GRACE Science Data System Monthly Report
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Highlights:

- GFZ RL03 L2 products for December 2006 and CSR RL01 L2 products for November and December 2006 delayed due to heavy workload on RL04 L2 reprocessing.
- RL04 Level-2 products from all three L2 centers for all months from launch to present except for June/July 2002 and June 2003 based on improved background models, more secular trends and full IERS2003 conventions will be made available to the public shortly. This will also include 2002 RL00 Level-1B instrument data and RL04 AOD1B products as well as updated documentation.
  A corresponding notification will be send out by the PI/Co-PI.
- Proceedings from the last GRACE Science Team Meeting in San Francisco are now available online at http://www.csr.utexas.edu/grace/GSTM by clicking on the "Past Meetings" link at the right.

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

  A [m] = 6841239.276
  E [-] = 0.001512
  I [°] = 89.020984

  The satellites separation was 191 km on January 31, 2007 with a rate of 0.52 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:	98.9 %
GRACE-1 Science:	100.0 %
GRACE-2 Housekeeping:	99.9 %
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 day 2006-12-24 at 00:45 GRACE-B experienced a GPS anomaly where the L1 and CA phase measurements were corrupted. This anomaly was cleared by a commanded reboot on 2006-12-27 01:20. For GRACE-B only GPS Range measurements were used for the orbit determination during the anomaly interval. This resulted in a significant degradation of the KBR-GPS residual. Also the formal error cutoff needed to be raised to 100 cm formal clock error for CLK1B on GRACE-B. Finally the GPS1B range measurements are corrupted for GRACE-B because the corrupted L1 phase measurement is used for the interpolation of the range measurements to GPS time. This means that the range residuals will increase by about 25 cm RMS. Caution should be applied when using the L1B data, during the GPS anomaly interval, for gravity field purposes.
  - For day 2006-12-25 see comment on 2006-12-24
  - For day 2006-12-26 see comment on 2006-12-24
  - For day 2006-12-27 see comment on 2006-12-24
  - On day 2007-01-04 GRACE-B performed OTM-4 (Orbit Trim Maneuver) from 4-JAN-2007 11:15:35.0000 till 4-JAN-2007 11:17:01 The KBR1B may be degraded from 2007-01-04 10:00:00 till 2007-01-04 16:15:00 because of removal of the -1 deg attitude bias on GRACE-B.
  - On day 2007-01-11 the GRACE-B ACC experienced a bias jump in the Science Reference Frame Y-axis at 11-JAN-2007 20:05:26.6199. After the jump the measurement remained nearly constant. An ACC power cycle on 14-JAN-2007 11:28:14 return the ACC to nominal operations. During the anomaly the data in the Y-

axis is not usable for gravity field determination purposes.

- For 2007-01-12 see note 2007-01-11
- For 2007-01-13 see note 2007-01-11
- For 2007-01-14 see note 2007-01-11
- On day 2007-01-17 GRACE-A experienced disabling of supplemental heater lines (DSHL) at 00:34 which caused temperature control on ACC to be stopped. The cool down of the ACC caused the ACC biases to change. The re-heating of the ACC returned the ACC biases to near nominal values at the beginning of day 2007-01-21. The ACC1B data may be degraded for a few days more after 2007-01-21 due to the exponential decay nature of the ACC biases change.
- For 2007-01-18 see note 2007-01-17
- For 2007-01-19 see note 2007-01-17
- For 2007-01-20 see note 2007-01-17

- 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_2006-12-22_X_01.dat	24.0	17280	1.70	-4.5	5.4	1
KBR1B_2006-12-23_X_01.dat	24.0	17280	1.69	-4.4	4.6	1
KBR1B_2006-12-24_X_01.dat	24.0	17280	34.52	-130.7	44.9	1
KBR1B_2006-12-25_X_01.dat	24.0	17280	18.88	-44.1	45.2	1
KBR1B_2006-12-26_X_01.dat	24.0	17280	16.96	-48.4	42.7	1
KBR1B_2006-12-27_X_01.dat	23.8	17145	13.31	-85.4	70.3	2
KBR1B_2006-12-28_X_01.dat	23.4	16789	1.56	-3.8	3.9	2
KBR1B_2006-12-29_X_01.dat	24.0	17260	1.80	-5.4	5.5	1
KBR1B_2006-12-30_X_01.dat	24.0	17260	1.61	-5.3	3.5	1
KBR1B_2006-12-31_X_01.dat	24.0	17260	1.62	-7.3	4.8	1
KBR1B_2007-01-01_X_01.dat	24.0	17260	2.22	-6.9	8.2	1
KBR1B_2007-01-02_X_01.dat	24.0	17260	1.39	-4.1	4.8	1

KBR1B_2007-01-03_X_01.dat	24.0	17246	2.11	-6.7	5.9	2
KBR1B_2007-01-04_X_01.dat	24.0	17233	2.46	-61.6	13.1	2
KBR1B_2007-01-05_X_01.dat	23.8	17145	1.89	-5.7	6.0	2
KBR1B_2007-01-06_X_01.dat	24.0	17280	1.74	-3.8	5.5	1
KBR1B_2007-01-07_X_01.dat	24.0	17280	1.92	-6.8	5.9	1
KBR1B_2007-01-08_X_01.dat	24.0	17280	1.77	-5.1	4.6	1
KBR1B_2007-01-09_X_01.dat	24.0	17280	2.07	-6.1	5.3	1
KBR1B_2007-01-10_X_01.dat	24.0	17280	1.95	-4.3	5.6	1
KBR1B_2007-01-11_X_01.dat	24.0	17280	1.95	-5.8	5.8	1
KBR1B_2007-01-12_X_01.dat	24.0	17280	1.63	-4.0	3.7	1
KBR1B_2007-01-13_X_01.dat	23.8	17145	1.34	-3.8	3.1	2
KBR1B_2007-01-14_X_01.dat	23.9	17232	1.60	-4.5	4.2	4
KBR1B_2007-01-15_X_01.dat	24.0	17280	1.52	-4.8	4.2	1
KBR1B_2007-01-16_X_01.dat	24.0	17266	1.28	-4.3	3.9	2
KBR1B_2007-01-17_X_01.dat	23.8	17122	1.70	-4.6	5.0	1
KBR1B_2007-01-18_X_01.dat	23.9	17242	1.81	-4.8	5.5	3
KBR1B_2007-01-19_X_01.dat	24.0	17280	1.64	-4.2	3.4	1
KBR1B_2007-01-20_X_01.dat	24.0	17280	1.46	-4.3	4.0	1
KBR1B_2007-01-21_X_01.dat	24.0	17280	1.51	-3.6	4.3	1
KBR1B_2007-01-22_X_01.dat	24.0	17280	1.56	-4.3	4.1	1
KBR1B_2007-01-23_X_01.dat	24.0	17280	1.44	-3.6	5.3	1
KBR1B_2007-01-24_X_01.dat	24.0	17280	1.47	-4.3	3.5	1
KBR1B_2007-01-25_X_01.dat	24.0	17280	1.98	-5.1	6.0	1
KBR1B_2007-01-26_X_01.dat	24.0	17280	1.59	-3.7	5.3	1
KBR1B_2007-01-27_X_01.dat	24.0	17280	1.52	-4.0	3.5	1
KBR1B_2007-01-28_X_01.dat	24.0	17280	1.62	-6.0	4.6	1
KBR1B_2007-01-29_X_01.dat	24.0	17280	1.58	-4.6	4.5	1
KBR1B_2007-01-30_X_01.dat	24.0	17280	1.57	-6.3	4.9	1
KBR1B_2007-01-31_X_01.dat	24.0	17280	1.68	-4.8	4.8	1

- L1B De-aliasing Products Status
    - Release 01 Level-1B barotropic sea level products (OCN1B) and de-aliasing products (AOD1B) were calculated by GFZ until January 31, 2007 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 for has been derived until

December 2006.

- Release 04 Level 1B de-aliasing products (AOD1B) based on improved OMCT (updated thermodynamic sea ice model and new data set for surface salinity relaxation), mass-conserving approach and harmonized land/water masks has been processed for January 2001 until January 2007 and made available to the SDS processing centers for L2 RL04 reprocessing.

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).
- Spurious slopes over land, which are due to the non-mass-conserving OMCT model output in AOD1B RL03 (used in JPL RL02 and GFZ RL03 L2 products), can and have to be corrected by re-adding the GAB product over land. A technical note TN04 was prepared and is available since May 10, 2006.

GRACE Product Distribution:

Besides more experimental releases which are only available to the GRACE Science Team the following L2 products are available to the public:

- GFZ RL03 L2 products are available for February 2003 until November 2006. Missing months are June 2003 and January 2004. July 2004 until October 2004 are also available as constrained solutions (*GK2-*). Corresponding background GAA, GAB and GAC products and calibrated errors (GSM*.txt) have been provided too. Details are listed in the GFZ L2 Release Notes.
- CSR RL01 unconstrained GSM solutions along with the GAC background model files and calibrated errors (GSM*.txt) are available for the period August 2002 – October 2006 (only June 2003 is missing due to accelerometer data problems). Details are listed in the CSR L2 Release Notes.
- JPL RL02 L2 products along with the GAB and GAC background model files and calibrated errors (GSM*.txt) are available for February 2003 until November 2005 except for June 2003 and August to October 2004. 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.
- It was decided by the PI/Co-PI that papers from the Potsdam Joint CHAMP/GRACE Science Meeting in July 2004 shall be provided on the CHAMP and GRACE web pages if the authors agree. A corresponding questionnaire was circulated and evaluated. Corresponding papers will be available soon.
- 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.