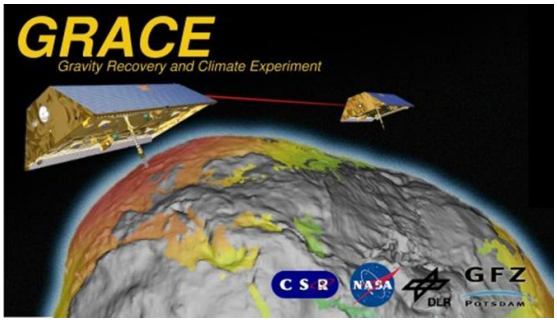
GRACE Science Data System Monthly Report September 2011



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Highlights:

- GFZ has generated and delivered RL04 Level-2 products for September 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 October 1, 2011 00:00:00 are as follows:
  A [m] = 6831417.565
  E [-] = 0.001787
  I [º] = 89.004930
- The satellites separation was 223 km on September 30, 2011 with a rate of 0.75 km/d. An orbit maneuver will be needed in about 3 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:
  - Starting on 2011-09-01, the GRACE-A and GRACE-B orbit quality has been degrading due to rapid atmospheric density variations related to increasing solar activity. The Level-1 Precision Orbit Determination (POD) parameter setup is sub-optimal for these conditions, which is the reason for the observed degradation. The level-1 team is considering to include the ACC1B data in the Level-1 POD setup to improve the orbit quality during high solar activity periods. Any improvement in Level-1 POD will be available in the Level-1 V02 release which will be made available early 2012.
  - On 2011-09-06 GRACE-A and GRACE-B executed a 90 deg yaw turn to discharge the batteries during the full sun period. The turns started 13:53 and ended at 14:38 The KBR1B data is missing in during this interval.
  - On 2011-09-11 GRACE-A and GRACE-B executed a 90 deg yaw turn to discharge the batteries during the full sun period. The turns started 15:47 and ended at 16:12 The KBR1B data is missing in during this interval.
  - On 2011-09-12 GRACE-B entered coarse pointing mode at 10:52 due to invalid star camera data. Nominal operations were restored after a commanded IPU reboot at 13:05. KBR1B data during this interval is not reliable or missing.
  - On 2011-09-17 GRACE-A and GRACE-B executed a 90 deg yaw turn to discharge the batteries during the full sun period. The turns started 15:29 and ended at 15:56 The KBR1B data is missing in during this interval.
  - On 2011-09-21 GRACE A&B performed Center of mass calibration maneuvers. Both spacecraft were in non-science mode from 16:25 to 2011-09-22 02:04. Data in this interval may be degraded and caution should be used when using this data in the gravity field determination process.
  - For 2011-09-22 See note 2011-09-21
  - On 2011-09-23 GRACE-A and GRACE-B executed a 90 deg yaw turn to discharge the batteries during the full sun period. The turns started 15:16 and ended at 15:50 The KBR1B data is missing in during this interval.
- **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_2011-09-01_X_01.dat	24.0	17280	0.29	-1.1	1.1	1
KBR1B_2011-09-02_X_01.dat	24.0	17280	0.30	-0.8	1.5	1
KBR1B_2011-09-03_X_01.dat	24.0	17280	0.41	-1.5	1.7	1
KBR1B_2011-09-04_X_01.dat	24.0	17280	0.63	-1.4	4.4	1
KBR1B_2011-09-05_X_01.dat	24.0	17280	0.35	-1.9	0.8	1
KBR1B_2011-09-06_X_01.dat	23.2	16738	0.46	-1.4	1.9	2
KBR1B_2011-09-07_X_01.dat	24.0	17280	0.32	-2.0	0.9	1
KBR1B_2011-09-08_X_01.dat	24.0	17280	0.36	-0.9	1.8	1
KBR1B_2011-09-09_X_01.dat	24.0	17280	0.69	-1.8	3.5	1
KBR1B_2011-09-10_X_01.dat	24.0	17280	0.70	-2.8	2.5	1
KBR1B_2011-09-11_X_01.dat	23.6	16988	0.75	-4.0	3.0	2
KBR1B_2011-09-12_X_01.dat	22.3	16053	6.66	-50.3	97.7	3
KBR1B_2011-09-13_X_01.dat	24.0	17280	0.52	-2.0	1.8	1
KBR1B_2011-09-14_X_01.dat	23.8	17145	0.49	-1.7	2.5	2
KBR1B_2011-09-15_X_01.dat	24.0	17257	0.50	-2.0	2.4	2
KBR1B_2011-09-16_X_01.dat	24.0	17280	0.39	-1.4	1.6	1
KBR1B_2011-09-17_X_01.dat	23.5	16015	0.79	-2.8	2.4	4
KBR1B_2011-09-18_X_01.dat	23.8	17145	0.43	-1.2	2.1	2
KBR1B_2011-09-19_X_01.dat	24.0	17256	0.50	-1.4	1.8	2
KBR1B_2011-09-20_X_01.dat	24.0	17280	0.61	-1.5	3.8	1
KBR1B_2011-09-21_X_01.dat	24.0	17280	0.60	-2.1	2.4	1
KBR1B_2011-09-22_X_01.dat	24.0	17280	0.44	-0.8	2.2	1
KBR1B_2011-09-23_X_01.dat	23.3	16799	0.70	-2.5	2.6	3
KBR1B_2011-09-24_X_01.dat	24.0	17280	0.99	-2.7	5.6	1
KBR1B_2011-09-25_X_01.dat	24.0	17280	0.67	-4.0	1.8	1
KBR1B_2011-09-26_X_01.dat	24.0	17280	1.67	-4.5	7.0	1
KBR1B_2011-09-27_X_01.dat	24.0	17280	1.26	-3.6	5.7	1
KBR1B_2011-09-28_X_01.dat	24.0	17280	0.72	-2.4	3.7	1
KBR1B_2011-09-29_X_01.dat	24.0	17280	0.51	-1.6	1.4	1
KBR1B_2011-09-30_X_01.dat	24.0	17280	0.57	-2.0	2.1	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) no accelerometer data are 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 October 10, 2011 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 September 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 August 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 August 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 Proceedings of the 2011 Grace Science Team Meeting are now 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: 801 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.