

GRACE Science Data System Monthly Report October 2005

Prepared by:	Frank Flechtner	GFZ	flechtne@gfz-potsdam.de
Contributions by:	Srinivas Bettadpur	UTCSR	srinivas@csr.utexas.edu
	Mike Watkins	JPL	michael.m.watkins@jpl.nasa.gov
	Gerhard Kruizinga	JPL	gerhard.kruizinga@jpl.nasa.gov
Approved by:	Byron Tapley	UTCSR	tapley@csr.utexas.edu
	Christoph Reigber	GFZ	reigber@gfz-potsdam.de

Highlights:

- Reprocessed GRACE gravity fields from UTCSR, GFZ and JPL have been provided to the GRACE Science Team on November 4, 2005 (see also entries in “Level-2 Processing” and “L2 Data Distribution”).

Satellite Science Relevant Events:

- Nominal operation in Science Mode throughout the month, except on October 26/27 when the upload of the new IPU software to GRACE-1 started, which will allow radio occultation measurements, provide additional flash commands and reduce the time needed for the KBR restart. During the upload the satellite has been commanded to Attitude Hold Mode on October 26 at 06:36 and the IPU was set to track a maximum of 8 GPS satellites (before 10) in order to reduce the load on the IPU and to reduce the risk of flash problems. The upload of the new IPU software was successfully completed on October 27 and the IPU was set to track again a maximum of 10 GPS satellites. The activation of the new software took place at 09:00 by a commanded IPU reboot. Finally the auto-transition to Science Mode (SM) was enabled at 09:00.

- The GRACE-1 Brouwer mean orbital elements on November 01, 2005 00:00:00 are as follows:

A [m]	=	6843858.841
E [-]	=	0.001645
I [°]	=	89.038338

The satellites separation was 203 km on November 1 with a rate of +0.06 km/d. Thus, the next orbit maintenance maneuver has to be performed in about 6 months.

Level-0 raw data dump reception statistics at DLR ground stations Weilheim and Neustrelitz:

GRACE-1 Housekeeping:	99.7 %
GRACE-1 Science:	100.0 %
GRACE-2 Housekeeping:	99.3 %
GRACE-2 Science:	100.0 %

Level-1 Data Processing:

- Level-1B Release 01 instrument data have been processed at JPL and archived at GRACE-ISDC and JPL PO.DAAC.
- Note: On October 1 several changes have been implemented in the L1 operational software:
 - 1) Use of GPS antenna phase maps (both GRACE and GPS transmitters)
 - 2) Tighter postfit edit criteria
 - 3) GGM02C instead of GGM01C
 - 4) Shailen Desai's implementation of ocean tides (using FES2004)
 - 5) Slightly smaller process noise on empirical accelerations

The plot below shows the KBR-GPS statistics for 2003 and 2004 with the released version (V00) and the changes listed above. It is clearly visible that the fits dramatically improved. Nevertheless, it is not expected that these changes have any influence on gravity field production.

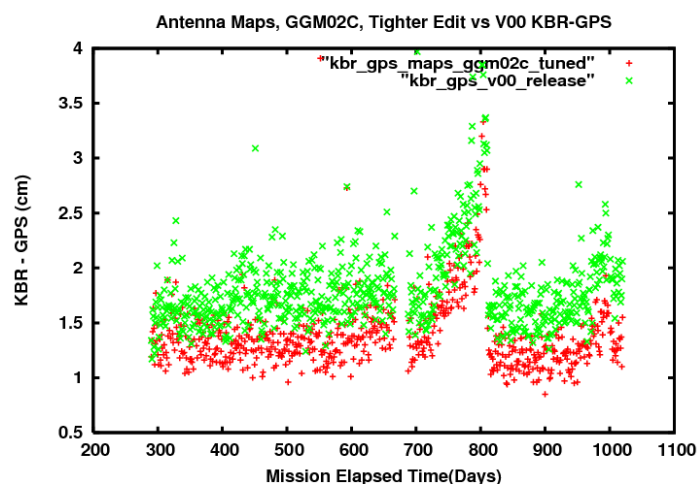


Figure 1: KBR-GPS statistics for 2003 and 2004 for 'standard' RL00 (green) and including processing changes listed above (red).

The columns in the table are:

- A) KBR1B product name
- B) Total arc length with data (hours)
- C) Number of observations used in residual calculation
- D) KBR-GPS range residual RMS (cm)
- E) minimum KBR-GPS range residual (cm)
- F) maximum KBR-GPS range residual (cm)
- G) number of continuous segments in the KBR product

A	B	C	D	E	F	G
KBR1B_2005-09-30_X_01.dat	23.8	17117	1.92	-8.9	6.0	4
KBR1B_2005-10-01_X_01.dat	23.9	17246	1.45	-5.3	6.5	2
KBR1B_2005-10-02_X_01.dat	23.7	17057	1.27	-3.3	4.1	4
KBR1B_2005-10-03_X_01.dat	24.0	17252	1.33	-3.1	5.5	3
KBR1B_2005-10-04_X_01.dat	23.7	17100	2.01	-5.3	7.0	2
KBR1B_2005-10-05_X_01.dat	23.8	17145	1.74	-5.3	4.9	2
KBR1B_2005-10-06_X_01.dat	24.0	17280	1.31	-3.7	4.6	1
KBR1B_2005-10-07_X_01.dat	23.8	17130	1.74	-4.1	5.6	3
KBR1B_2005-10-08_X_01.dat	23.8	17170	1.61	-4.2	5.1	2
KBR1B_2005-10-09_X_01.dat	24.0	17280	1.23	-3.1	3.5	1
KBR1B_2005-10-10_X_01.dat	24.0	17280	1.26	-2.7	2.9	1
KBR1B_2005-10-11_X_01.dat	23.9	17185	1.31	-4.6	4.0	2
KBR1B_2005-10-12_X_01.dat	24.0	17260	1.33	-4.0	4.4	1
KBR1B_2005-10-13_X_01.dat	23.8	17102	1.54	-4.3	4.5	3
KBR1B_2005-10-14_X_01.dat	23.9	17177	1.39	-4.6	4.9	2
KBR1B_2005-10-15_X_01.dat	24.0	17260	1.32	-3.2	3.7	1
KBR1B_2005-10-16_X_01.dat	23.9	17205	1.33	-3.4	3.8	2
KBR1B_2005-10-17_X_01.dat	24.0	17280	1.26	-3.3	2.8	1
KBR1B_2005-10-18_X_01.dat	24.0	17280	1.23	-3.6	2.9	1
KBR1B_2005-10-19_X_01.dat	23.8	17145	1.52	-5.8	5.2	2
KBR1B_2005-10-20_X_01.dat	24.0	17280	1.04	-3.2	2.5	1
KBR1B_2005-10-21_X_01.dat	not yet distributed					
...						
KBR1B_2005-10-31_X_01.dat	not yet distributed					

- Release 01 Level-1B barotropic sea level products (OCN1B) and de-aliasing products (AOD1B) until October 31, 2005 were calculated by GFZ and archived at GRACE-ISDC.
- Release 03 Level 1B de-aliasing products (AOD1B) based on OMCT (Ocean Model for Circulation and Tides) baroclinic ocean model, OMCT atmospheric S2 tide filtering and 2001+2002 mean field has been calculated by GFZ for period April 2002 until September 2005 and archived at GRACE-ISDC.

Level-2 Data Processing:

- All 3 L2 centers at CSR, JPL and GFZ have concentrated to reprocess gravity field products based on improved processing strategy, standards and background models. The results have been presented at the GRACE Science Team Meeting in Austin, October 13./14., 2005.

GRACE Product Distribution:

- Constrained field from UTCSR, and the associated Level-1B products, for August 2005 are now available to the GRACE Science Team at PO.DAAC/ISDC.
- As stated above, the improved time series (GSM along with corresponding GAC products) have been provided to the GRACE Science Team on November 4 to be used in their AGU presentations. Note that the filename convention has been changed! Updated L2 User Handbook, L2 Processing Standard Documents and L2 Release notes will be made available too.
- The products are available at ISDC using the usual batch or retrieval function. Please use the Science Team area.
- At PO.DAAC the Science Team can download the products from the password protected ftp site at podaac.jpl.nasa.gov:
 - CSR products are in data/L2/csr/RL02
 - GFZ products are in data/L2/gfz/RL03
 - JPL products are in data/validation/jpl/RL02
- The release 03 GSM products provided by GFZ are as follows (status 4.11.2005):
 - GSM-2_2003032-2004336_0430_EIGEN_G---_0003 (mean field)
 - GSM-2_2003032-2003060_0020_EIGEN_G---_0003
 - GSM-2_2003060-2003091_0027_EIGEN_G---_0003
 - GSM-2_2003091-2003120_0029_EIGEN_G---_0003
 - GSM-2_2003121-2003142_0020_EIGEN_G---_0003
 - GSM-2_2003182-2003213_0030_EIGEN_G---_0003

GSM-2_2003213-2003244_0026_EIGEN_G---_0003
GSM-2_2003244-2003274_0028_EIGEN_G---_0003
GSM-2_2003274-2003303_0029_EIGEN_G---_0003
GSM-2_2003305-2003334_0027_EIGEN_G---_0003
GSM-2_2003335-2004001_0029_EIGEN_G---_0003
GSM-2_2004035-2004061_0025_EIGEN_G---_0003
GSM-2_2004061-2004092_0030_EIGEN_G---_0003
GSM-2_2004092-2004122_0027_EIGEN_G---_0003
GSM-2_2004122-2004153_0027_EIGEN_G---_0003
GSM-2_2004153-2004183_0030_EIGEN_G---_0003
GSM-2_2004306-2004336_0026_EIGEN_G---_0003

- The release 02 GSM products provided by UTCSR are as follows (status 4.11.2005):

GSM-2_2003182-2003212_0031_UTCSR_0000_0002
GSM-2_2003213-2003243_0030_UTCSR_0000_0002
GSM-2_2003244-2003273_0029_UTCSR_0000_0002
GSM-2_2003274-2003304_0031_UTCSR_0000_0002
GSM-2_2003305-2003333_0027_UTCSR_0000_0002
GSM-2_2003335-2003365_0031_UTCSR_0000_0002
GSM-2_2004001-2004013_0013_UTCSR_0000_0002
GSM-2_2004035-2004060_0026_UTCSR_0000_0002
GSM-2_2004061-2004091_0031_UTCSR_0000_0002
GSM-2_2004092-2004121_0030_UTCSR_0000_0002
GSM-2_2004122-2004152_0028_UTCSR_0000_0002
GSM-2_2004153-2004182_0030_UTCSR_0000_0002
GSM-2_2004306-2004335_0030_UTCSR_0000_0002
GSM-2_2004336-2004366_0028_UTCSR_0000_0002
GSM-2_2005001-2005031_0031_UTCSR_0000_0002
GSM-2_2005032-2005059_0028_UTCSR_0000_0002
GSM-2_2005060-2005090_0028_UTCSR_0000_0002

- The release 02 GSM products provided by JPL are as follows (status 4.11.2005):

GSM-2_2003001-2003031_0027_JPLEM_0000_0002
GSM-2_2003032-2003059_0022_JPLEM_0000_0002
GSM-2_2003060-2003090_0027_JPLEM_0000_0002
GSM-2_2003091-2003120_0028_JPLEM_0000_0002
GSM-2_2003121-2003141_0021_JPLEM_0000_0002
GSM-2_2003182-2003212_0030_JPLEM_0000_0002

GSM-2_2003213-2003243_0027_JPLEM_0000_0002
GSM-2_2003244-2003273_0029_JPLEM_0000_0002
GSM-2_2003274-2003304_0029_JPLEM_0000_0002
GSM-2_2003305-2003334_0027_JPLEM_0000_0002
GSM-2_2003335-2003365_0030_JPLEM_0000_0002
GSM-2_2004001-2004013_0013_JPLEM_0000_0002
GSM-2_2004035-2004060_0026_JPLEM_0000_0002
GSM-2_2004061-2004091_0030_JPLEM_0000_0002
GSM-2_2004092-2004121_0027_JPLEM_0000_0002
GSM-2_2004122-2004152_0030_JPLEM_0000_0002
GSM-2_2004153-2004182_0030_JPLEM_0000_0002
GSM-2_2004306-2004335_0030_JPLEM_0000_0002
GSM-2_2004336-2004366_0028_JPLEM_0000_0002
GSM-2_2005001-2005031_0031_JPLEM_0000_0002
GSM-2_2005032-2005059_0027_JPLEM_0000_0002
GSM-2_2005060-2005090_0027_JPLEM_0000_0002
GSM-2_2005091-2005120_0030_JPLEM_0000_0002

- It is very likely that several additional months will be provided by all processing centers within the next days. Science Team will be informed by mail.

Miscellaneous:

- On October 16 the GRACE satellites completed their 20.000th revolution around the Earth.
- GRACE Science Team Meeting (GSTM) was held in Austin on October 13/14, 2005 (see <http://www.csr.utexas.edu/grace/GSTM>).
- Selected and reviewed presentations from the July 2004 Joint CHAMP/GRACE Science Meeting will be published in a special issue of EGU's 'Advances of Geosciences'.
- Science data users are encouraged to submit citations of their own and other works related with GRACE to the bibliography web page implemented at PO.DAAC: <http://podaac.jpl.nasa.gov/grace/bibliography.html>.