GRACE Science Data System Monthly Report
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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
	Christoph Reigber	GFZ	reigber@gfz-potsdam.de

Highlight:

Next GRACE Science Team Meeting (GSTM) will be held in Austin on October 13/14, 2005. Registration and housing information is available online at the meeting website http://www.csr.utexas.edu/grace/GSTM. Science Team attendees should register as soon as possible!

Satellite Science Relevant Events:

- Nominal operation in Science Mode throughout the month except on June 7 when on GRACE-2 an orbit maneuver has been executed in order to reverse the drift between the GRACE satellites and on June 9 when GRACE-B experienced a coarse point mode event which resulted in 35 minutes of KBR1B data loss (see L1 processing comments below).
- The GRACE-1 Brouwer mean orbital elements on May 01, 2005 00:00:00 are as follows:

  A [m] = 6844954.492
  E [-] = 0.001592
  I [º] = 89.030526

  The satellites separation was 176 km on June 30 with a rate of 0.22 km/d. Thus, the next orbit maintenance maneuver has to be performed in about 9 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: 99.7 %
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:

- All days from 2005-05-13 till today were processed with new KBR1B software which fixed a software bug that was erroneously flagging KBR1B data points as being filled. For a more complete description see statement below.

Background:

CSR observed a significant increase in KBR1B quality flags bit 6 and bit 7 which indicate that data gaps were found in KBR1A data and these gaps were filled by interpolation such that CRN filtering can be made possible. The nominal value for the number of bits set is generally well below 100. However, on some days in April nearly 9000 (half of all KBR1B data points) were flagged. CSR honors this flag in their processing which caused significant data loss.

The software bug became only apparent after the KA-SNR on GRACE-B dipped below 450 for still unexplained reasons on 2005-02-04. In the three step process for the KBR1B production, bits 6 and 7 have different meanings. First the bits signify low SNR points and later they signify if the filling data gaps occurred. In the software the quality bits are copied over from step to step. However, in one step bits 6 and 7 were not reinitialized when the meaning changed. This was not a problem until 2005-02-04 because no low SNR points existed in the KBR1A data, so the bits remained 0. However, after 2005-02-04 many low SNR points occurred for which the bits were set to 1. These bits were then copied into the final product because no re-initialization occurred.

The software bug was fixed and we decided to reprocess all KBR1B data files since 2005-02-04. The only thing that has changed are the quality bits, all other data is unchanged. Centers that do not honor these flags will notice no difference with the newly processed files.

- On 2005-06-07 an orbit maintenance maneuver was performed at 05:45 by GRACE-B. For this maneuver the SC was not turned around, therefore KBR1B data exist throughout the maneuver. Caution should be used when using this data 15 minutes from the maneuver, the data may be significantly degraded.
- On 2005-06-09 GRACE-B experienced a coarse point mode event which resulted in 35 minutes of KBR1B data loss

The columns in the table are:

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_2005-05-13_X_01.dat	24.0	17280	1.83	-7.0	5.7	1
KBR1B_2005-05-14_X_01.dat	24.0	17280	1.84	-6.3	5.2	1
KBR1B_2005-05-15_X_01.dat	24.0	17280	2.20	-6.9	7.4	1
KBR1B_2005-05-16_X_01.dat	24.0	17280	2.18	-4.8	6.3	1
KBR1B_2005-05-17_X_01.dat	23.8	17110	2.23	-6.4	8.1	3
KBR1B_2005-05-18_X_01.dat	23.7	17059	1.71	-5.5	3.4	2
KBR1B_2005-05-19_X_01.dat	24.0	17260	1.51	-3.6	5.1	1
KBR1B_2005-05-20_X_01.dat	24.0	17260	1.91	-5.6	5.7	1
KBR1B_2005-05-21_X_01.dat	23.8	17125	1.65	-5.0	5.3	2
KBR1B_2005-05-22_X_01.dat	23.9	17205	1.75	-4.7	5.1	2
KBR1B_2005-05-23_X_01.dat	24.0	17280	2.11	-5.5	4.9	1
KBR1B_2005-05-24_X_01.dat	24.0	17280	1.78	-5.1	4.2	1
KBR1B_2005-05-25_X_01.dat	24.0	17280	1.67	-4.8	4.0	1
KBR1B_2005-05-26_X_01.dat	23.9	17205	2.54	-12.0	5.8	2
KBR1B_2005-05-27_X_01.dat	24.0	17280	1.76	-4.2	4.2	1
KBR1B_2005-05-28_X_01.dat	23.5	16907	1.81	-4.6	5.8	3
KBR1B_2005-05-29_X_01.dat	23.9	17240	1.56	-4.7	3.6	2

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KBR1B_2005-05-30_X_01.dat  24.0  17280  1.62    -4.1    4.2  1
KBR1B_2005-05-31_X_01.dat  23.8  17145  1.78    -5.1    5.4  2
KBR1B_2005-06-01_X_01.dat  24.0  17280  1.96    -4.4    6.2  1
KBR1B_2005-06-02_X_01.dat  24.0  17280  1.73    -4.3    4.7  1
KBR1B_2005-06-03_X_01.dat  23.8  17125  1.70    -4.8    4.0  2
KBR1B_2005-06-04_X_01.dat  24.0  17252  1.68    -6.5    4.1  3
KBR1B_2005-06-05_X_01.dat  23.9  17200  2.03    -4.3    5.7  4
KBR1B_2005-06-06_X_01.dat  23.9  17185  1.89    -6.9    4.6  2
KBR1B_2005-06-07_X_01.dat  24.0  17266  1.55    -4.8    5.3  2
KBR1B_2005-06-08_X_01.dat  23.8  17134  2.16    -5.7    5.9  3
KBR1B_2005-06-09_X_01.dat  23.4  16857  1.91    -5.6    5.5  2
KBR1B_2005-06-10_X_01.dat  23.7  17079  2.00    -6.9    4.7  3
KBR1B_2005-06-11_X_01.dat  24.0  17280  1.77    -4.2    5.6  1
KBR1B_2005-06-12_X_01.dat  24.0  17280  2.19    -5.2    5.5  1
KBR1B_2005-06-13_X_01.dat  24.0  17280  2.15    -6.3    6.5  1
KBR1B_2005-06-14_X_01.dat  23.9  17202  1.70    -4.8    4.8  2
KBR1B_2005-06-15_X_01.dat  24.0  17280  1.93    -4.8    8.6  1
KBR1B_2005-06-16_X_01.dat  23.8  17145  2.08    -4.9    5.6  2
KBR1B_2005-06-17_X_01.dat  24.0  17280  1.88    -5.2    6.1  1
KBR1B_2005-06-18_X_01.dat  23.8  17145  1.38    -3.7    4.0  2
KBR1B_2005-06-19_X_01.dat  24.0  17260  1.49    -4.5    3.9  1
KBR1B_2005-06-20_X_01.dat  23.9  17049  1.79    -5.4    5.2  3
KBR1B_2005-06-21_X_01.dat  24.0  17236  1.53    -4.4    4.5  2
KBR1B_2005-06-22_X_01.dat  24.0  17240  1.61    -5.3    4.8  1
KBR1B_2005-06-23_X_01.dat  24.0  17246  1.58    -3.5    4.9  2
KBR1B_2005-06-24_X_01.dat  not yet distributed
…
KBR1B_2005-06-30_X_01.dat  not yet distributed
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- Level-1B barotropic sea level products (OCN1B) and de-aliasing products (AOD1B) until June 30 were calculated by GFZ and archived at GRACE-ISDC.

Level-2 Data Processing:

- All 3 L2 centers at CSR, JPL and GFZ concentrated on improvements in the gravity model product quality and catching up on the remaining monthly field data processing.

GRACE Product Distribution:

- No Level-2 products have been delivered to the archives.

Miscellaneous:

- Selected and reviewed presentations from the July 2004 Joint CHAMP/GRACE Science Meeting will be published in a special issue of EGU´s ´Advances of Geosciences´.
- 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.