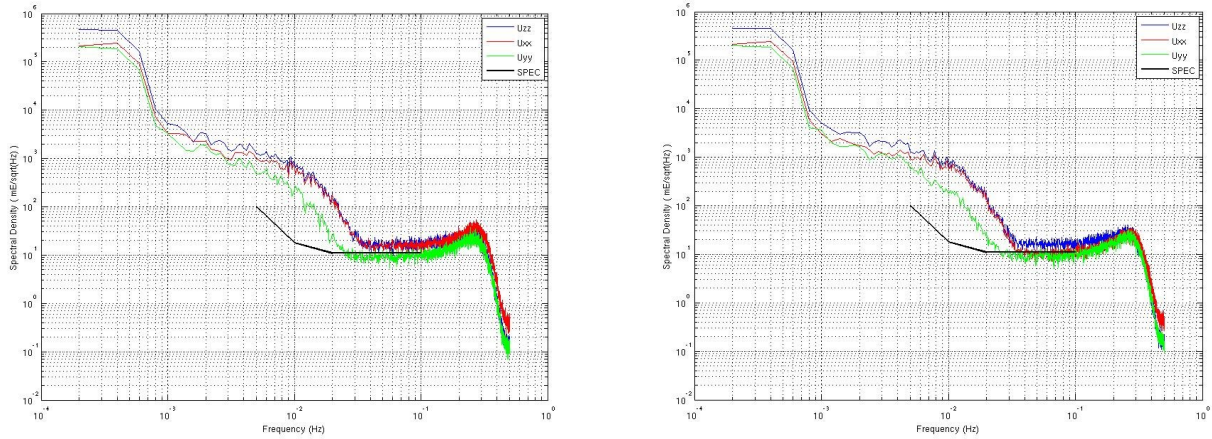


Figure 10 Gradients PSD considering the Beam Out event of 01st of March (left), gradients PSD not considering the Beam Out event of 01st of March (right)

Uxx (red in the plots) has a higher value in the PSD above, when the beam-out is included (only the trace and gradients PSD for 01st of March are reported, plots for the other Beam Out events of February show similar behavior).

No relevant differences in terms of trace PSD are recognized, as reported in figure 11:

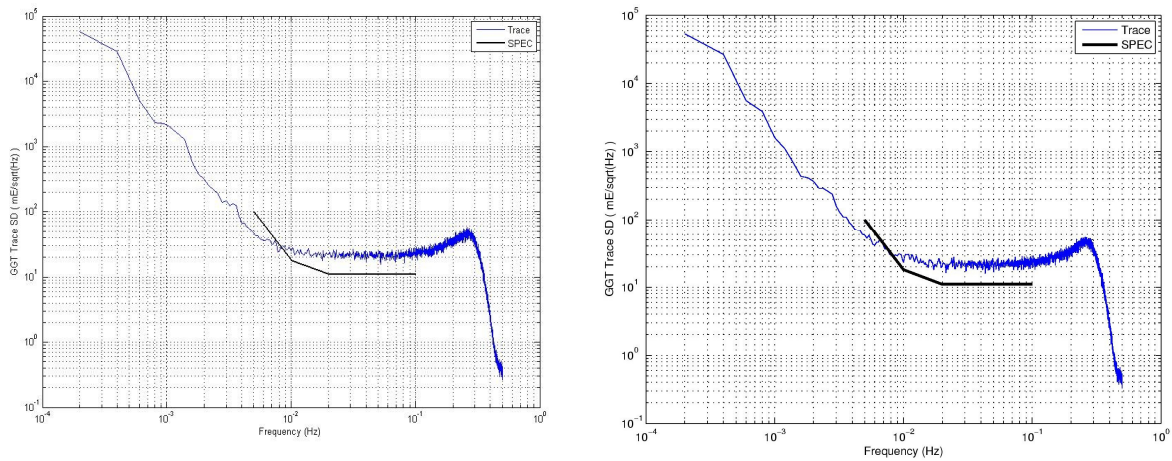


Figure 11 Trace PSD considering the Beam out event (left), trace PSD not considering the Beam out event (right)