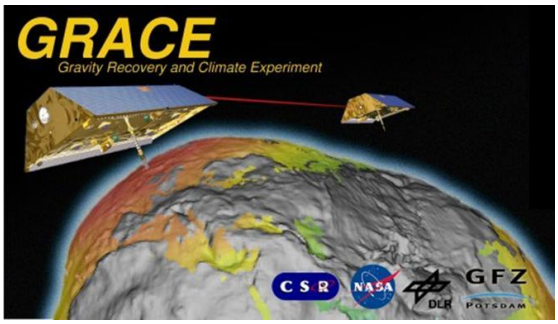
GRACE Science Data System Monthly Report
July 2010



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Highlights:

- CSR, GFZ and JPL have generated and delivered RL04 Level-2 products for June 2010.
- Online registration for the next Grace Science Team Meeting at GFZ in Potsdam on 11/12 November 2010 is now possible at http://www.gfz-potsdam.de/portal/gfz/Neuestes/Veranstaltungen/Tagungen+und+Konferenzen/2010-Conferences/GSTM-2010. There you can also find information on the coarse session program or accommodation. Abstract submission will be possible early September (deadline October 24!). Please continue to visit this site regularly for updated information.

Satellite Science Relevant Events:

- Operations in Science Mode throughout the month except for the periods highlighted in the L1B Data Processing section below.
- The GRACE-1 Brouwer mean orbital elements on August 1, 2010 00:00:00 are as follows:

  A [m] = 6836298.327
  E [-] = 0.001457
  I [°] = 89.018123
- The satellites separation was 228 km on August 2, 2010 with a rate of 0.41 km/d. Next orbit maintenance maneuver won't be necessary for some months.

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

GRACE-A Housekeeping:	100.0 %	GRACE-B Housekeeping:	100.0 %
GRACE-A Science:	100.0 %	GRACE-B 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 2010-07-07 at 13:55 a modified heater table (E) has been uploaded to GRACE-A in order to reduce the battery load. The heater set point for the ACC was lowered by 1 deg C, which caused a change in the ACC bias for all three axes. The GRACE-A ACC1B data during the ACC bias transition period can not be used in the nominal gravity field determination process and should not be included. The GRACE-A ACC bias values stabilized on 2010-07-11 00:00:00 allowing for nominal operations.
    - On 2010-07-08 at 11:48 a modified heater table (E) has been uploaded to GRACE-B in order to reduce the battery load. The heater set point for the ACC was lowered by 1 deg C, which caused a change in the ACC bias for all three axes. The GRACE-B ACC1B data during the ACC bias transition period can not be used in the nominal gravity field determination process and should not be included. The GRACE-B ACC bias values stabilized on 2010-07-11 00:00:00 allowing for nominal operations.
    - For 2010-07-08 GRACE-A see note 2010-07-07
    - For 2010-07-09 see notes 2010-07-07 and 2010-07-08
    - For 2010-07-10 see notes 2010-07-07 and 2010-07-08
    - On 2010-07-11 16:54:09 an ACC bias jump occurred on GRACE-B in the Science Reference Frame linear Y-axis and in the angular Z-axis. The ACC1B data was corrected by adding a bias of $9.662035564363908e^{-9}$ m/sec^2 prior to 11-JUL-2010 16:49:38.5611. The angular Z-axis was not corrected. The linear ACC1B data are considered nominal and should be used in the level-2 gravity field determination processing.
    - On 2010-07-15 at 12:50 a modified heater table (F) has been uploaded to GRACE-A and GRACE-B in order to reduce the battery load. The heater set point for the ACC was lowered by 5 deg C, which caused a change in the ACC bias for all three axes. The GRACE-A and GRACE-B ACC1B data during the ACC bias transition period

can not be used in the nominal gravity field determination process and should not be included. The GRACE-A and GRACE-B ACC bias values stabilized on 2010-07-19 00:00:00 allowing for nominal operations.

- For 2010-07-16 see note 2010-07-15
- For 2010-07-17 see note 2010-07-16
- For 2010-07-18 see note 2010-07-17
- On 20-JUL-2010 04:48:06.434815 an ACC bias jump occurred on GRACE-B in the Science Reference Frame linear Y-axis and in the angular Z-axis. The ACC1B data was corrected by adding a bias of $-5.507250554940088e^{-9}$ m/sec^2 prior to 20-JUL-2010 04:48:06.434815. The angular Z-axis was not corrected. The linear ACC1B data are considered nominal and should be used in the level-2 gravity field determination processing

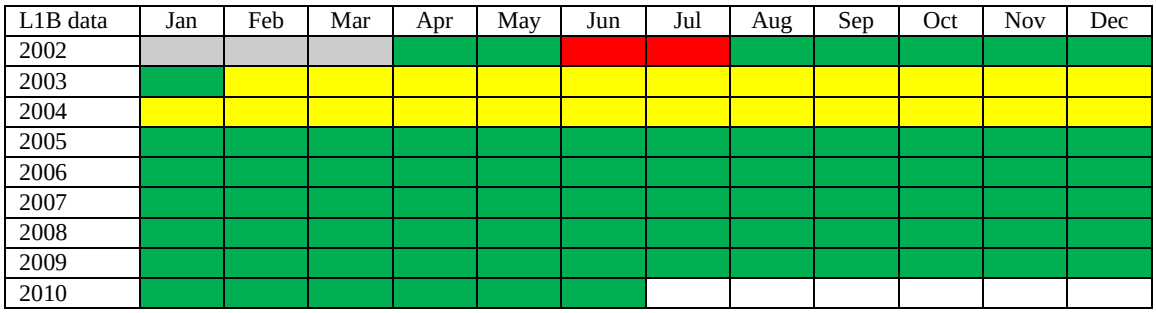
- **KBR statistics:**

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_2010-07-01_X_01.dat	24.0	17260	0.29	-1.0	0.8	1
KBR1B_2010-07-02_X_01.dat	24.0	17260	0.28	-0.8	0.9	1
KBR1B_2010-07-03_X_01.dat	24.0	17260	0.30	-0.9	1.0	1
KBR1B_2010-07-04_X_01.dat	24.0	17260	0.29	-0.9	0.9	1
KBR1B_2010-07-05_X_01.dat	24.0	17260	0.28	-1.0	0.8	1
KBR1B_2010-07-06_X_01.dat	24.0	17260	0.29	-1.1	0.8	1
KBR1B_2010-07-07_X_01.dat	24.0	17252	0.36	-1.9	0.8	1
KBR1B_2010-07-08_X_01.dat	24.0	17260	0.35	-0.8	1.5	1
KBR1B_2010-07-09_X_01.dat	24.0	17260	0.27	-1.2	0.9	1
KBR1B_2010-07-10_X_01.dat	24.0	17260	0.26	-0.8	0.9	1
KBR1B_2010-07-11_X_01.dat	24.0	17260	0.26	-0.8	1.0	1
KBR1B_2010-07-12_X_01.dat	24.0	17260	0.29	-1.2	0.9	1
KBR1B_2010-07-13_X_01.dat	24.0	17260	0.32	-1.2	1.4	1
KBR1B_2010-07-14_X_01.dat	24.0	17260	0.37	-1.5	1.3	1
KBR1B_2010-07-15_X_01.dat	23.9	17205	0.48	-2.2	1.4	2

```
KBR1B_2010-07-16_X_01.dat  24.0  17280  0.36    -1.3    1.1  1
KBR1B_2010-07-17_X_01.dat  24.0  17280  0.29    -0.7    1.4  1
KBR1B_2010-07-18_X_01.dat  24.0  17280  0.27    -0.8    0.9  1
KBR1B_2010-07-19_X_01.dat  23.9  17205  0.24    -0.8    0.7  2
KBR1B_2010-07-20_X_01.dat  24.0  17280  0.24    -1.0    0.7  1
KBR1B_2010-07-21_X_01.dat  24.0  17280  0.37    -1.4    1.2  1
KBR1B_2010-07-22_X_01.dat  23.7  17080  0.25    -0.7    1.0  3
KBR1B_2010-07-23_X_01.dat  24.0  17251  0.31    -1.0    1.2  2
KBR1B_2010-07-24_X_01.dat  24.0  17280  0.28    -1.1    0.7  1
KBR1B_2010-07-25_X_01.dat  23.9  17232  0.24    -0.9    0.9  3
KBR1B_2010-07-26_X_01.dat  24.0  17280  0.25    -0.7    0.7  1
KBR1B_2010-07-27_X_01.dat  24.0  17280  0.37    -2.0    0.8  1
KBR1B_2010-07-28_X_01.dat  24.0  17280  0.38    -0.8    1.9  1
KBR1B_2010-07-29_X_01.dat  23.9  17205  0.41    -1.7    1.7  2
KBR1B_2010-07-30_X_01.dat  24.0  17280  0.32    -1.2    0.9  1
KBR1B_2010-07-31_X_01.dat  24.0  17273  0.26    -0.9    0.8  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												
2009												
2010												

- The L1B Read software has been updated to accommodate 64-bit machines but the software will also work on 32 bit machines. Please change RELEASE_2008-03-20 to RELEASE_2010-03-31 available at http://podaac.jpl.nasa.gov/grace/data_access.html.
- 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 2, 2010 and extended to 1976-2000 (see newsletter for December 2008).
  - Quality statistics for Release 04 products are online available at http://www-app2.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
1976												
…												
1999												
2000												
2001												
2002												
2003												
2004												
2005												
2006												
2007												
2008												
2009												
2010												

Level-2 Product Generation and Distribution:

- 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 are available for August 2002 until June 2010. July 2004 until October 2004 and December 2006 are also available as constrained solutions (*GK2-*, reason is GRACE 4d repeat orbit and GPS anomaly on GRACE-B, respectively). October 2008 until April 2010 are also available as unconstrained solutions up to degree and order 60 (*GM60*, reason is GRACE 7d repeat orbit). 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										**M60**	**M60**	**M60**
2009	**M60**	**M60**	**M60**	**M60**	**M60**	**M60**	**M60**	**M60**	**M60**	**M60**	**M60**	**M60**
2010	**M60**	**M60**	**M60**	**M60**	**M60**	**M60**						

- **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 June 2010. 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												
2009												
2010												

- **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 2010. 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												
2009												
2010												

- 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:

- The following acknowledgement shall be added to any new GRACE related publication (paper, poster etc.): *Acknowledgement: We would like to thank the German Space Operations Center (GSOC) of the German Aerospace Center (DLR) for providing continuously and*

nearly 100% of the raw telemetry data of the twin GRACE satellites.

- 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" (current status: 519 papers). This list is regularly updated and maybe incomplete. If you are missing a publication please send an e-mail to Frank Flechtner (flechtne@gfz-potsdam.de).
- 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.