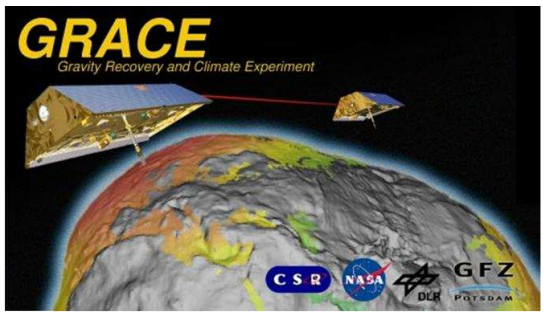
GRACE Science Data System Monthly Report August 2007



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Highlights:

- RL04 Level-2 products for July still pending due to problematic GRACE-B L1B data since 2007-07-23 caused by disabling of supplemental heater lines (DSHL) at 20:59 which caused temperature control on the accelerometer (ACC) and star camera assembly (SCA) to be stopped (see L1B comments below). May 2007 GFZ Level-2 products pending due to still incomplete GPS constellations (orbits and clocks). For further details see GRACE Product Distribution Section below.
- The final program of the Joint International GRACE Science Team Meeting and German Special Priority Program “Mass Transport and Mass Distribution in the Earth System” Symposium which will take place at GFZ Potsdam between October 15 and 17, 2007 is now online available at http://www.massentransporte.de/?130.

Satellite Science Relevant Events:

- Operation in Science Mode disturbed nearly throughout the month due to disabling of supplemental heater lines (DSHL) and a significant drop in the number of tracked GPS satellites, both experienced on GRACE-B. For details refer to the Level-1 Data Processing Section below.
- The GRACE-1 Brouwer mean orbital elements on September 1, 2007 00:00:00 are as follows:

  A [m] = 6840379.063
  E [-] = 0.001824
  I [º] = 89. 002053

  The satellites separation was 192 km on August 31, 2007 with a rate of -0.60 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:	100.0 %
GRACE-1 Science:	100.0 %
GRACE-2 Housekeeping:	99.8 %
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 (see also July 2007 newsletter)**
  - A) On day 2007-07-23 GRACE-B experienced disabling of supplemental heater lines (DSHL) at 20:59 which caused temperature control on the accelerometer (ACC) and star camera assembly (SCA) to be stopped. The cool down of the ACC caused the ACC biases to change and also cause a change in SCA alignment. A partial reheating of the ACC resulted in a new stable ACC bias on 2007-07-27 00:00. On 2007-08-04 04:15 the final ACC heat up was started and the ACC biases returned to near nominal values on 2007-08-07. During the period where reheating of the ACC occurs, the ACC1B data is degraded due to exponential decay response of the ACC bias. Caution should be used when using the ACC1B during this interval for the gravity field determination process.

    B) From 2007-07-23 20:59 till 2007-08-04 04:15 a new GRACE-B star camera alignment (QSA) was used to account for alignment change seen during this period

    C) From 2007-07-27 00:00 till 2007-08-03 11:00 the ACC had nearly stable biases but the ACC was not operating at it's nominal temperature which may degrade the data. The degradation may be due to the fact that the calibration constants used, are for a different temperature than the off nominal temperature during this period. Caution should be used when using the ACC1B during this interval for the gravity field determination process.

In summary the following periods have degraded ACC1B data

For 2007-08-01 see notes A,B,C
For 2007-08-02 see notes A,B,C
For 2007-08-03 see notes A,B,C
For 2007-08-04 see notes A,B,C
For 2007-08-05 see notes A
For 2007-08-06 see notes A
For 2007-08-07 see notes A

- On 2007-08-08 GRACE-B experienced a significant drop in the number of GPS satellites tracked at 17:00. GRACE-B returned to nominal GPS satellites tracked on 2007-08-10 19:10:50 when the IPU was rebooted. As a result the GRACE-B orbit is significantly degraded as can be seen in the increase of the KBR-GPS residuals for these days

  For 2007-08-09 see 2007-08-08

- On day 2007-08-15 GRACE-B experienced disabling of supplemental heater lines (DSHL) at 20:20 which caused temperature control on the ACC to be stopped. The cool down of the ACC caused the ACC biases to change. During the period where reheating of the ACC occurs, the ACC1B data is degraded due to exponential decay response of the ACC bias. The ACC bias stabilized on 2007-08-21 00:00:00. Caution should be used when using the ACC1B during this interval for the gravity field determination process.

  For 2007-08-17 see note 2007-08-15
  For 2007-08-18 see note 2007-08-15
  For 2007-08-19 see note 2007-08-15
  For 2007-08-20 see note 2007-08-15

- 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_2007-08-01_X_01.dat	24.0	17280	1.27	-4.0	3.4	1
KBR1B_2007-08-02_X_01.dat	24.0	17280	1.54	-5.0	4.2	1
KBR1B_2007-08-03_X_01.dat	23.8	17145	2.21	-5.7	10.6	2
KBR1B_2007-08-04_X_01.dat	24.0	17280	1.86	-4.8	5.1	1
KBR1B_2007-08-05_X_01.dat	24.0	17280	1.71	-4.2	5.1	1
KBR1B_2007-08-06_X_01.dat	24.0	17280	1.95	-7.3	8.4	1
KBR1B_2007-08-07_X_01.dat	24.0	17280	1.63	-4.8	4.3	1
KBR1B_2007-08-08_X_01.dat	24.0	17280	2.44	-5.8	11.8	1
KBR1B_2007-08-09_X_01.dat	24.0	17280	3.98	-12.9	11.9	1
KBR1B_2007-08-10_X_01.dat	23.9	17201	3.25	-9.4	9.7	2
KBR1B_2007-08-11_X_01.dat	24.0	17280	1.84	-4.7	4.8	1
KBR1B_2007-08-12_X_01.dat	24.0	17280	1.81	-5.9	4.3	1
KBR1B_2007-08-13_X_01.dat	24.0	17280	1.65	-4.2	6.7	1
KBR1B_2007-08-14_X_01.dat	24.0	17280	1.35	-5.5	4.2	1
KBR1B_2007-08-15_X_01.dat	24.0	17280	1.47	-3.5	4.2	1
KBR1B_2007-08-16_X_01.dat	24.0	17280	1.88	-5.8	5.1	1
KBR1B_2007-08-17_X_01.dat	23.7	17070	1.74	-4.5	4.5	3
KBR1B_2007-08-18_X_01.dat	24.0	17280	1.92	-5.7	5.5	1
KBR1B_2007-08-19_X_01.dat	24.0	17280	1.58	-4.0	7.7	1
KBR1B_2007-08-20_X_01.dat	24.0	17260	1.46	-4.0	4.2	2
KBR1B_2007-08-21_X_01.dat	23.8	17145	1.50	-4.2	4.2	2
KBR1B_2007-08-22_X_01.dat	24.0	17280	1.46	-4.5	3.7	1
KBR1B_2007-08-23_X_01.dat	24.0	17280	1.70	-5.6	3.7	1
KBR1B_2007-08-24_X_01.dat	not yet distributed					
…						
KBR1B_2007-08-31_X_01.dat	not yet distributed					

- Following JPL RL00 (yellow) and RL01 (green) L1B products are publicly available. June and July 2002 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												

- 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: Processed and archived until August 31, 2007.
  - 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												

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 for August 2002 until June 2007. 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. May 2007 not yet available due to still incomplete GPS constellations (orbits and clocks). 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												

- 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 2007. 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												

- JPL: 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. At present, it is not foreseen to prolong this time series. 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												

- 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 interrupted RL01 processing. It is planned to stop RL01 generation with May 2007 products (April 2002 until December 2006 already 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 is periodically updated (maybe used to substitute C20 values of CSR RL01 products).

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 .