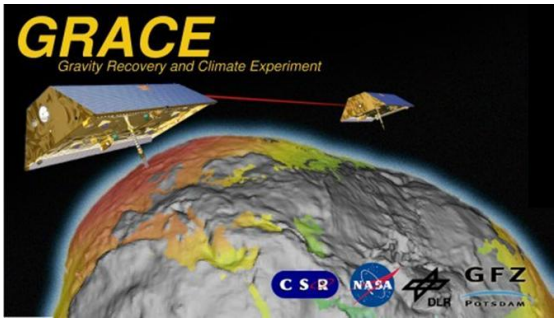
GRACE Science Data System Monthly Report December 2011



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Highlights:

- CSR has generated and delivered RL04 Level-2 products for November 2011. Due to missing accelerometer data on both satellites in the second half of November, this model was derived with data from the period 16 October till 16 November 2011. Further information is available in the CSR L2 Processing Standards Document.
- JPL has generated and delivered RL04 Level-2 products for September and October 2011.

Satellite Science Relevant Events:

- Operations in Science Mode throughout the month except for the periods highlighted in the L1B Data Processing section below.
- The actual mission status can be monitored at http://www.csr.utexas.edu/grace/operations/mission_status/.
- The GRACE-1 Brouwer mean orbital elements on January 1, 2012 00:00:00 are as follows:

  A [m] = 6827267.400
  E [-] = 0. 001669
  I [°] = 89. 011929
- The satellites separation was 232 km on December 31, 2011 with a rate of -0.70 km/d. An orbit maneuver will be needed end of March 2012.

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 2011-11-16 GRACE-A ACC was powered off at 12:34:13 to reduce the battery load. This means no nominal gravity processing is possible after 12:34:13.
  - On 2011-11-17 GRACE-B ACC was powered off at 12:00:11 to reduce the battery load.
  - On 2011-12-07 GRACE-B ACC was powered on at 11:00:39.00 while GRACE-A ACC remained powered off. Large bias drifts exist in the ACC1B data after power on. GRACE-B ACC biases stabilized on 2011-12-11 00:00:00
  - For 2011-12-09 till 2011-12-11 see note 2011-12-07
  - On 2011-12-12 GRACE-A ACC was powered on at 09:42:39.00. Large bias drifts exist in the ACC1B data after power on. GRACE-A ACC biases stabilized on 2011-12-16 00:00:00
  - For 2011-12-13 see note 2011-12-12
  - On 2011-12-14 GRACE-B powered off the MWA (Micro Wave Assembly) after a voltage drop at 05:17:54.44. The GRACE-B MWA was powered back on at 2011-12-15 06:25:24.55 but no K-band phase measurements were available after power on. Nominal Ka-band and K-band phase measurements were restored at 2011-12-16 10:09:30.00 after a GRACE-B IPU reboot. During this time interval the KBR1B data is lost.
  - On 2011-12-14 GRACE-B powered off the ACC after a voltage drop at 05:17:54.44. The GRACE-B ACC was powered back on at 2011-12-16 09:41:03.00. Large bias drifts exist in the ACC1B data after power on. GRACE-B ACC biases stabilized on 2011-12-20 00:00:00
  - For 2011-12-14 see note for 2011-12-12
  - For 2011-12-15 see notes for 2011-12-12 and 2011-12-14
  - For 2011-12-16 till 2011-12-19 see notes 2011-12-14

- 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_2011-12-01_X_01.dat	23.8	17145	0.62	-2.5	2.1	2
KBR1B_2011-12-02_X_01.dat	24.0	17280	0.46	-1.1	2.1	1
KBR1B_2011-12-03_X_01.dat	24.0	17251	0.63	-3.2	2.5	2
KBR1B_2011-12-04_X_01.dat	24.0	17251	0.62	-3.2	2.8	2
KBR1B_2011-12-05_X_01.dat	24.0	17256	0.36	-1.3	1.0	2
KBR1B_2011-12-06_X_01.dat	24.0	17280	0.37	-1.8	1.3	1
KBR1B_2011-12-07_X_01.dat	24.0	17280	0.47	-1.0	2.1	1
KBR1B_2011-12-08_X_01.dat	24.0	17280	1.10	-1.4	6.9	1
KBR1B_2011-12-09_X_01.dat	24.0	17280	0.42	-1.8	1.2	1
KBR1B_2011-12-10_X_01.dat	24.0	17280	0.47	-1.6	2.3	1
KBR1B_2011-12-11_X_01.dat	23.9	17194	0.43	-1.2	1.4	4
KBR1B_2011-12-12_X_01.dat	24.0	17280	0.37	-1.7	1.4	1
KBR1B_2011-12-13_X_01.dat	23.9	17177	0.47	-1.9	1.6	3
KBR1B_2011-12-14_X_01.dat	5.1	3710	0.27	-1.0	0.7	3
KBR1B_2011-12-15_X_01.dat	0.0	0	0.00	0.0	0.0	0
KBR1B_2011-12-16_X_01.dat	13.8	9966	0.51	-2.5	1.6	1
KBR1B_2011-12-17_X_01.dat	24.0	17280	0.32	-0.9	0.9	1
KBR1B_2011-12-18_X_01.dat	24.0	17280	0.31	-1.2	1.4	1
KBR1B_2011-12-19_X_01.dat	24.0	17256	0.39	-1.4	1.7	2
KBR1B_2011-12-20_X_01.dat	24.0	17280	0.41	-1.8	1.1	1
KBR1B_2011-12-21_X_01.dat	24.0	17280	0.31	-1.3	1.2	1
KBR1B_2011-12-22_X_01.dat	23.9	17193	0.46	-2.1	1.4	5
KBR1B_2011-12-23_X_01.dat	24.0	17280	0.38	-1.3	1.2	1
KBR1B_2011-12-24_X_01.dat	24.0	17280	0.54	-2.1	2.3	1
KBR1B_2011-12-25_X_01.dat	24.0	17280	0.37	-1.5	1.0	1
KBR1B_2011-12-26_X_01.dat	24.0	17251	0.48	-1.9	2.0	2
KBR1B_2011-12-27_X_01.dat	24.0	17280	0.39	-2.0	1.3	1

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KBR1B_2011-12-28_X_01.dat   23.7   17068   0.36     -1.1     1.4   3
KBR1B_2011-12-29_X_01.dat   23.9   17206   0.89     -1.7     5.6   4
KBR1B_2011-12-30_X_01.dat   24.0   17251   0.41     -1.1     2.0   2
KBR1B_2011-12-31_X_01.dat   24.0   17280   0.40     -1.9     1.1   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. See also comment in the Highlights Section. For January and June 2011 (blue) a significant number of accelerometer data is not available (see corresponding newsletters).

L1B data	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2002												
2003												
2004												
2005												
2006												
2007												
2008												
2009												
2010												
2011												

- 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 ftp://podaac.jpl.nasa.gov/allData/grace/sw/.
- 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 January 2, 2012 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												
2011												

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 October 2011. 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 September 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**	**M60**	**M60**	**M60**			
2011												

- **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 November 2011. 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												
2011												

- **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 October 2011. 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												
2011												

- 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 next GRACE Science Team Meeting (GSTM) will take place at the German Research Centre for Geosciences (GFZ) in Potsdam, Germany, between September 17 and 19, 2012. It will be combined with the Final Colloquium of the DFG Special Priority Program "Mass Transport and Mass Distribution in System Earth" and followed by a one day Sea Level Workshop (September 20). Further details will become available soon.
- The Proceedings of the 2011 Grace Science Team Meeting are online. See the Past Meetings link to the right at http://www.csr.utexas.edu/grace/GSTM/ .
- 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/portal/gfz/Struktur/Departments/Department+1/sec12/projects/grace/grace_publications (current status: 824 papers). This list maybe still 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.