

Release Notes for GFZ GRACE Level-2 Products - version RL05

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Important Remark (as of 16.06.2016):

*Due to a processing bug, the originally published Level-2 GSM product for February 2016 (labelled 'GSM-2_2016029-2016060_0032_EIGEN_G---_005a') turned out to be erroneous. A correct product has been generated which has replaced the previous wrong one in the GRACE archives ISDC and PO.DAAC. **Please make sure that you use the correct version of the GSM product for February 2016.** This can be checked by looking at the product generation date (to be found in the record 'FIRST' of the Level-2 product file) which should be '20160615'. Note that only the GSM files (*.gz and *.txt) are affected; the corresponding GAX products remain unchanged.*

Important Remark (as of 26.09.2014):

Due to the reprocessing of AOD1B products for the period June 25th 2013 till July 27th 2014 (see <http://www.gfz-potsdam.de/AOD1B> for further information) the GRACE Level-2 products for the period June 2013 till June 2014 have been reprocessed as well. The reprocessed products can be recognized by a product generation date '20140917' or later (the date can be found in the record 'FIRST' of Level-2 product files).

Important Remark (as of 17.12.2013):

*Based on recent findings showing differences between the GFZ RL05 time series compared to CSR's and JPL's RL05 time series, in particular visible in trend estimates including data after 2009, GFZ has **reprocessed** the whole **RL05** time series and **redistributed** it as **RL05a** time series. Note that only GSM products are affected, all GAX products remain unchanged and need not to be replaced. When making your request at the ISDC retrieval pages, the RL05a GSM products can be found under the same revision number (i.e. "5") as the RL05 GSM products. Correspondingly, at PO.DAAC archive, the RL05a products can be found in the directory "allData/grace/L2/GFZ/RL05". **The RL05a GSM products are distinguishable by the string "_005a" (instead of "_0005") at the end of the product name.***

Users are strongly advised to use GFZ RL05a for all new analysis and to replace old GFZ RL05 GSM products! The missing products of the year 2002 (soon to be delivered) and all upcoming products starting with October 2013 will only be delivered as RL05a products, i.e. the **RL05** time-series **will not be continued**.

The difference between RL05 and RL05a is the treatment of orbit parameters in the final processing step when gravity field parameters are estimated: orbit parameters are fixed in RL05 and free in

RL05a. Further details and background has been presented at the GRACE Science Team Meeting 2013; the presentation is available in the meeting proceedings which can be found here: <http://www.csr.utexas.edu/grace/GSTM/2013/proceedings.html> (session "Introduction and GRACE SDS", file "06_Flechtner_GFZ_RL05.pdf").

Note 1: C20 values of the RL05a time series are not useful and have to be replaced, e.g. using values from GRACE Technical Note 07!

Note 2: The "GFZ GRACE Level-2 Processing Standards Document for Level-2 Product Release 0005" is still valid for RL05a (except for the product name description (chapter I.1, p. 6), see information above about new GSM product name for RL05a).

General Remarks:

- A RL05/RL05a time series has been reprocessed and is currently available at the two GRACE archives GFZ/ISDC (Information System and Data Centre) and JPL/PO.DAAC (Physical Oceanography Distributed Active Archive Center) for the period of April 2002 until June 2017.
- Starting with October 2013, RL05a substitutes RL05 (RL05 will not be produced anymore).
- Starting with May 2012, RL05 substitutes RL04 (RL04 will not be produced anymore).
- Details on modifications wrt RL04 can be found in the "GFZ GRACE Level-2 Processing Standards Document for Level-2 Product Release 0005" published as GFZ Scientific Technical Report which can be downloaded from the GRACE archives or following this link: <http://ebooks.gfz-potsdam.de/pubman/item/escidoc:108022>
- In contrast to RL04, the RL05 C20 values are much more plausible (i.e. much closer SLR-based values such as CSR's RL04 SLR time series). Therefore, we recommend not to replace the RL05 C20 values but directly use them as given. **Note that this is not true anymore for RL05a! RL05a C20 values should be replaced by e.g. GRACE Technical Note 07.**
- If any results based on the GFZ RL05/RL05a time series are published, users are kindly requested to cite the following reference:

Dahle, Christoph; Flechtner, Frank; Gruber, Christian; König, Daniel; König, Rolf; Michalak, Grzegorz; Neumayer, Karl-Hans (2012): *GFZ GRACE Level-2 Processing Standards Document for Level-2 Product Release 0005*, (Scientific Technical Report STR12/02 – Data, Revised Edition, January 2013), Potsdam, 21 p. DOI: 10.2312/GFZ.b103-1202-25

Products:

As for RL04, nominally 6 Level-2 product files are available for each month. For example, for January 2005 the available products in case of RL05a are:

- GSM-2_2005001-2005031_0031_EIGEN_G---_005a.gz
- GSM-2_2005001-2005031_0031_EIGEN_G---_005a.txt
- GAA-2_2005001-2005031_0031_EIGEN_G---_0005.gz
- GAB-2_2005001-2005031_0031_EIGEN_G---_0005.gz

- GAC-2_2005001-2005031_0031_EIGEN_G---_0005.gz
- GAD-2_2005001-2005031_0031_EIGEN_G---_0005.gz

Update (as of 13.10.2015):

In addition to the products mentioned above, full variance-covariance matrices for the whole RL05a time series are available on request. The covariance information is based on formal errors and includes only gravity field parameters (up to degree and order 90). These products are labeled as CSM-product, e.g.:

- CSM-2_2005001-2005031_0031_EIGEN_G---_005a.gz

Each CSM-product has a filesize of ~143MB (zipped). For requests and more information about the product format please send an email to: dahle@gfz-potsdam.de

Note:

Additionally to the standard monthly solutions, GFZ now also provides weekly RL05/RL05a solutions (aligned to GPS weeks) which contain spherical harmonic coefficients complete up to degree and order 30. Currently, available weekly solutions cover the time span from 2003/01/05 till 2013/07/27. The weekly Level-2 products (GSM + GAx files) can also be downloaded at ISDC and PO.DAAC. When making your request at the ISDC retrieval pages, please choose “GFZ Potsdam weekly” as “Processing Facility” to obtain these products. At PO.DAAC, they can be found in the directory “allData/grace/L2/GFZ/RL05_WEEKLY”. Weekly products can be identified by the string “GW30” instead of “G---” in the product name.

The following table shows the currently available monthly Level-2 RL05a products, where

- **Release Date** is chronologically starting from first provision of RL05a data till today.
- **Product Name** is in agreement with the GRACE Level-2 Gravity Field Product User Handbook, Rev. 2.3.
- **Month** is the time span for which the product is valid (usually one full month).
- **Days** is the accumulated number of actual days within *Period* where GRACE data has been incorporated in the Level-2 processing.
- **Max. d/o** is the maximum degree and order for the corresponding product. Nominally this is 90x90, but it might be lower in case of GRACE repeat cycles or missing instrument data.
- In the latter case or other exceptional occurrences, corresponding **Comments** are provided which are explained in detail further below.
- **GAx** is yes, if the corresponding GAA, GAB, GAC and GAD products are available, too (nominal case).

Release Date	Product Name	Month	Days	Max. d/o	GAX	Comments
01.09.2017	GSM-2_2017143-2017180_0038_EIGEN_G---_005a	06/2017	36.53	90x90	Yes	9), 11), 12)
01.09.2017	GSM-2_2017122-2017142_0021_EIGEN_G---_005a	05/2017	19.71	90x90	Yes	9), 12)
01.09.2017	GSM-2_2017100-2017128_0029_EIGEN_G---_005a	04/2017	28.69	90x90	Yes	9), 11), 12)
01.09.2017	GSM-2_2017076-2017104_0029_EIGEN_G---_005a	03/2017	27.56	90x90	Yes	9), 11), 12)
02.06.2017	GSM-2_2017007-2017033_0027_EIGEN_G---_005a	01/2017	25.09	90x90	Yes	9), 11)
20.04.2017	GSM-2_2016346-2017006_0027_EIGEN_G---_005a	12/2016	26.84	90x90	Yes	9), 11)
20.04.2017	GSM-2_2016319-2016344_0021_EIGEN_G---_005a	11/2016	19.39	90x90	Yes	9), 11)
08.12.2016	GSM-2_2016221-2016247_0027_EIGEN_G---_005a	08/2016	25.64	90x90	Yes	10)
17.10.2016	GSM-2_2016183-2016211_0029_EIGEN_G---_005a	07/2016	28.37	90x90	Yes	
22.09.2016	GSM-2_2016153-2016182_0030_EIGEN_G---_005a	06/2016	29.72	90x90	Yes	
30.08.2016	GSM-2_2016129-2016152_0024_EIGEN_G---_005a	05/2016	22.82	90x90	Yes	
16.06.2016	GSM-2_2016029-2016060_0032_EIGEN_G---_005a	02/2016	31.86	90x90	Yes	9)
01.06.2016	GSM-2_2016061-2016091_0031_EIGEN_G---_005a	03/2016	30.01	90x90	Yes	
16.03.2016	GSM-2_2016004-2016028_0025_EIGEN_G---_005a	01/2016	24.23	90x90	Yes	9)
23.02.2016	GSM-2_2015346-2016003_0023_EIGEN_G---_005a	12/2015	22.62	90x90	Yes	9)
12.11.2015	GSM-2_2015244-2015270_0027_EIGEN_G---_005a	09/2015	26.40	90x90	Yes	
26.10.2015	GSM-2_2015213-2015243_0031_EIGEN_G---_005a	08/2015	30.74	90x90	Yes	
13.10.2015	GSM-2_2015180-2015212_0027_EIGEN_G---_005a	07/2015	25.28	90x90	Yes	8)
13.10.2015	GSM-2_2015102-2015131_0030_EIGEN_G---_005a	05/2015	29.24	90x90	Yes	7)
16.06.2015	GSM-2_2015091-2015120_0030_EIGEN_G---_005a	04/2015	29.95	90x90	Yes	
28.05.2015	GSM-2_2015060-2015090_0031_EIGEN_GOL-_005a	03/2015	30.63	90x30	Yes	6)
28.05.2015	GSM-2_2015060-2015090_0031_EIGEN_G---_005a	03/2015	30.63	90x90	Yes	
27.04.2015	GSM-2_2015032-2015059_0028_EIGEN_GOL-_005a	02/2015	27.21	90x30	Yes	6)
27.04.2015	GSM-2_2015032-2015059_0028_EIGEN_GK2-_005a	02/2015	27.21	90x90	Yes	1)
09.04.2015	GSM-2_2015013-2015031_0019_EIGEN_GOL-_005a	01/2015	18.61	90x30	Yes	6)
09.04.2015	GSM-2_2015013-2015031_0019_EIGEN_GK2-_005a	01/2015	18.61	90x90	Yes	1)
21.01.2015	GSM-2_2014305-2014334_0030_EIGEN_G---_005a	11/2014	29.84	90x90	Yes	
19.12.2014	GSM-2_2014274-2014304_0031_EIGEN_G---_005a	10/2014	30.78	90x90	Yes	
18.11.2014	GSM-2_2014244-2014273_0030_EIGEN_G---_005a	09/2014	28.39	90x90	Yes	
12.11.2014	GSM-2_2014213-2014243_0031_EIGEN_G---_005a	08/2014	30.13	90x90	Yes	
26.09.2014	GSM-2_2014152-2014175_0024_EIGEN_G---_005a	06/2014	23.54	90x90	Yes	
26.09.2014	GSM-2_2014121-2014151_0031_EIGEN_G---_005a	05/2014	30.68	90x90	Yes	
26.09.2014	GSM-2_2014091-2014120_0030_EIGEN_G---_005a	04/2014	28.25	90x90	Yes	
26.09.2014	GSM-2_2014060-2014090_0031_EIGEN_G---_005a	03/2014	30.27	90x90	Yes	
26.09.2014	GSM-2_2014001-2014017_0017_EIGEN_GK2-_005a	01/2014	16.15	90x90	Yes	1)
26.09.2014	GSM-2_2013335-2013365_0028_EIGEN_GK2-_005a	12/2013	27.18	90x90	Yes	1)
26.09.2014	GSM-2_2013305-2013334_0030_EIGEN_G---_005a	11/2013	29.16	90x90	Yes	
26.09.2014	GSM-2_2013274-2013304_0031_EIGEN_G---_005a	10/2013	30.36	90x90	Yes	
26.09.2014	GSM-2_2013182-2013212_0031_EIGEN_G---_005a	07/2013	31.00	90x90	Yes	
26.09.2014	GSM-2_2013152-2013181_0030_EIGEN_G---_005a	06/2013	28.63	90x90	Yes	
02.06.2014	GSM-2_2002335-2002365_0029_EIGEN_G---_005a	12/2002	21.02	90x90	Yes	
02.06.2014	GSM-2_2002305-2002334_0027_EIGEN_G---_005a	11/2002	23.70	90x90	Yes	
02.06.2014	GSM-2_2002274-2002304_0030_EIGEN_G---_005a	10/2002	28.18	90x90	Yes	
02.06.2014	GSM-2_2002244-2002273_0021_EIGEN_GK2-_005a	09/2002	18.20	90x90	Yes	1)
02.06.2014	GSM-2_2002213-2002243_0031_EIGEN_G---_005a	08/2002	28.23	90x90	Yes	
02.06.2014	GSM-2_2002122-2002137_0013_EIGEN_G---_005a	05/2002	12.91	90x90	Yes	
02.06.2014	GSM-2_2002094-2002120_0024_EIGEN_G---_005a	04/2002	17.90	90x90	Yes	
17.12.2013	GSM-2_2013121-2013151_0031_EIGEN_G---_005a	05/2013	30.68	90x90	Yes	
17.12.2013	GSM-2_2013101-2013120_0020_EIGEN_G---_005a	04/2013	19.46	90x90	Yes	
17.12.2013	GSM-2_2013032-2013057_0026_EIGEN_G---_005a	02/2013	25.35	90x90	Yes	
17.12.2013	GSM-2_2013001-2013031_0031_EIGEN_G---_005a	01/2013	30.50	90x90	Yes	
17.12.2013	GSM-2_2012336-2012366_0029_EIGEN_G---_005a	12/2012	28.49	90x90	Yes	
17.12.2013	GSM-2_2012311-2012335_0025_EIGEN_G---_005a	11/2012	24.41	90x90	Yes	
17.12.2013	GSM-2_2012245-2012269_0025_EIGEN_G---_005a	09/2012	24.19	90x90	Yes	

17.12.2013	GSM-2_2012214-2012244_0031_EIGEN_G---_005a	08/2012	30.75	90x90	yes	
17.12.2013	GSM-2_2012183-2012213_0031_EIGEN_G---_005a	07/2012	30.11	90x90	yes	
17.12.2013	GSM-2_2012153-2012182_0030_EIGEN_GK2-_005a	06/2012	29.94	90x90	yes	1)
17.12.2013	GSM-2_2012080-2012109_0030_EIGEN_GK2-_005a	04/2012	29.90	90x90	yes	1), 4)
17.12.2013	GSM-2_2012061-2012091_0031_EIGEN_G---_005a	03/2012	29.42	90x90	yes	
17.12.2013	GSM-2_2012032-2012060_0029_EIGEN_G---_005a	02/2012	27.90	90x90	yes	
17.12.2013	GSM-2_2012001-2012031_0031_EIGEN_G---_005a	01/2012	30.80	90x90	yes	
17.12.2013	GSM-2_2011347-2012011_0027_EIGEN_G---_005a	12/2011	26.95	90x90	yes	3)
17.12.2013	GSM-2_2011289-2011319_0031_EIGEN_G---_005a	11/2011	30.58	90x90	yes	2)
17.12.2013	GSM-2_2011274-2011304_0031_EIGEN_G---_005a	10/2011	30.58	90x90	yes	
17.12.2013	GSM-2_2011244-2011273_0030_EIGEN_G---_005a	09/2011	29.17	90x90	yes	
17.12.2013	GSM-2_2011213-2011243_0031_EIGEN_G---_005a	08/2011	30.61	90x90	yes	
17.12.2013	GSM-2_2011186-2011212_0027_EIGEN_G---_005a	07/2011	26.78	90x90	yes	
17.12.2013	GSM-2_2011121-2011151_0031_EIGEN_G---_005a	05/2011	29.28	90x90	yes	
17.12.2013	GSM-2_2011091-2011120_0030_EIGEN_G---_005a	04/2011	28.93	90x90	yes	
17.12.2013	GSM-2_2011060-2011090_0031_EIGEN_G---_005a	03/2011	27.81	90x90	yes	
17.12.2013	GSM-2_2011039-2011059_0021_EIGEN_G---_005a	02/2011	20.73	90x90	yes	
17.12.2013	GSM-2_2010335-2010361_0027_EIGEN_G---_005a	12/2010	26.92	90x90	yes	
17.12.2013	GSM-2_2010305-2010334_0030_EIGEN_G---_005a	11/2010	29.70	90x90	yes	
17.12.2013	GSM-2_2010274-2010304_0031_EIGEN_G---_005a	10/2010	30.11	90x90	yes	
17.12.2013	GSM-2_2010244-2010273_0030_EIGEN_G---_005a	09/2010	29.70	90x90	yes	
17.12.2013	GSM-2_2010213-2010243_0031_EIGEN_G---_005a	08/2010	30.52	90x90	yes	
17.12.2013	GSM-2_2010182-2010212_0031_EIGEN_G---_005a	07/2010	30.85	90x90	yes	
17.12.2013	GSM-2_2010152-2010181_0030_EIGEN_G---_005a	06/2010	28.92	90x90	yes	
17.12.2013	GSM-2_2010121-2010151_0031_EIGEN_G---_005a	05/2010	30.38	90x90	yes	
17.12.2013	GSM-2_2010091-2010120_0030_EIGEN_G---_005a	04/2010	29.86	90x90	yes	
17.12.2013	GSM-2_2010060-2010090_0031_EIGEN_G---_005a	03/2010	30.48	90x90	yes	
17.12.2013	GSM-2_2010032-2010059_0028_EIGEN_G---_005a	02/2010	27.90	90x90	yes	
17.12.2013	GSM-2_2010001-2010031_0031_EIGEN_G---_005a	01/2010	30.97	90x90	yes	
17.12.2013	GSM-2_2009335-2009365_0031_EIGEN_G---_005a	12/2009	30.47	90x90	yes	
17.12.2013	GSM-2_2009305-2009334_0030_EIGEN_G---_005a	11/2009	29.98	90x90	yes	
17.12.2013	GSM-2_2009274-2009304_0031_EIGEN_G---_005a	10/2009	30.76	90x90	yes	
17.12.2013	GSM-2_2009244-2009273_0030_EIGEN_G---_005a	09/2009	29.85	90x90	yes	
17.12.2013	GSM-2_2009213-2009243_0031_EIGEN_G---_005a	08/2009	29.86	90x90	yes	
17.12.2013	GSM-2_2009182-2009212_0031_EIGEN_G---_005a	07/2009	30.44	90x90	yes	
17.12.2013	GSM-2_2009152-2009181_0030_EIGEN_G---_005a	06/2009	29.20	90x90	yes	
17.12.2013	GSM-2_2009121-2009151_0031_EIGEN_G---_005a	05/2009	30.98	90x90	yes	
17.12.2013	GSM-2_2009091-2009120_0030_EIGEN_G---_005a	04/2009	29.82	90x90	yes	
17.12.2013	GSM-2_2009060-2009090_0031_EIGEN_G---_005a	03/2009	29.55	90x90	yes	
17.12.2013	GSM-2_2009032-2009059_0028_EIGEN_G---_005a	02/2009	27.92	90x90	yes	
17.12.2013	GSM-2_2009001-2009031_0031_EIGEN_G---_005a	01/2009	30.63	90x90	yes	
17.12.2013	GSM-2_2008336-2008366_0031_EIGEN_G---_005a	12/2008	30.84	90x90	yes	
17.12.2013	GSM-2_2008306-2008335_0030_EIGEN_G---_005a	11/2008	29.18	90x90	yes	
17.12.2013	GSM-2_2008275-2008305_0031_EIGEN_G---_005a	10/2008	30.88	90x90	yes	
17.12.2013	GSM-2_2008245-2008274_0030_EIGEN_G---_005a	09/2008	29.27	90x90	yes	
17.12.2013	GSM-2_2008214-2008244_0031_EIGEN_G---_005a	08/2008	30.72	90x90	yes	
17.12.2013	GSM-2_2008183-2008213_0031_EIGEN_G---_005a	07/2008	30.37	90x90	yes	
17.12.2013	GSM-2_2008153-2008182_0030_EIGEN_G---_005a	06/2008	29.89	90x90	yes	
17.12.2013	GSM-2_2008122-2008152_0031_EIGEN_G---_005a	05/2008	30.74	90x90	yes	
17.12.2013	GSM-2_2008092-2008121_0030_EIGEN_G---_005a	04/2008	29.90	90x90	yes	
17.12.2013	GSM-2_2008061-2008091_0031_EIGEN_G---_005a	03/2008	30.65	90x90	yes	
17.12.2013	GSM-2_2008032-2008060_0029_EIGEN_G---_005a	02/2008	28.50	90x90	yes	
17.12.2013	GSM-2_2008001-2008031_0031_EIGEN_G---_005a	01/2008	30.95	90x90	yes	
17.12.2013	GSM-2_2007335-2007365_0031_EIGEN_G---_005a	12/2007	30.79	90x90	yes	
17.12.2013	GSM-2_2007305-2007334_0030_EIGEN_G---_005a	11/2007	29.39	90x90	yes	

17.12.2013	GSM-2_2007274-2007304_0031_EIGEN_G---_005a	10/2007	28.72	90x90	yes	
17.12.2013	GSM-2_2007244-2007273_0030_EIGEN_G---_005a	09/2007	29.63	90x90	yes	
17.12.2013	GSM-2_2007213-2007243_0031_EIGEN_G---_005a	08/2007	30.83	90x90	yes	
17.12.2013	GSM-2_2007182-2007212_0031_EIGEN_G---_005a	07/2007	30.89	90x90	yes	
17.12.2013	GSM-2_2007152-2007181_0030_EIGEN_G---_005a	06/2007	29.38	90x90	yes	
17.12.2013	GSM-2_2007121-2007151_0031_EIGEN_G---_005a	05/2007	30.19	90x90	yes	
17.12.2013	GSM-2_2007091-2007120_0030_EIGEN_G---_005a	04/2007	28.66	90x90	yes	
17.12.2013	GSM-2_2007060-2007090_0031_EIGEN_G---_005a	03/2007	30.90	90x90	yes	
17.12.2013	GSM-2_2007032-2007059_0028_EIGEN_G---_005a	02/2007	27.71	90x90	yes	
17.12.2013	GSM-2_2007001-2007031_0031_EIGEN_G---_005a	01/2007	30.85	90x90	yes	
17.12.2013	GSM-2_2006335-2006365_0028_EIGEN_G---_005a	12/2006	27.84	90x90	yes	
17.12.2013	GSM-2_2006305-2006334_0030_EIGEN_G---_005a	11/2006	29.97	90x90	yes	
17.12.2013	GSM-2_2006274-2006304_0031_EIGEN_G---_005a	10/2006	28.95	90x90	yes	
17.12.2013	GSM-2_2006244-2006273_0030_EIGEN_G---_005a	09/2006	27.32	90x90	yes	
17.12.2013	GSM-2_2006213-2006243_0031_EIGEN_G---_005a	08/2006	30.49	90x90	yes	
17.12.2013	GSM-2_2006182-2006212_0031_EIGEN_G---_005a	07/2006	30.23	90x90	yes	
17.12.2013	GSM-2_2006152-2006181_0028_EIGEN_G---_005a	06/2006	26.16	90x90	yes	
17.12.2013	GSM-2_2006121-2006151_0031_EIGEN_G---_005a	05/2006	30.50	90x90	yes	
17.12.2013	GSM-2_2006091-2006120_0030_EIGEN_G---_005a	04/2006	29.43	90x90	yes	
17.12.2013	GSM-2_2006060-2006090_0030_EIGEN_G---_005a	03/2006	28.98	90x90	yes	
17.12.2013	GSM-2_2006032-2006059_0028_EIGEN_G---_005a	02/2006	26.75	90x90	yes	
17.12.2013	GSM-2_2006001-2006031_0031_EIGEN_G---_005a	01/2006	29.77	90x90	yes	
17.12.2013	GSM-2_2005335-2005365_0027_EIGEN_G---_005a	12/2005	25.87	90x90	yes	
17.12.2013	GSM-2_2005305-2005334_0030_EIGEN_G---_005a	11/2005	29.41	90x90	yes	
17.12.2013	GSM-2_2005274-2005304_0031_EIGEN_G---_005a	10/2005	29.64	90x90	yes	
17.12.2013	GSM-2_2005244-2005273_0030_EIGEN_G---_005a	09/2005	29.44	90x90	yes	
17.12.2013	GSM-2_2005213-2005243_0030_EIGEN_G---_005a	08/2005	29.47	90x90	yes	
17.12.2013	GSM-2_2005182-2005212_0031_EIGEN_G---_005a	07/2005	30.56	90x90	yes	
17.12.2013	GSM-2_2005152-2005181_0030_EIGEN_G---_005a	06/2005	29.55	90x90	yes	
17.12.2013	GSM-2_2005121-2005151_0030_EIGEN_G---_005a	05/2005	29.19	90x90	yes	
17.12.2013	GSM-2_2005091-2005120_0030_EIGEN_G---_005a	04/2005	29.36	90x90	yes	
17.12.2013	GSM-2_2005060-2005090_0028_EIGEN_G---_005a	03/2005	26.89	90x90	yes	
17.12.2013	GSM-2_2005032-2005059_0028_EIGEN_G---_005a	02/2005	26.56	90x90	yes	
17.12.2013	GSM-2_2005001-2005031_0031_EIGEN_G---_005a	01/2005	30.65	90x90	yes	
17.12.2013	GSM-2_2004336-2004366_0028_EIGEN_G---_005a	12/2004	26.70	90x90	yes	
17.12.2013	GSM-2_2004306-2004335_0029_EIGEN_GK2-_005a	11/2004	27.59	90x90	yes	1)
17.12.2013	GSM-2_2004275-2004305_0031_EIGEN_GK2-_005a	10/2004	30.23	90x90	yes	1)
17.12.2013	GSM-2_2004245-2004274_0030_EIGEN_GK2-_005a	09/2004	29.24	90x90	yes	1)
17.12.2013	GSM-2_2004214-2004244_0031_EIGEN_GK2-_005a	08/2004	30.13	90x90	yes	1)
17.12.2013	GSM-2_2004183-2004213_0031_EIGEN_GK2-_005a	07/2004	30.72	90x90	yes	1)
17.12.2013	GSM-2_2004153-2004182_0030_EIGEN_GK2-_005a	06/2004	29.24	90x90	yes	1)
17.12.2013	GSM-2_2004122-2004152_0031_EIGEN_G---_005a	05/2004	28.44	90x90	yes	
17.12.2013	GSM-2_2004092-2004121_0030_EIGEN_G---_005a	04/2004	28.77	90x90	yes	
17.12.2013	GSM-2_2004061-2004091_0031_EIGEN_G---_005a	03/2004	30.43	90x90	yes	
17.12.2013	GSM-2_2004035-2004060_0026_EIGEN_G---_005a	02/2004	25.63	90x90	yes	
17.12.2013	GSM-2_2003353-2004014_0027_EIGEN_G---_005a	01/2004	26.30	90x90	yes	5)
17.12.2013	GSM-2_2003335-2003365_0031_EIGEN_G---_005a	12/2003	30.27	90x90	yes	
17.12.2013	GSM-2_2003305-2003334_0030_EIGEN_G---_005a	11/2003	28.98	90x90	yes	
17.12.2013	GSM-2_2003274-2003304_0030_EIGEN_G---_005a	10/2003	29.10	90x90	yes	
17.12.2013	GSM-2_2003244-2003273_0030_EIGEN_G---_005a	09/2003	29.63	90x90	yes	
17.12.2013	GSM-2_2003213-2003243_0031_EIGEN_G---_005a	08/2003	29.72	90x90	yes	
17.12.2013	GSM-2_2003182-2003212_0031_EIGEN_G---_005a	07/2003	30.59	90x90	yes	
17.12.2013	GSM-2_2003121-2003141_0021_EIGEN_G---_005a	05/2003	19.83	90x90	yes	
17.12.2013	GSM-2_2003091-2003120_0030_EIGEN_G---_005a	04/2003	29.36	90x90	yes	
17.12.2013	GSM-2_2003060-2003090_0030_EIGEN_G---_005a	03/2003	27.26	90x90	yes	

17.12.2013	GSM-2_2003032-2003059_0028_EIGEN_G---_005a	02/2003	23.03	90x90	yes	
17.12.2013	GSM-2_2003001-2003031_0026_EIGEN_G---_005a	01/2003	17.57	90x90	yes	

Comments:

- 1) Due to sparse ground track coverage caused by short-interval repeat orbit patterns (e.g. 4d-repeat peaked in 09/2004, 3d-repeat peaked in 05/2012, 2d-repeat peaked in 02/2015), some solutions are stabilized by applying a modified version of the regularization method used for previous releases, which is based on Kaula's power law (Bettadpur, S (2004), GRACE Mission Status and Gravity Field Product Improvement Plans, *Eos Trans. AGU*, 85(47), Fall Meet. Suppl., Abstract G23A-01). The modification yields in less strong signal (and noise) suppression for medium and high degrees and therefore rather realistic (i.e. comparable to "normal" GRACE solutions) error estimates of the resulting gravity field coefficients. Thus, contrary to RL04, the calibrated errors of such stabilized RL05/RL05a solutions do not necessarily have to be ignored by the users. The stabilized solutions can be identified by the string "GK2-" instead of "G---" in the GSM-product name.
- 2) Due to switched-off accelerometers on GRACE-A and -B, the available data for processing the November 2011 solution is limited to the period 2011/11/01 – 2011/11/15. To allow for the generation of a solution of acceptable quality, data from the period 2011/10/16 – 2011/10/31 has been added.
- 3) Due to switched-off accelerometers on GRACE-A and -B, the available data for processing the November 2011 solution is limited to the period 2011/12/13 – 2011/12/31. To allow for the generation of a solution of acceptable quality, data from the period 2012/01/01 – 2012/01/11 has been added.
- 4) Due to switched-off accelerometers on GRACE-A and -B, the available data for processing the April 2012 solution is limited to the period 2012/04/01 – 2012/04/18. To allow for the generation of a solution of acceptable quality, data from the period 2012/03/20 – 2012/03/31 has been added.
- 5) Due to missing L1B data caused by satellite operations, the available data for processing the January 2004 solution is limited to the period 2004/01/01 – 2004/01/14. To allow for the generation of a solution of acceptable quality, data from the period 2003/12/19 – 2003/12/31 has been added.
- 6) Due to sparse ground track coverage caused by a 2d-repeat peaked in 02/2015, an alternative solution estimated up to a maximum degree of 90 and a maximum order of 30 has been generated. This alternative solution is provided for experimental use and can be identified by the string "GOL-" instead of "G---" in the GSM-product name.
- 7) Due to switched-off KBR instrument and accelerometers on GRACE-A and -B, the available data for processing the May 2015 solution is limited to the period 2015/05/01 – 2015/05/11. To allow for the generation of a solution of acceptable quality, data from the period 2015/04/12 – 2015/04/30 has been added.

- 8) Due to switched-off KBR instrument on GRACE-B, there is no KBR data available during the period 2015/07/07 – 2015/07/12. To allow for the generation of a July 2015 solution of acceptable quality, data from the period 2015/06/29 – 2015/06/30 has been added.
- 9) In view of the currently applied battery management on GRACE and the fact that periods with switched-off KBR instrument and accelerometers become longer, the GRACE SDS has agreed on the following data spans:
- December 2015 solution: 2015/12/11 – 2016/01/03
 - January 2016 solution: 2016/01/04 – 2016/01/28
 - February 2016 solution: 2016/01/29 – 2016/02/29
 - November 2016 solution: 2016/11/13 – 2016/12/10
 - December 2016 solution: 2016/12/11 – 2017/01/06
 - January 2017 solution: 2017/01/07 – 2017/02/03
 - March 2017 solution: 2017/03/17 – 2017/04/14
 - April 2017 solution: 2017/04/10 – 2017/05/08
 - May 2017 solution: 2017/05/02 – 2017/05/22
 - June 2017 solution: 2017/05/23 – 2017/06/29
- 10) Due to switched-off KBR instrument on GRACE-B, there is no KBR data available during the period 2016/07/30 – 2016/08/07. As both KBR instrument and accelerometers have been switched off on 2016/09/03 preventing the generation of a September 2016 solution, data from the period 2016/09/01 – 2016/09/03 has been added to the August 2016 solution.
- 11) As the accelerometer on GRACE-B is turned off, transplanted accelerometer data from GRACE-A is used for GRACE-B. Corresponding transplant ACC1B products are provided by JPL. In addition, the KBR instrument on GRACE-B collects data only in the sunlight and through partial shadow. Note that due to these circumstances, the quality of the solutions is significantly worse compared to solutions with nominal data availability.
- 12) On 2017/03/29 the $+1^\circ$ and -1° pitch angles were set to 0° on both spacecraft to improve the quality of the transplanted GRACE-B ACC1B product. However, this also lead to higher noise in the KBR1B data and significantly larger KBR residuals were observed since then. Note that also the quality of the Level-2 solutions might be additionally degraded due to this fact.