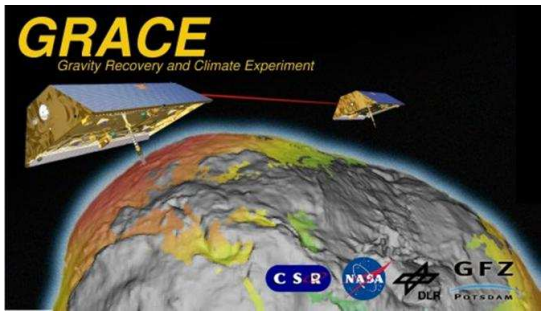
GRACE Science Data System Monthly Report August 2008



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
Markus Rothacher GFZ rothacher@gfz-potsdam.de

Highlights:

- CSR and GFZ have generated and delivered RL04 Level-2 products for July 2008.
- The next GRACE Science Team Meeting will be held on Dec 12-13 (Fri-Sat), 2008. The meeting location is the Holiday Inn Golden Gateway in San Francisco. This is the same hotel where we held the meeting in 2006. The GSTM registration portal at http://www.csr.utexas.edu/grace/GSTM/ is now open (see link at the right). Registration is required for all attendees. The meeting registration fee is $150. Housing is the responsibility of the attendees - no special arrangements have been made with any hotels. We encourage you to register as soon as possible, since it will give us a good head-count well in time to ensure good meeting logistics.

Satellite Science Relevant Events:

- Operations 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 September 1, 2008 00:00:00 are as follows:

  A [m] = 6839071.285
  E [-] = 0.001726
  I [º] = 89.007790
- The satellites separation was 187 km on September 1, 2008 with a rate of +.97 km/d. Orbit maintenance maneuver will not be needed for some months.

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

GRACE-1 Housekeeping:	99.6 %
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. Please refer to the statistics below.
- Notes:
    - On 2008-08-03 09:02:29.84 the GRACE-A Accelerometer data experienced a small jump in the linear acceleration in the Y-axis (Science Reference Frame) and also in the angular acceleration in the Z-axis (Science Reference Frame). For the ACC1B product the bias jump for the linear acceleration was corrected by adding -13.4836 nm/sec^2 from 00:00:00 until 09:02:29.84. No correction was made for the angular acceleration. The ACC1B is considered nominal after the bias correction and should be used in the gravity field determination process.
    - On 2008-08-07 GRACE-A performed a -90 deg yaw as part of the battery maintenance strategy. The KBR1B is affected or missing from 04:40 till 05:16.
    - On 2008-08-13 GRACE-B performed orbital maintenance maneuver OTM-6 at 10:16. The KBR1B data is available during the maneuver but deemed unreliable ± 5 minutes around the maneuver. During the maneuver the ACC data are saturated and were removed for the ACC1B data generation.

- **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_2008-08-01_X_01.dat	24.0	17280	1.54	-3.8	4.2	1
KBR1B_2008-08-02_X_01.dat	24.0	17280	1.71	-5.2	4.8	1
KBR1B_2008-08-03_X_01.dat	24.0	17280	1.24	-2.7	5.2	1
KBR1B_2008-08-04_X_01.dat	24.0	17280	1.31	-4.4	3.2	1
KBR1B_2008-08-05_X_01.dat	24.0	17280	1.46	-4.5	3.3	1
KBR1B_2008-08-06_X_01.dat	24.0	17280	1.50	-3.5	3.9	1
KBR1B_2008-08-07_X_01.dat	23.6	16912	1.27	-3.2	2.7	2
KBR1B_2008-08-08_X_01.dat	24.0	17280	1.18	-3.0	3.6	1
KBR1B_2008-08-09_X_01.dat	24.0	17280	1.44	-3.7	3.9	1
KBR1B_2008-08-10_X_01.dat	24.0	17280	1.31	-4.0	3.7	1
KBR1B_2008-08-11_X_01.dat	24.0	17280	1.25	-3.1	2.8	1
KBR1B_2008-08-12_X_01.dat	24.0	17280	1.43	-3.5	3.2	1
KBR1B_2008-08-13_X_01.dat	24.0	17280	4.19	-129.4	18.4	1
KBR1B_2008-08-14_X_01.dat	24.0	17280	1.39	-4.7	3.8	1
KBR1B_2008-08-15_X_01.dat	23.8	17027	1.43	-4.3	3.9	2
KBR1B_2008-08-16_X_01.dat	24.0	17280	1.54	-4.2	4.9	1
KBR1B_2008-08-17_X_01.dat	24.0	17260	1.74	-4.1	4.6	1
KBR1B_2008-08-18_X_01.dat	24.0	17260	1.55	-4.5	4.0	1
KBR1B_2008-08-19_X_01.dat	24.0	17260	1.53	-4.5	3.1	1
KBR1B_2008-08-20_X_01.dat	24.0	17260	1.44	-3.3	3.8	1
KBR1B_2008-08-21_X_01.dat	24.0	17260	1.44	-3.5	4.7	1
KBR1B_2008-08-22_X_01.dat	24.0	17260	1.33	-3.7	2.9	1
KBR1B_2008-08-23_X_01.dat	24.0	17260	1.64	-5.5	3.4	1
KBR1B_2008-08-24_X_01.dat	24.0	17260	1.50	-4.4	3.2	1
KBR1B_2008-08-25_X_01.dat	24.0	17280	1.84	-7.2	3.9	1
KBR1B_2008-08-26_X_01.dat	24.0	17260	1.50	-3.6	4.1	1
KBR1B_2008-08-27_X_01.dat	24.0	17260	1.46	-3.9	4.7	1
KBR1B_2008-08-28_X_01.dat	24.0	17260	1.67	-4.0	5.2	1
KBR1B_2008-08-29_X_01.dat	24.0	17260	1.51	-3.7	4.3	1
KBR1B_2008-08-30_X_01.dat	24.0	17260	1.79	-4.8	4.7	1
KBR1B_2008-08-31_X_01.dat	24.0	17260	1.50	-4.6	3.6	1

- Following JPL RL00 (yellow) and RL01 (green) L1B products are publicly available. June and July 2002 (red) are not provided due to accelerometer problems.

L1B data	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2002												
2003												
2004												
2005												
2006												
2007												
2008												

- The GPS satellite PRN32 (SVN23) was set "healthy" as of Feb 26, 2008. Tracking of this satellite was therefore enabled on GRACE and the Level-1B data since Feb 26, 2008 contains GPS tracking data from PRN32. Consequently, the software to convert from GRACE GPS1x format to Rinex format has been updated to handle the presence of data from PRN32. Users should download and re-install the entire Level-1 Read software suite (RELEASE_2008-03-20) from the GRACE archives. This software is backwards compatible and can process all mission data.

- L1B De-aliasing Products Status (for details see AOD1B Product Description Document):
  - Release 01: Generation has been stopped June 30, 2007.
  - Release 03: Generation has been stopped January 31, 2007.
  - Release 04: Generated until August 21, 2008.

    Note: Products for June 23, 2006 until September 20, 2007 have been reprocessed due to wrong S2 tide correction in OMCT output data. This error primarily affected the C22/S22 AOD1B RL04 coefficients in the mentioned period. New (correct) products can be recognized by the product create start and stop times which shall have a November 2007 time stamp. For further details see October 2007 newsletter.
  - Quality statistics for Release 04 products are online available at http://www.gfz-potsdam.de/pb1/op/grace/results (follow link “GRACE Atmosphere and Ocean De-aliasing Statistics).
  - Following AOD1B products are publicly available (yellow: RL01, RL03 and RL04; green: RL01 and RL04, blue: RL04 only):

AOD1B	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2002												
2003												
2004												
2005												
2006												
2007												
2008												

Level-2 Product Generation and Distribution:

- Due to the S2 problems with AOD1B RL04 between June 23, 2006 and September 20, 2007, Level-2 RL04 products in this interval have been re-processed and delivered to the archives by GFZ (details already listed in the newsletter for December 2007) and CSR. We strongly recommend that users replace the old fields with the new ones for these 16 months. For further details please refer to the January 2008 newsletter and to TN06 "Impact of change in AOD1B on RL04 monthly GSM products".
- Besides historical CSR RL01, GFZ RL03 and JPL RL02 time-series (see below) and more experimental releases which are only available to the GRACE Science Team the following RL04 L2 products are presently available to the public (green: available, yellow: in preparation; red: missing due to accelerometer data problems):

  - GFZ: GSM solutions for August 2002 until July 2008. 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.

GFZ RL04	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2002												
2003												
2004							**GK2**	**GK2**	**GK2**	**GK2**		
2005												
2006												**GK2**
2007												
2008												

  - CSR: GSM solutions along with the GAC and GAD background model files and calibrated errors (GSM*.txt) are available for the period April 2002 until July 2008. Details are listed in the CSR L2 Release Notes.

CSR RL04	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2002												
2003												
2004												
2005												
2006												
2007												
2008												

- JPL: GSM version 4.1 labeled "*JPLEM_0001_0004" along with the GAA, GAB, GAC and GAD background model files and calibrated errors (GSM*.txt) are available for the period April 2002 until June 2008. Details are listed in the JPL L2 Release Notes.

JPL RL04	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2002												
2003												
2004												
2005												
2006												
2007												
2008												

- GFZ has stopped RL03 processing (Feb 2003 until Jan 2007 available at the archives. For further details refer to the GFZ RL03 release notes for Level-2 products).
- CSR has stopped RL01 processing. (Apr. 2002 until Dec 2006 available at the archives. For further details refer to the CSR RL01 release notes for Level-2 products).
- JPL has stopped RL02 processing (January 2003 until November 2005 available at the archives. For further details refer to the JPL RL02 release notes for Level-2 products).
- TN05 containing C20 estimates derived from SLR and using GRACE RL04 standards is periodically updated.

Miscellaneous:

- 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 .
- Secure PDFs of oral and poster presentations from the Joint International GRACE Science Team Meeting and German Special Priority Program "Mass Transport and Mass Distribution in the Earth System" Symposium which took place at GFZ Potsdam between October 15 and 17, 2007 are online available at http://www.massentransporte.de/index.php?id=151 .