GRACE Science Data System Monthly Report
May 2007

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Highlights:

- Professor Markus Rothacher, head of GFZ Department 1 "Geodesy and Remote Sensing" has agreed to replace Professor Christoph Reigber as the Co-PI for the GRACE Mission. This transition is effective immediately. His contact information is:

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- RL04 Level-2 products have been provided for March and April 2007 by GFZ and for March 2007 by CSR. For further details see GRACE Product Distribution Section below.
- On May 15 GFZ has updated the RL04 Level-2 GSM products for August, October and November 2002 as well as for January and February 2007 because previously these products did not contain drift rates (GRDOTA records) for C21 and S21 coefficients. Users are strongly recommended to download these products once again. Note that ISDC-users have to delete the old L2 products in their FTP-directory before requesting them again!
- GFZ has provided the January 2007 RL03 Level-2 products. After exactly four years the generation of RL03 will be stopped and substituted by RL04.

Satellite Science Relevant Events:

- Nominal operation in Science Mode throughout the month except the events mentioned in the Level-1 Data Processing Section below.

- The GRACE-1 Brouwer mean orbital elements on June 1, 2007 00:00:00 are as follows:

  A [m] = 6840676.263

  E [-] = 0.001814

  I [°] = 89.011026

  The satellites separation was 226 km on June 1, 2007 with a rate of -0.10 km/d. Next orbit maintenance maneuver won't be needed for some months.

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

GRACE-1 Housekeeping:	99.7 %
GRACE-1 Science:	99.9 %
GRACE-2 Housekeeping:	99.7 %
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.
- **Notes:**
  - On 2007-05-03 the GRACE-B redundant GPS receiver experienced an anomaly at 7:50. All GRACE-B science data was lost from 7:50 till 15:48 when the main GPS receiver was activated. The formal clock error cutoff was raised from 10 cm to 20 cm for CLK1B on GRACE B. Total KBR1B data loss 8 hours and 4 minutes.
  - On 2007-05-04 GRACE-B KBR could not lock onto signal due to poor KBR frequency predicts after an IPU reboot occurred on 02:24. Both K and Ka signals were reacquired at 6:26. Total KBR1B data loss 4 hours and 7 minutes.
  - On 2007-05-16 the IPU (Instrument Processing Unit) software upgrade was started on GRACE-B. For this upload the maximum number of GPS satellites tracked was set to 6 from 01:37 till 10:50 and set to 8 from 10:50 till 15:22. The reduced number of GPS satellites tracked resulted in a slightly degraded orbit which can be seen in the KBR-GPS RMS of 2.30 cm.
  - On 2007-05-23 the IPU software upgrade was completed on GRACE-B. After a commanded IPU reboot on GRACE-B at 12:09 another spontaneous occurred at 12:39. From 12:09 till 12:39 there was not enough GPS data available to compute CLK1B products. Therefore KBR1B data is lost during this time interval.

- KBR statistics:
  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_2007-04-27_X_01.dat	24.0	17280	1.60	-4.7	4.6	1
KBR1B_2007-04-28_X_01.dat	24.0	17280	1.75	-4.7	7.9	1
KBR1B_2007-04-29_X_01.dat	24.0	17280	1.60	-3.3	6.0	1
KBR1B_2007-04-30_X_01.dat	24.0	17280	1.63	-5.5	5.5	1
KBR1B_2007-05-01_X_01.dat	24.0	17280	1.69	-5.1	4.0	1
KBR1B_2007-05-02_X_01.dat	24.0	17280	1.55	-4.2	3.9	1
KBR1B_2007-05-03_X_01.dat	15.9	11471	1.72	-6.3	4.5	2
KBR1B_2007-05-04_X_01.dat	19.7	14159	1.77	-4.2	5.0	4
KBR1B_2007-05-05_X_01.dat	23.9	17220	1.80	-5.6	4.6	4
KBR1B_2007-05-06_X_01.dat	24.0	17280	2.11	-5.4	5.7	1
KBR1B_2007-05-07_X_01.dat	24.0	17280	1.83	-4.4	5.5	1
KBR1B_2007-05-08_X_01.dat	24.0	17280	1.97	-4.7	6.3	1
KBR1B_2007-05-09_X_01.dat	23.8	17145	1.73	-5.6	5.1	2
KBR1B_2007-05-10_X_01.dat	23.8	17145	1.76	-4.9	4.1	2
KBR1B_2007-05-11_X_01.dat	24.0	17280	1.79	-6.0	5.9	1
KBR1B_2007-05-12_X_01.dat	24.0	17280	1.76	-3.9	7.2	1
KBR1B_2007-05-13_X_01.dat	24.0	17280	1.78	-6.0	4.9	1
KBR1B_2007-05-14_X_01.dat	24.0	17280	1.80	-5.0	6.5	1
KBR1B_2007-05-15_X_01.dat	23.8	17120	1.84	-6.5	6.1	2
KBR1B_2007-05-16_X_01.dat	23.6	17010	2.30	-5.7	6.2	3
KBR1B_2007-05-17_X_01.dat	23.9	17185	2.03	-5.3	7.1	2
KBR1B_2007-05-18_X_01.dat	23.8	17145	1.84	-5.4	6.2	2
KBR1B_2007-05-19_X_01.dat	24.0	17280	1.99	-4.7	4.5	1
KBR1B_2007-05-20_X_01.dat	24.0	17280	1.47	-3.5	3.9	1
KBR1B_2007-05-21_X_01.dat	24.0	17280	1.82	-4.5	6.0	1

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KBR1B_2007-05-22_X_01.dat  24.0  17280  1.90    -5.3    5.8  1
KBR1B_2007-05-23_X_01.dat  23.4  16845  1.74    -4.8    9.4  2
KBR1B_2007-05-24_X_01.dat  24.0  17280  1.68    -4.2    4.4  1
KBR1B_2007-05-25_X_01.dat  24.0  17280  1.82    -7.7    4.2  1
KBR1B_2007-05-26_X_01.dat  24.0  17258  2.01    -5.1    6.3  1
KBR1B_2007-05-27_X_01.dat  24.0  17280  1.65    -6.3    4.6  1
KBR1B_2007-05-28_X_01.dat  24.0  17280  1.50    -4.7    4.2  1
KBR1B_2007-05-29_X_01.dat  23.7  17085  1.57    -5.0    3.8  2
KBR1B_2007-05-30_X_01.dat  24.0  17280  1.86    -4.9    4.5  1
KBR1B_2007-05-31_X_01.dat  24.0  17280  1.42    -3.5    4.6  1
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- L1B De-aliasing Products Status
    - Release 01 Level-1B barotropic sea level products (OCN1B) and de-aliasing products (AOD1B) were calculated by GFZ until May 31, 2007 and archived at GRACE-ISDC.
    - Release 04 Level 1B de-aliasing products (AOD1B) based on improved OMCT, mass-conserving approach and harmonized land/water masks have been processed until May 31, 2007 and archived at GRACE-ISDC.

Level-2 Data Processing:

- CSR has interrupted processing of release 01 in order to accelerate release 04 reprocessing. It is planned to stop delivering RL01 from May 2007 onwards.
- GFZ has generated the last monthly release 03 products for January 2007. After exactly four years RL03 will be substituted by RL04.
- TN05 containing C20 estimates derived from SLR is periodically updated (maybe used to substitute C20 values of CSR RL01 products).

GRACE Product Distribution:

Besides historical CSR RL01, GFZ RL03 and JPL RL02 time-series and more experimental releases which are only available to the GRACE Science Team the following RL04 L2 products are available to the public:

- GFZ RL04 L2 products: GSM solutions for August 2002 until April 2007. Missing months are September and December 2002, January and June 2003 and January 2004. July 2004 until October 2004 and December 2006 are also available as constrained solutions (*GK2-*).

Corresponding background GAA, GAB, GAC and GAD products and calibrated errors (GSM*.txt) have been provided too. Details are listed in the GFZ L2 Release Notes.

- CSR RL04 L2 products: GSM solutions along with the GAC and GAD background model files and calibrated errors (GSM*.txt) are available for the period April 2002 until March 2007 (only June, July and June 2003 are missing due to accelerometer data problems). Details are listed in the CSR L2 Release Notes.
- JPL RL04 L2 products: GSM solutions along with the GAC and GAD background model files and calibrated errors (GSM*.txt) are available for the period January 2003 until November 2006 except for June 2003. Details are listed in the JPL L2 Release Notes.

Miscellaneous:

- Next GRACE Science Team Meeting (in combination with the German Special Priority Program "Mass Transport and Mass Distribution in the Earth System") will take place at GFZ Potsdam between October 15 and 17, 2007. A meeting web page will be made available soon.
- GRACE related publications which can be sorted by author or date is available at http://www.gfz-potsdam.de/pb1/op/grace/index_GRACE.html under item "Publications". This list will be regularly updated and maybe incomplete. If you are missing a publication please send an e-mail to Frank Flechtner.
- 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 .