DRAFT GRACE Science Data System Monthly Report
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Satellite Science Relevant Events:

- Due to problems with the new IPU software version V149.2 on GRACE-B (different mode drops) it was decided to switch to former software version V148. This version was active from 2004-11-15 till 2004-11-25. Since then both satellites are operated without problems using V149.1.
- The long-term occultation test was active on GRACE-B between 2004-12-01 and 2004-12-09. During this time the maximum number of GPS satellites tracked was set to 9 resulting in less GPS tracking data. Due to different software problems, which did not show up during the 24 hours test in July, the test was NOT successful. Problem under investigation at JPL.
- Further events are listed in the L1B notes below.
- The GRACE-1 Brouwer mean orbital elements on January 01, 2005 00:00:00 are as follows:

  A [m] = 468675.2

  E [-] = 0.001589

  I [º] = 89.024568

  The satellites separation was 237 km on December 30 with a rate of +0.55 km/d. The next orbit maintenance maneuver will be needed in about 2 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:	99.9 %
GRACE-2 Science:	99.8 %

Level-1 Data Processing:

- Level-1B instrument data have been processed at JPL and archived at GRACE-ISDC and JPL PO.DAAC.

  Notes:
  - Days 2004-11-23, 2004-11-24 and 2004-11-25 have high KBR-GPS residuals. During these days IPU software version 148 was active on GRACE-B and less GPS tracking data was available. No clear reason has been found at this time why only these three days on V148 have higher KBR-GPS residuals.
  - On day 2004-11-26 four IPU reboots occurred on GRACE-A. Due to a procedure error the IPU rebooted every time a SCA image was taken. This resulted in about 25 minutes of KBR1B data loss.
  - On day 2004-12-01 a simultaneous Center of Mass calibration was performed.
  - On day 2004-12-09 GRACE-B experienced a DNEL (Disconnect Non-Essential Loads) event where all science instruments were turned off. Hence the small amount of KBR1B data on this day and non-operation of the KBR on 2004-12-10.
  - On day 2004-12-11 the KBR was working but only K-phase was tracked by GRACE-B. Therefore no KBR1B data is available.
  - On day 2004-12-12 The IPU on GRACE-B was rebooted restoring K and Ka phase tracking at 07:39:50.00. Prior to this time no KBR1B data available.

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_2004-11-20_X_00.dat	24.0	17280	2.04	-6.4	5.3	1
KBR1B_2004-11-21_X_00.dat	24.0	17266	1.96	-4.7	5.7	2

KBR1B_2004-11-22_X_00.dat	23.8	17145	1.85	-4.8	4.5	2
KBR1B_2004-11-23_X_00.dat	24.0	17280	3.73	-7.9	9.7	1
KBR1B_2004-11-24_X_00.dat	24.0	17280	3.96	-7.8	8.2	1
KBR1B_2004-11-25_X_00.dat	23.6	16996	3.45	-7.2	11.0	4
KBR1B_2004-11-26_X_00.dat	23.1	16623	2.09	-7.9	4.9	5
KBR1B_2004-11-27_X_00.dat	24.0	17280	2.12	-5.8	5.3	1
KBR1B_2004-11-28_X_00.dat	24.0	17280	2.09	-5.3	5.1	1
KBR1B_2004-11-29_X_00.dat	23.9	17184	2.06	-4.0	6.5	2
KBR1B_2004-11-30_X_00.dat	24.0	17260	1.97	-5.0	5.5	1
KBR1B_2004-12-01_X_00.dat	23.9	17184	2.23	-20.7	6.7	2
KBR1B_2004-12-02_X_00.dat	23.6	16959	2.01	-6.5	5.4	4
KBR1B_2004-12-03_X_00.dat	23.8	17091	2.10	-5.5	5.4	3
KBR1B_2004-12-04_X_00.dat	24.0	17241	2.58	-6.1	8.9	1
KBR1B_2004-12-05_X_00.dat	23.8	17125	2.50	-6.9	6.9	2
KBR1B_2004-12-06_X_00.dat	23.8	17125	1.89	-7.2	5.2	2
KBR1B_2004-12-07_X_00.dat	24.0	17260	2.22	-6.8	5.9	1
KBR1B_2004-12-08_X_00.dat	23.9	17187	2.27	-6.3	7.2	2
KBR1B_2004-12-09_X_00.dat	11.0	6698	2.30	-5.5	5.7	1
KBR1B_2004-12-10_X_00.dat	0.0	0	-	-	-	0
KBR1B_2004-12-11_X_00.dat	0.0	0	-	-	-	0
KBR1B_2004-12-12_X_00.dat	16.2	11674	2.08	-5.4	5.3	2
KBR1B_2004-12-13_X_00.dat	24.0	17280	1.92	-4.7	5.8	1
KBR1B_2004-12-14_X_00.dat	23.8	17131	1.90	-5.6	5.1	3
KBR1B_2004-12-15_X_00.dat	23.8	17126	2.16	-7.5	13.8	2
KBR1B_2004-12-16_X_00.dat	24.0	17280	1.90	-4.3	4.5	1
KBR1B_2004-12-17_X_00.dat	24.0	17280	1.72	-5.9	4.4	1
KBR1B_2004-12-18_X_00.dat	23.8	17145	1.77	-5.3	5.5	2
KBR1B_2004-12-19_X_00.dat	24.0	17280	1.54	-4.6	4.3	1
KBR1B_2004-12-20_X_00.dat	23.8	17130	1.99	-5.2	5.1	3
KBR1B_2004-12-21_X_00.dat	24.0	17280	1.74	-4.6	4.9	1
KBR1B_2004-12-22_X_00.dat	24.0	17264	1.86	-5.5	4.5	2
KBR1B_2004-12-23_X_00.dat	24.0	17251	1.93	-5.5	6.5	3
KBR1B_2004-12-24_X_00.dat	23.9	17186	2.76	-6.8	7.1	2
KBR1B_2004-12-25_X_00.dat	not yet processed					
…						
KBR1B_2004-12-31_X_00.dat	not yet processed					

- Level-1B barotropic sea level products (OCN1B) and de-aliasing products (AOD1B) until December 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 fields data processing.
- In particular first months of preliminary reprocessed (RL01) Level-1B data and different alternative non-tidal correction models have been tested. Results have been discussed at the SDS workshop in San Francisco on December 16 2004.

GRACE Product Distribution:

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

Miscellaneous:

- On December 24 Peter Schwintzer, head of GFZ´s section "Gravity and Earth Models" and member of the European GRACE Science Team passed away from a sudden cardiac arrest.
- 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´.
- The GRACE Science Team members who acquire GRACE products at PO.DAAC should re-visit the public GRACE data website and double check that they have all products. For the present, the password protected site is not being updated with new products, only the public site is. GRACE-ISDC does not distinguish between ST members and other users. Therefore double checking is not necessary.
- 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.