GRACE Science Data System Monthly Report
April 2007

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Highlights:

- CSR has provided December 2006, January 2007 and February 2007 RL04 Level-2 products (for further details see GRACE Product Distribution Section below).
- **GFZ has updated the RL04 Level-2 GSM products for August, October and November 2002 as well as for January and February 2007 because these products did not contain drift rates (GRDOTA records) for C21 and S21 coefficients. Users are strongly recommended to download these products once again!**
- On April 10 the trim of the Center of Mass in all three axes has been performed on both satellites (shift of the trim masses by some tens of microns). On April 17 both GRACE satellites performed Center of Mass calibration maneuvers to verify the correct CoM positions. Results are still under investigation at JPL and CSR.

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 May 1, 2007 00:00:00 are as follows:

  A [m] = 6840741.448

  E [-] = 0.001456

  I [°] = 89.005081

  The satellites separation was 224 km on May 1, 2007 with a rate of 0.15 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:	99.9 %
GRACE-1 Science:	100.0 %
GRACE-2 Housekeeping:	100.0 %
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 2007-04-10 GRACE-A performed a +90 deg yaw for battery health reasons, this resulted in a KBR1B data loss from 03:31 till 4:07.
  - On 2007-04-12 a bias jump occurred in K-0.75Ka (ionospheric combination) for GRACE-B at 21:28:43. After a bias jump the KBR1B data may be anomalous and caution should be used when using this data in the gravity field determination process. A restart tracker was sent on 2007-04-13 at 05:47:55 which cleared this anomaly.
  - On 2007-04-17 GRACE A&B performed Center of Mass calibration maneuvers. Both spacecraft were in non-science mode from 07:05 to 23:25. Data in this interval may be degraded and caution should be used when using this data in the gravity field determination process.
  - On 2007-04-19 GRACE-B experienced 6 IPU reboots and 1 Coarse Pointing Attitude Mode. The formal clock error cutoff was raised to 25 cm to recover 2.5 hours of KBR1B data. Total KBR1B data loss is 1 hour 8 minutes

- 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_2007-04-01_X_01.dat	24.0	17280	1.13	-3.5	3.8	1
KBR1B_2007-04-02_X_01.dat	23.9	17185	1.42	-3.7	4.2	2
KBR1B_2007-04-03_X_01.dat	23.6	17010	1.56	-4.5	4.0	3
KBR1B_2007-04-04_X_01.dat	23.7	17070	1.71	-6.2	4.7	3
KBR1B_2007-04-05_X_01.dat	24.0	17280	1.80	-5.8	4.9	1
KBR1B_2007-04-06_X_01.dat	24.0	17280	1.55	-4.5	4.5	1
KBR1B_2007-04-07_X_01.dat	24.0	17280	1.39	-4.0	5.2	1
KBR1B_2007-04-08_X_01.dat	23.8	17145	1.51	-4.2	4.9	2
KBR1B_2007-04-09_X_01.dat	23.7	17099	1.41	-5.1	3.2	4
KBR1B_2007-04-10_X_01.dat	23.6	17001	1.47	-3.8	4.4	2
KBR1B_2007-04-11_X_01.dat	24.0	17280	1.40	-4.6	5.0	1
KBR1B_2007-04-12_X_01.dat	24.0	17261	1.37	-4.3	4.5	1
KBR1B_2007-04-13_X_01.dat	23.7	17097	1.43	-3.3	5.8	3
KBR1B_2007-04-14_X_01.dat	24.0	17280	1.44	-4.3	4.1	1
KBR1B_2007-04-15_X_01.dat	24.0	17280	1.79	-5.8	3.9	1
KBR1B_2007-04-16_X_01.dat	23.9	17205	1.44	-3.7	4.1	2
KBR1B_2007-04-17_X_01.dat	24.0	17280	1.93	-5.4	7.6	1
KBR1B_2007-04-18_X_01.dat	23.9	17208	1.66	-6.2	3.2	3
KBR1B_2007-04-19_X_01.dat	22.4	16140	1.63	-5.0	5.5	5
KBR1B_2007-04-20_X_01.dat	23.8	17145	1.74	-4.7	4.9	2
KBR1B_2007-04-21_X_01.dat	23.9	17205	1.71	-5.0	4.4	2
KBR1B_2007-04-22_X_01.dat	24.0	17280	1.71	-5.3	5.4	1
KBR1B_2007-04-23_X_01.dat	24.0	17280	1.52	-3.4	5.0	1
KBR1B_2007-04-24_X_01.dat	23.9	17240	1.55	-3.3	5.2	3
KBR1B_2007-04-25_X_01.dat	24.0	17280	1.65	-5.2	4.5	1
KBR1B_2007-04-26_X_01.dat	24.0	17280	1.57	-4.2	4.7	1
KBR1B_2007-04-27_X_01.dat: not yet distributed						
…						
KBR1B_2007-04-30_X_01.dat: not yet distributed						

- L1B De-aliasing Products Status
    - Release 01 Level-1B barotropic sea level products (OCN1B) and de-aliasing products (AOD1B) were calculated by GFZ until April 30, 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 April 20, 2007 and archived at GRACE-ISDC.

Level-2 Data Processing:

- CSR and GFZ interrupted processing of operational release 01 (CSR) and release 03 (GFZ) products in order to accelerate release 04 reprocessing.
- 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 February 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 February 2007 (only June, July and December 2002 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.
- Papers from the Potsdam Joint CHAMP/GRACE Science Meeting in July 2004 are now online available at http://www.gfz-potsdam.de/pb1/JCG/ .

- A list of 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.