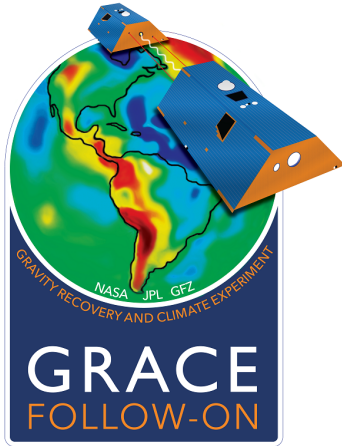




GRACE Follow-On

Science Data System Newsletter

Report: Apr-May 2019 (No. 3)

Contact: gracefo@jpl.nasa.gov

Frank Webb¹, Frank Flechtner², Felix Landerer¹, Michael Watkins¹,
Himanshu Save³, Christoph Dahle²

¹ Jet propulsion Laboratory / California Institute of Technology, Pasadena, CA

² GFZ German Research Centre for Geosciences, Potsdam, Germany

³ Center for Space Research, University of Texas, Austin, TX

GRACE Follow-On Science Data System & Highlights:

On May-24, 2019, the GRACE-FO project released their first Level-1 data products, which are now available at NASA's Physical Oceanography Distributed Active Archive Center ([PO.DAAC](#)) and GFZ's Information System and Data Center ([ISDC](#)). This first product release includes all Level-1 data necessary for the generation of Level-2 gravity field products. The data span the period from June 2018, initial power-up of the instruments during in orbit check out (IOC), through May 2019. Subsequent Level-1 products are now available at PO.DAAC and ISDC approximately every 7 days. Please refer to Level-1 release notes and documentation ([PO.DAAC](#) / [ISDC](#)) for a detailed description of the data, file formats, updates, and conventions.

On June-12, 2019, the GRACE-FO project released their first Level-2 data products, which are now available at NASA's Physical Oceanography Distributed Active Archive Center (PO.DAAC) and GFZ's Information System and Data Center (ISDC). This first product release includes nine monthly gravity fields from the three mission Science Data System centers (JPL, GFZ, CSR), as well as the corresponding atmosphere and ocean dealiasing (AOD) background model data, spanning the period from June-2018 through April-2019. Subsequent monthly Level-2 products will be available at PO.DAAC and ISDC on a monthly basis starting in July-2019. Please refer to Level-2 data set release notes and documentation (at PO.DAAC and ISDC) for a detailed description of the data, file formats, updates, conventions, as well as important processing recommendations.

The GRACE Follow-On Project team is looking forward to presentations and discussions of data quality, findings and analyses at the Science Team Meeting in Pasadena this fall (Oct 8-10, 2019). Invitations for attending the Science Team Meeting will be sent out in a few weeks. **Save the date!**



Calendar & Upcoming Events:

- IUGG 2019 (July 8-18, 2019, Montreal, Canada)
- 1st GRACE-FO LRI Level-1 data release (no later than July-28, 2019)
- GRACE / GRACE-FO Science Team Meeting (Oct 8-10, 2019, Pasadena, CA, U.S.A.)

GRACE Follow-On: Mission Status

GRACE Follow-On: Orbit

The GRACE Follow-On orbital parameters on 2019-06-21 (day 172) were as follows:

Sun Beta (deg)	66.5
Absolute Distance (km)	175.7
Drift (km/d)	0.05
Mean Altitude (>6378.1 km)	491.0
Decay Rate (GF1/GF2) (7d mean, m/d)	0.6 / 0.5

Science-relevant Mission Events & Plans:

- Operations in science ranging mode and collecting K/Ka-band ranging observations. Laser Ranging is enabled as well. The GF2 ACC is in Large-Range-Mode (LRM).
 - Note calibration periods & activities highlighted in Level-1 v04 notes below
- Monthly Center-of-Mass offset verification (regular activity).

Level-1, Level-2, Level-3 Data Processing

Level-1 Data Processing & Delivery

- Level-1 Release 04 instrument data have been processed at JPL and are archived at JPL [PO.DAAC](#) and GFZ [ISDC](#). Please refer to the statistics below.
- Please refer to the Level-1 Release Notes as well as to the Sequence-of-Events (SOE) logfile for important updates and comments ([PO.DAAC](#) / [ISDC](#)).

Date	Events
2018-05-29	GRACE-C IPU reset at 09:26:20.0000, then KBR tracking start at 09:29 GRACE-D IPU reset at 11:00:00.0000, then KBR tracking start at 11:03
2018-06-04	GRACE-C performed CoM calibration test - NOM-AH from 11:31 - 14:48 GRACE-D performed CoM calibration test - NOM-AH from 13:07 - 16:21
2018-06-06	GRACE-C performed CoM calibration - NOM-AH from 01:05 - 15:40 GRACE-D performed CoM calibration - NOM-AH from 01:07 - 15:40



2018-06-07 GRACE-D IPU reset at 14:34:40.0000 (spontaneous).

2018-06-15 GRACE-C IPU reset at 08:28:50.0000 (spontaneous)
GRACE-C IPU reset at 09:39:20.0000 (commanded)

2018-06-21 GRACE-C and GRACE-D ACC in LRM mode 00:01 to 24:00 (from GRACE-FO Operations Status Report)
GRACE-C performed short CoM calibration - NOM-AH 01:10 - 04:30
GRACE-D performed short CoM calibration - NOM-AH 01:00 - 04:20

2018-06-22 GRACE-C performed a collision avoidance maneuver from 19:57:34 to 19:58:23 (j2ksec) (0.7 cm/sec) using both thrusters (49s)

GRACE-D performed a make-up maneuver due to GRACE-C collision avoidance maneuver from 21:37:42 to 21:39:06 (j2ksec) (1.24 cm/ssec) using both thrusters (84s)

2018-07-01 GRACE-D IPU SEU (Single Event Upset) resulted in loss of nav data. Back to nominal within one rev. GPS data disappears at 00:06:40,

reappears at 00:09:30 but results in km-level POD range residuals, then back to normal at 01:38:40.
GRACE-D Missed Interrupt seen in KBR data starting at 00:07:15.0000

2018-07-02 GRACE-D IPU reset at 06:44:10.0000 (commanded)

2018-07-08 GRACE-D IPU reset at 00:06:00.0000 (spontaneous)
GRACE-D IPU reset at 00:13:46.0000 (commanded)

2018-07-16 GRACE-C IPU reset at 09:29:40.0000 (commanded)

2018-07-18 GRACE-D IPU reset at 18:08. It reset again then powered off at 21:11, resulting in loss of KBR/GNV/GPS/ILG/IHK science telemetry from that time onward.

GRACE-C performed mass trims - ACC commanded into LRM mode at 11:50

2018-07-19 GRACE-D IPU reset at 10:00, and powered off 10 mins later. Satellite commanded into safe mode (ASM) at 11:35.

2018-07-20 GRACE-C IPU reset at 08:05:40.0000, K/Ka tracking disabled

2018-07-24 GRACE-C performed mass trims - ACC commanded into LRM mode at 09:26

2018-07-26 GRACE-C IPU reset at 00:18:40.0000, K/Ka tracking disabled
GRACE-C IPU reset at 12:11:40.0000, K/Ka tracking disabled

2018-07-28 2018-07-29 GRACE-C performed CoM calibration - NOM-AH 2018-07-28 22:30 - 2018-07-29 10:00

2018-10-16 GRACE-D IPU reset at 08:07:10.0000, IPU on "A side" being powered on

2018-10-18 GRACE-D OBC time was synchronized with Receiver (onboard GPS) time at 10:32.

2018-10-22 GRACE-C performed an out-of-plane maneuver in between 90-degree slewing after 04:46:00 and back before 05:17:00;

(10.6 cm/sec) using both orbit control thrusters (735s)
GRACE-C IPU soft restart at 08:01:30.0000 to enable KBR tracking
GRACE-D IPU soft restart at 09:04:50.0000 to enable KBR tracking

2018-10-30 GRACE-C performed a CoM calibration from 2018-10-30 15:57 to 2018-10-31 03:30



GRACE-D performed a CoM calibration from 2018-10-30 20:26 to 2018-10-31 05:50

2018-10-31 GRACE-C continued CoM calibration until 03:30
GRACE-D continued CoM calibration until 05:50

2018-11-06 GRACE-D IPU reset at 04:20:20.0000

2018-11-08 GRACE-C performed a CoM calibration from 01:20 to 16:21
GRACE-D performed a CoM calibration from 01:20 to 16:21

2018-11-09 GRACE-C IPU soft restart at 09:00:30.0000

2018-11-12 GRACE-D IPU soft restart at 12:36:30.0000

2018-11-15 New NOM-FP AOCs parameter settings uploaded to both satellites (after 09:48 for GF1, and at 10:25 for GF2),

2018-12-07 GRACE-C IPU restart around 16:13:25
GRACE-D IPU restart around 16:13:55

2018-12-11 GRACE-C performed a CoM calibration from 00:21 to 13:40
GRACE-D performed a CoM calibration from 00:22 to 13:41
GRACE-C IPU soft restart at 17:54:30.0000
GRACE-D IPU soft restart at 17:54:30.0000

2018-12-14 GRACE-D IPU soft restart at 18:21:30.0000
GRACE-C IPU soft restart at 18:21:40.0000

2018-12-28 GRACE-D IPU soft restart at 07:28:30.0000
GRACE-C IPU soft restart at 07:28:40.0000

2019-01-12 GRACE-C IPU soft restart at 09:27:40.0000
GRACE-D IPU soft restart at 09:28:10.0000

2019-01-16 GRACE-C performed a CoM calibration from 14:30 to 23:45
GRACE-D performed a CoM calibration from 10:11 to 21:16

2019-01-17 GRACE-C performed a CoM calibration from 09:10 to 09:13

2019-01-26 GRACE-C IPU restart around 11:07:00

2019-02-01 GRACE-C IPU reset at 12:12:50.0000

2019-02-04 GRACE-D IPU soft restart at 16:00:30.0000

2019-02-06 GRACE-C and D accelerometer thruster pulse plateau characterization - manual commanding of the attitude control thrusters (ACT) was performed.

GRACE-C: The thrust manual commanding sequence was performed from 16:39 through 16:42 at a realtime contact (NSG).

GRACE-D: The thrust manual commanding sequence was performed from 15:04 through 15:07 at a realtime contact (NSG).

2019-02-07 GRACE-D at 08:27 OBC-A rebooted after a communication problem.
GRACE-D turned off (2018-02-07 status report)

2019-02-19 GRACE-D IPU brought up again at 13:19:40

2019-02-21 GRACE-D IPU soft restart at 13:05:30 to re-enable KBR tracking



GRACE-C IPU soft restart at 13:05:40 to re-enable KBR tracking

2019-02-26 GRACE-C performed CoM calibration - NOM-AH 05:35 - 18:40

2019-02-28 GRACE-D At 11:49 the accelerometer (ACC) was powered on into Large Range Mode (LRM)

2019-03-04 GRACE-C IPU spontaneous reboot at 18:48:30, probably caused by SEU

2019-03-06 GRACE-C IPU soft restart at 13:25:40

2019-03-19 GRACE-D orbit maintenance maneuver at 13:30:22.6000 lasting about 17 seconds

2019-03-22 GRACE-D IPU soft restart at 17:11:30
GRACE-C IPU soft restart at 17:11:40

2019-03-26 GRACE-C performed CoM calibration - NOM-AH 2019-03-26 15:46 - 2019-03-27 03:40
GRACE-D performed CoM calibration - NOM-AH 2019-03-26 12:45 - 2019-03-27 04:20

2019-03-27 Thruster plateau test on both satellites beginning at ~13:30

2019-03-28 Ongoing thruster plateau test on both satellites finished at ~19:20

2019-03-30 GRACE-C spontaneous reboot of the LRI was experienced at ~21:39

2019-04-13 GRACE-D IPU spontaneous reboot at 03:33:20, probably caused by SEU

2019-04-24 GRACE-C performed CoM calibration from 12:53 to 23:42

2019-04-24 GRACE-D performed CoM calibration from 13:47 to 22:05

2019-04-25 GRACE-C performed CoM calibration from 01:29 to 01:32

2019-04-25 GRACE-D performed CoM calibration from 00:49 to 02:52

2019-04-25 GRACE-C IPU soft restart was commanded at 09:55:40.00

2019-04-25 GRACE-C and D LRI1A and LSM1A data ends at 03:31; LRI was commanded to Diagnostic Mode (04:00) on both satellites and started to collect high rate data around eclipse exit

2019-04-29 GRACE-C and D LRI commanded back to Re-Aquisition Mode at 06:00, returning to Science Mode (resuming LRI1A and LSM1A data) soon after

2019-05-02 The sampling rate of a housekeeping telemetry packet (SPID14001) was increased from once per 6 sec to 1 sec to support the data analysis
Grace-C SPID14001 sampling rate was increased at 09:46
Grace-D SPID14001 sampling rate was increased at 08:12

2019-05-03 GRACE-D IPU soft restart was commanded at 10:02:10.00

2019-05-08 GRACE-C data gap in GNV1A from 610620868 till 610620934 (66 sec) and from 610620954 till 610620992 (38 sec).

2019-05-10 GRACE-C IPU reboot at 14:36:40.00 in response to 355 second period without Nav Solution

2019-05-12 GRACE-C spontaneous IPU reboot at 20:18:50.00 was probably a SEU (caused by radiation)

2019-05-15 GRACE-C IPU reboot at 02:39:10.00

2019-05-24 CoM calibration on both spacecraft
GRACE-C: CMCAL start: 20190523 23:30, CMCAL end: 20190524 14:15
GRACE-D: CMCAL start: 20190524 00:10, CMCAL end: 20190524 17:45

2019-05-28 GRACE-C IPU soft restart was commanded at 20:00:40.00



2019-05-29 GRACE-D 20-second gap in GNV1A: 612378130 (2019-05-29 05:02:10) to 612378150 (2019-05-29 05:02:30) in GNV1A_2019-05-29_D_NYA_612371170.pass.

KBR Performance Statistics

- [see Appendix 1A (p. 8)]

Level-1 Data Product Availability

- [see Appendix 1B (p. 14) for GRACE-FO Level-1 data]
- [see Appendix 1C (p. 14) for de-aliasing AOD1B model data]

Level-2 Data Processing & Delivery

Level-2 Data availability

- Level-2 Release 06 data have been processed at JPL, GFZ and CSR and are archived at JPL [PO.DAAC](#) and GFZ [ISDC](#).
- Please refer to the Level-2 Release Notes as well as to the Sequence-of-Events (SOE) logfile for important updates and comments ([PO.DAAC](#) / [ISDC](#)).
- [see Appendix 2A (p. 14) for overview tables on data availability].

Level-2 Ancillary Products and Comments

- TN-11 containing C20 estimates derived from SLR and using Level-2 RL06 standards (Cheng and Ries, 2013) is frequently updated. It is recommended to replace the GRACE-FO C20 coefficient with this product.
- TN-13[a,b,c] containing geocenter estimates using the methods of Swenson et al. (2010) and Sun et al. (2016) is frequently updated. It is recommended to augment the GRACE / GRACE-FO geocenter with this product.
- TN-14 containing C30 estimates derived from SLR and using Level-2 RL06 standards (Loomis et al., 2019) is frequently updated. It is recommended to replace the GRACE-FO C30 coefficient with this product.

Level-2 Data Processing & Delivery

- Level-3 data products will be released in the coming weeks – stay tuned!

Resources and Links:

Data Archive Links:

- NASA PO.DAAC (<http://podaac.jpl.nasa.gov>)
- GFZ ISDC (<https://isdc.gfz-potsdam.de/grace-fo-isdc>)



Miscellaneous Links:

- For GRACE Follow-On mission updates and news, please visit <https://gracefo.jpl.nasa.gov> and <http://gfz-potsdam.de/en/grace-fo>.
- The proceedings of previous GRACE / GRACE-FO Science Team Meetings are available at <https://www.gfz-potsdam.de/en/grace/>.
- Searchable databases of **GRACE and GRACE-FO related publications** are available at
 - http://www-app2.gfz-potsdam.de/pb1/op/grace/references/sort_date.html
 - <https://grace.jpl.nasa.gov/publications/>
 - If you are missing a publication please send an e-mail to Frank Flechtner (flechtne@gfz-potsdam.de) or contact the JPL team via <https://grace.jpl.nasa.gov/about/feedback/>.

Appendix

1.A - KBR Performance Statistics

KBR QUALITY ASSESSMENT

Key to columns in the table below

- 1) KBR1B product name
- 2) Total arc length with data (hours)
- 3) Number of observations used in KBR-GPS range residual calculation
- 4) KBR-GPS range residual RMS (mm)
- 5) Minimum KBR-GPS range residual (mm)
- 6) Maximum KBR-GPS range residual (mm)
- 7) Number of continuous segments in the KBR product

KBR1B_2018-05-29_Y_04.dat	12.9	9298	1.19	-3	2.9	1
KBR1B_2018-05-30_Y_04.dat	24	17281	1.46	-4.5	3.7	1
KBR1B_2018-05-31_Y_04.dat	24	17281	1.27	-3.4	4.7	1
KBR1B_2018-06-01_Y_04.dat	24	17281	1.16	-3.4	4	1
KBR1B_2018-06-02_Y_04.dat	24	17281	1.65	-7.6	4.3	1
KBR1B_2018-06-03_Y_04.dat	24	17281	1.39	-4.5	4.6	1
KBR1B_2018-06-04_Y_04.dat	24	17281	1.34	-4.3	3.8	1
KBR1B_2018-06-05_Y_04.dat	24	17281	1.25	-3.7	4.3	1
KBR1B_2018-06-06_Y_04.dat	24	17281	1.33	-3.5	4.8	1
KBR1B_2018-06-07_Y_04.dat	24	17182	1.1	-3.1	3.2	2
KBR1B_2018-06-08_Y_04.dat	24	17281	1.35	-5.5	4.3	1
KBR1B_2018-06-09_Y_04.dat	24	17281	1.38	-3.6	5.3	1
KBR1B_2018-06-10_Y_04.dat	24	17281	1.36	-5.3	3.9	1
KBR1B_2018-06-11_Y_04.dat	24	17281	1.32	-5.6	5	1
KBR1B_2018-06-12_Y_04.dat	24	17281	1.61	-4.2	8.2	1
KBR1B_2018-06-13_Y_04.dat	24	17281	1.21	-3.6	4.1	1
KBR1B_2018-06-14_Y_04.dat	24	17281	1.21	-4.7	3.3	1
KBR1B_2018-06-15_Y_04.dat	24	17058	2.21	-5.2	20.6	3
KBR1B_2018-06-16_Y_04.dat	24	17281	1.25	-4.7	5.3	1
KBR1B_2018-06-17_Y_04.dat	24	17281	1.31	-3.9	4.3	1
KBR1B_2018-06-18_Y_04.dat	24	17281	1.48	-4.8	7	1
KBR1B_2018-06-19_Y_04.dat	24	17281	1.4	-5.5	5.2	1
KBR1B_2018-06-20_Y_04.dat	24	17281	1.13	-3.7	3.5	1
KBR1B_2018-06-21_Y_04.dat	24	17281	1.29	-4.8	3.7	1
KBR1B_2018-06-22_Y_04.dat	24	16666	1.43	-4.4	23.8	2
KBR1B_2018-06-23_Y_04.dat	24	17281	1.28	-4.5	3.1	1
KBR1B_2018-06-24_Y_04.dat	24	17281	1.37	-5.8	3.2	1
KBR1B_2018-06-25_Y_04.dat	24	17281	1.19	-3.6	3.8	1
KBR1B_2018-06-26_Y_04.dat	24	17281	1.2	-4.1	4.2	1
KBR1B_2018-06-27_Y_04.dat	24	17281	1.16	-2.9	4.6	1
KBR1B_2018-06-28_Y_04.dat	24	17281	1.26	-3.5	5	1
KBR1B_2018-06-29_Y_04.dat	24	17281	1.21	-4.2	4	1
KBR1B_2018-06-30_Y_04.dat	24	17281	1.3	-6.2	4.6	1
KBR1B_2018-07-01_Y_04.dat	24	16075	1.7	-4.4	20.2	1
KBR1B_2018-07-02_Y_04.dat	24	17204	1.5	-5.2	4.3	2



KBR1B_2018-07-03_Y_04.dat	24	17281	1.38	-5	4.9	1
KBR1B_2018-07-04_Y_04.dat	24	17281	1.4	-5.6	4.2	1
KBR1B_2018-07-05_Y_04.dat	24	17281	1.53	-5.3	5	1
KBR1B_2018-07-06_Y_04.dat	24	17281	1.22	-4.4	4	1
KBR1B_2018-07-07_Y_04.dat	24	17281	1.69	-7.5	10.7	1
KBR1B_2018-07-08_Y_04.dat	24	17107	1.5	-5.3	4.2	1
KBR1B_2018-07-09_Y_04.dat	24	17281	1.36	-4.3	4.7	1
KBR1B_2018-07-10_Y_04.dat	24	17281	1.34	-4.9	3.6	1
KBR1B_2018-07-11_Y_04.dat	24	17281	1.43	-4.2	4.9	1
KBR1B_2018-07-12_Y_04.dat	24	17281	1.69	-7.5	5.2	1
KBR1B_2018-07-13_Y_04.dat	24	17281	1.52	-5.6	4.4	1
KBR1B_2018-07-14_Y_04.dat	24	17281	1.73	-5.2	4.7	1
KBR1B_2018-07-15_Y_04.dat	24	17281	1.79	-6.5	5.9	1
KBR1B_2018-07-16_Y_04.dat	24	17217	1.74	-8.3	6.1	2
KBR1B_2018-07-17_Y_04.dat	24	17281	1.49	-5	4	1
KBR1B_2018-07-18_Y_04.dat	21.2	15171	1.67	-6.4	5.1	2
KBR1B_2018-10-22_Y_04.dat	14.8	10675	1.52	-4	5.3	1
KBR1B_2018-10-23_Y_04.dat	24	17281	1.42	-3.5	4.2	1
KBR1B_2018-10-24_Y_04.dat	24	17281	1.11	-4	4.8	1
KBR1B_2018-10-25_Y_04.dat	24	17281	1.21	-3.1	4.3	1
KBR1B_2018-10-26_Y_04.dat	24	17281	1.39	-4.7	5.9	1
KBR1B_2018-10-27_Y_04.dat	24	17281	1.28	-4.1	4.3	1
KBR1B_2018-10-28_Y_04.dat	24	17281	1.35	-6.2	3.5	1
KBR1B_2018-10-29_Y_04.dat	24	17281	1.51	-6.4	6	1
KBR1B_2018-10-30_Y_04.dat	24	17281	1.36	-5.6	6.1	1
KBR1B_2018-10-31_Y_04.dat	24	17281	1.39	-5.9	3.6	1
KBR1B_2018-11-01_Y_04.dat	24	17281	1.31	-5.1	5.8	1
KBR1B_2018-11-02_Y_04.dat	24	17281	1.19	-4.4	3.6	1
KBR1B_2018-11-03_Y_04.dat	24	17281	1.23	-2.9	4.7	1
KBR1B_2018-11-04_Y_04.dat	24	17281	1.25	-3.7	3.7	1
KBR1B_2018-11-05_Y_04.dat	24	17281	1.46	-4.6	4.5	1
KBR1B_2018-11-06_Y_04.dat	24	17211	1.64	-5.2	4.9	2
KBR1B_2018-11-07_Y_04.dat	24	17281	1.63	-5.3	4.6	1
KBR1B_2018-11-08_Y_04.dat	24	17281	1.93	-6.3	6.9	1
KBR1B_2018-11-09_Y_04.dat	24	17197	1.59	-4.5	4.3	2
KBR1B_2018-11-10_Y_04.dat	24	17281	1.86	-5.1	6	1
KBR1B_2018-11-11_Y_04.dat	24	17281	1.65	-5.2	5.7	1
KBR1B_2018-11-12_Y_04.dat	24	17210	1.4	-3.6	5.2	2
KBR1B_2018-11-13_Y_04.dat	24	17281	1.39	-4.3	4.7	1
KBR1B_2018-11-14_Y_04.dat	24	17281	1.39	-4.2	5.7	1
KBR1B_2018-11-15_Y_04.dat	24	17281	1.28	-4.3	4.2	1
KBR1B_2018-11-16_Y_04.dat	24	17281	1.45	-4.5	4	1
KBR1B_2018-11-17_Y_04.dat	24	17281	1.4	-5.3	4.8	1
KBR1B_2018-11-18_Y_04.dat	24	17281	1.58	-5.3	5	1
KBR1B_2018-11-19_Y_04.dat	24	17281	1.42	-6.7	4.2	1
KBR1B_2018-11-20_Y_04.dat	24	17281	1.21	-3.3	4.3	1
KBR1B_2018-11-21_Y_04.dat	24	17281	1.32	-3.9	3.2	1
KBR1B_2018-11-22_Y_04.dat	24	17281	1.15	-3.3	4.7	1
KBR1B_2018-11-23_Y_04.dat	24	17281	1.17	-3.1	3.8	1
KBR1B_2018-11-24_Y_04.dat	24	17281	1.33	-4	4.3	1
KBR1B_2018-11-25_Y_04.dat	24	17281	1.46	-4.8	4.8	1
KBR1B_2018-11-26_Y_04.dat	24	17281	1.32	-2.9	6.5	1
KBR1B_2018-11-27_Y_04.dat	24	17281	1.21	-3.4	4.6	1



KBR1B_2018-11-28_Y_04.dat	24	17281	1.25	-3.9	3.6	1
KBR1B_2018-11-29_Y_04.dat	24	17281	1.37	-4.2	3.9	1
KBR1B_2018-11-30_Y_04.dat	24	17281	1.5	-4.9	5.2	1
KBR1B_2018-12-01_Y_04.dat	24	17281	1.42	-4.5	4.7	1
KBR1B_2018-12-02_Y_04.dat	24	17281	1.37	-4.6	3.9	1
KBR1B_2018-12-03_Y_04.dat	24	17281	1.75	-6.1	10.7	1
KBR1B_2018-12-04_Y_04.dat	24	17281	1.35	-3.9	4.1	1
KBR1B_2018-12-05_Y_04.dat	24	17281	1.53	-4.2	7.4	1
KBR1B_2018-12-06_Y_04.dat	24	17281	1.54	-4	8	1
KBR1B_2018-12-07_Y_04.dat	24	17192	1.43	-5.5	4.5	2
KBR1B_2018-12-08_Y_04.dat	24	17281	1.6	-7	4.5	1
KBR1B_2018-12-09_Y_04.dat	24	17281	1.4	-3.7	4.6	1
KBR1B_2018-12-10_Y_04.dat	24	17281	1.27	-5.5	4.1	1
KBR1B_2018-12-11_Y_04.dat	24	17199	1.3	-5.8	3.9	2
KBR1B_2018-12-12_Y_04.dat	24	17281	1.36	-4.5	3.7	1
KBR1B_2018-12-13_Y_04.dat	24	17281	1.53	-5.8	5.3	1
KBR1B_2018-12-14_Y_04.dat	24	17200	1.52	-10.6	3.5	2
KBR1B_2018-12-15_Y_04.dat	24	17281	1.42	-4.2	4.7	1
KBR1B_2018-12-16_Y_04.dat	24	17281	1.47	-5.7	4.6	1
KBR1B_2018-12-17_Y_04.dat	24	17281	1.33	-4.4	5.5	1
KBR1B_2018-12-18_Y_04.dat	24	17281	1.4	-4.1	6.3	1
KBR1B_2018-12-19_Y_04.dat	24	17281	1.39	-5.3	5	1
KBR1B_2018-12-20_Y_04.dat	24	17281	1.32	-3.9	3.5	1
KBR1B_2018-12-21_Y_04.dat	24	17281	1.63	-4.3	6.2	1
KBR1B_2018-12-22_Y_04.dat	24	17281	1.95	-6.8	7.3	1
KBR1B_2018-12-23_Y_04.dat	24	17281	1.56	-5	4.8	1
KBR1B_2018-12-24_Y_04.dat	24	17281	1.68	-8.2	4.3	1
KBR1B_2018-12-25_Y_04.dat	24	17281	1.92	-5.3	10.1	1
KBR1B_2018-12-26_Y_04.dat	24	17281	2.25	-10.1	9.3	1
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KBR1B_2018-12-29_Y_04.dat	24	17281	1.39	-3.6	5.5	1
KBR1B_2018-12-30_Y_04.dat	24	17281	1.56	-5.9	6.1	1
KBR1B_2018-12-31_Y_04.dat	24	17281	1.74	-7.2	5.4	1
KBR1B_2019-01-01_Y_04.dat	24	17281	1.38	-4	4.7	1
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KBR1B_2019-01-03_Y_04.dat	24	17281	1.77	-8.3	5.5	1
KBR1B_2019-01-04_Y_04.dat	24	17281	1.75	-8.4	5.2	1
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KBR1B_2019-01-16_Y_04.dat	24	17281	1.4	-3.8	4	1
KBR1B_2019-01-17_Y_04.dat	24	17281	1.42	-4.9	4.2	1
KBR1B_2019-01-18_Y_04.dat	24	17281	1.54	-6	5.3	1
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KBR1B_2019-01-20_Y_04.dat	24	17281	1.52	-6.8	5.8	1
KBR1B_2019-01-21_Y_04.dat	24	17281	1.32	-4	4.3	1
KBR1B_2019-01-22_Y_04.dat	24	17281	1.34	-3.6	3.6	1
KBR1B_2019-01-23_Y_04.dat	24	17281	1.49	-5.4	4.6	1
KBR1B_2019-01-24_Y_04.dat	24	17281	1.34	-3.8	5.8	1
KBR1B_2019-01-25_Y_04.dat	24	17281	1.47	-5.7	5.4	1
KBR1B_2019-01-26_Y_04.dat	24	17170	1.55	-6.2	6	2
KBR1B_2019-01-27_Y_04.dat	24	17281	1.71	-9.1	6.7	1
KBR1B_2019-01-28_Y_04.dat	24	17281	1.28	-3.9	3.3	1
KBR1B_2019-01-29_Y_04.dat	24	17281	1.31	-4.1	4.5	1
KBR1B_2019-01-30_Y_04.dat	24	17281	1.34	-4	4.7	1
KBR1B_2019-01-31_Y_04.dat	24	17281	1.51	-4	5.1	1
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KBR1B_2019-02-25_Y_04.dat	24	17281	1.31	-3.3	4.7	1
KBR1B_2019-02-26_Y_04.dat	24	17281	1.41	-4.6	4.3	1
KBR1B_2019-02-27_Y_04.dat	24	17281	1.37	-5.2	4.4	1
KBR1B_2019-02-28_Y_04.dat	24	17281	1.63	-6.8	6.3	1
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KBR1B_2019-03-02_Y_04.dat	24	17281	1.3	-6.3	4.2	1
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KBR1B_2019-03-08_Y_04.dat	24	17281	1.44	-4.1	4.8	1
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KBR1B_2019-03-11_Y_04.dat	24	17281	1.65	-4.5	8.9	1
KBR1B_2019-03-12_Y_04.dat	24	17281	1.52	-4.5	5.3	1
KBR1B_2019-03-13_Y_04.dat	24	17281	1.58	-6.6	5.3	1
KBR1B_2019-03-14_Y_04.dat	24	17281	1.36	-3.7	4.1	1
KBR1B_2019-03-15_Y_04.dat	24	17281	1.29	-4.8	3.6	1
KBR1B_2019-03-16_Y_04.dat	24	17281	1.49	-5	4.4	1
KBR1B_2019-03-17_Y_04.dat	24	17281	1.6	-7.9	5.5	1
KBR1B_2019-03-18_Y_04.dat	24	17281	1.43	-7	5.4	1
KBR1B_2019-03-19_Y_04.dat	24	17281	1.55	-6.7	3.4	1
KBR1B_2019-03-20_Y_04.dat	24	17281	1.43	-3.2	6.9	1
KBR1B_2019-03-21_Y_04.dat	24	17281	1.38	-7.1	4.6	1
KBR1B_2019-03-22_Y_04.dat	24	17199	1.48	-4.7	5.6	2
KBR1B_2019-03-23_Y_04.dat	24	17281	1.46	-7.4	3.7	1
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KBR1B_2019-03-25_Y_04.dat	24	17281	1.33	-3.7	5.8	1
KBR1B_2019-03-26_Y_04.dat	24	17281	1.47	-4.7	3.7	1



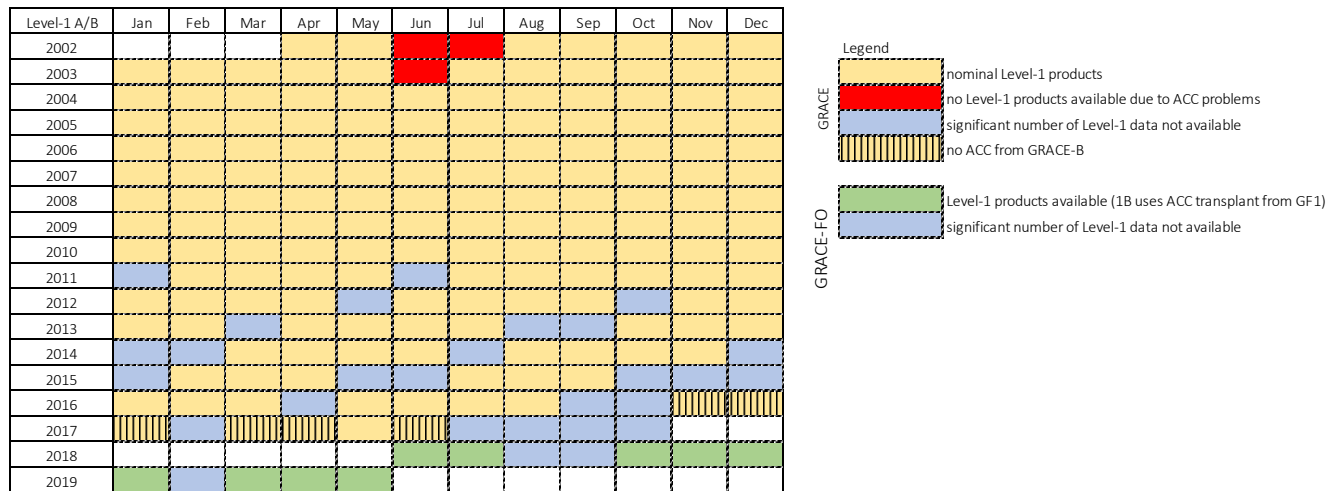
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KBR1B_2019-03-30_Y_04.dat	24	17281	1.41	-4.8	4.4	1
KBR1B_2019-03-31_Y_04.dat	24	17281	1.47	-5.4	5.5	1
KBR1B_2019-04-01_Y_04.dat	24	17281	1.55	-7.3	5.3	1
KBR1B_2019-04-02_Y_04.dat	24	17281	1.24	-3.8	3.3	1
KBR1B_2019-04-03_Y_04.dat	24	17281	1.38	-4.2	4.2	1
KBR1B_2019-04-04_Y_04.dat	24	17281	1.52	-6	4.4	1
KBR1B_2019-04-05_Y_04.dat	24	17281	1.26	-4.5	3.4	1
KBR1B_2019-04-06_Y_04.dat	24	17281	1.37	-4.7	4.6	1
KBR1B_2019-04-07_Y_04.dat	24	17281	1.4	-3.7	4.4	1
KBR1B_2019-04-08_Y_04.dat	24	17281	1.5	-3.6	7.3	1
KBR1B_2019-04-09_Y_04.dat	24	17281	1.44	-5.8	4.2	1
KBR1B_2019-04-10_Y_04.dat	24	17281	1.56	-3.6	5	1
KBR1B_2019-04-11_Y_04.dat	24	17281	1.72	-4.1	8.6	1
KBR1B_2019-04-12_Y_04.dat	24	17281	1.74	-7.6	7.8	1
KBR1B_2019-04-13_Y_04.dat	24	17174	1.45	-3.8	6.5	2
KBR1B_2019-04-14_Y_04.dat	24	17281	1.44	-3.8	4.8	1
KBR1B_2019-04-15_Y_04.dat	24	17281	1.77	-5.1	6	1
KBR1B_2019-04-16_Y_04.dat	24	17281	1.76	-4.8	7.1	1
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KBR1B_2019-04-21_Y_04.dat	24	17281	2.26	-6	8.4	1
KBR1B_2019-04-22_Y_04.dat	24	17281	2.36	-9.7	10.9	1
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KBR1B_2019-04-30_Y_04.dat	24	17281	1.44	-3.1	5.5	1
KBR1B_2019-05-01_Y_04.dat	24	17281	1.53	-6.3	4.4	1
KBR1B_2019-05-02_Y_04.dat	24	17281	1.47	-5	3.6	1
KBR1B_2019-05-03_Y_04.dat	24	17203	1.36	-3.5	4.9	2
KBR1B_2019-05-04_Y_04.dat	24	17281	1.58	-5.5	3.5	1
KBR1B_2019-05-05_Y_04.dat	24	17281	1.41	-5.9	3.7	1
KBR1B_2019-05-06_Y_04.dat	24	17281	1.62	-6.5	4.6	1
KBR1B_2019-05-07_Y_04.dat	24	17281	4.04	-8	35.3	1
KBR1B_2019-05-08_Y_04.dat	24	17281	1.67	-4.6	6.8	1
KBR1B_2019-05-09_Y_04.dat	24	17281	1.5	-4.8	5.6	1
KBR1B_2019-05-10_Y_04.dat	24	17215	1.59	-7	5	2
KBR1B_2019-05-11_Y_04.dat	24	17281	1.52	-6.5	5.5	1
KBR1B_2019-05-12_Y_04.dat	24	17195	1.53	-8.3	4.4	2
KBR1B_2019-05-13_Y_04.dat	24	17281	1.53	-5.1	4.7	1
KBR1B_2019-05-14_Y_04.dat	24	17281	1.31	-5.5	4.1	1
KBR1B_2019-05-15_Y_04.dat	24	17181	1.72	-4	11.6	2
KBR1B_2019-05-16_Y_04.dat	24	17281	1.38	-4.3	3.7	1
KBR1B_2019-05-17_Y_04.dat	24	17281	1.42	-4.4	4.8	1
KBR1B_2019-05-18_Y_04.dat	24	17281	1.52	-4.9	3.9	1



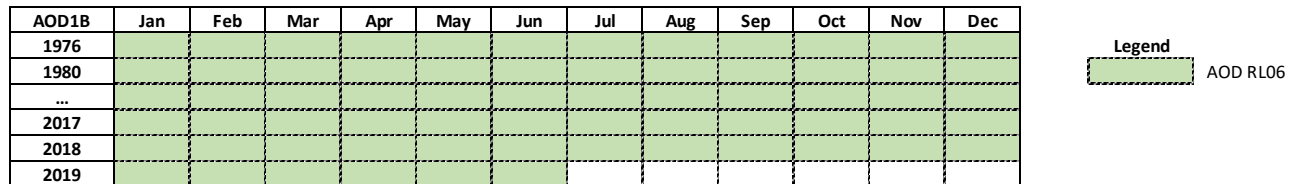
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KBR1B_2019-05-21_Y_04.dat	24	17281	1.21	-3.5	3.9	1
KBR1B_2019-05-22_Y_04.dat	24	17281	1.44	-4.4	3.7	1
KBR1B_2019-05-23_Y_04.dat	24	17281	1.43	-3.4	5.8	1
KBR1B_2019-05-24_Y_04.dat	24	17281	1.25	-4.1	3.8	1
KBR1B_2019-05-25_Y_04.dat	24	17281	1.24	-4.2	3.2	1
KBR1B_2019-05-26_Y_04.dat	24	17281	1.25	-4.2	4.6	1
KBR1B_2019-05-27_Y_04.dat	24	17281	1.67	-4.1	4.5	1
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KBR1B_2019-05-30_Y_04.dat	24	17281	1.37	-5.2	5.9	1
KBR1B_2019-05-31_Y_04.dat	24	17281	1.54	-5.1	4.9	1



1.B – Level-1 GRACE-FO Data Availability



1.C – Level-1 De-aliasing Model AOD1B Data Availability



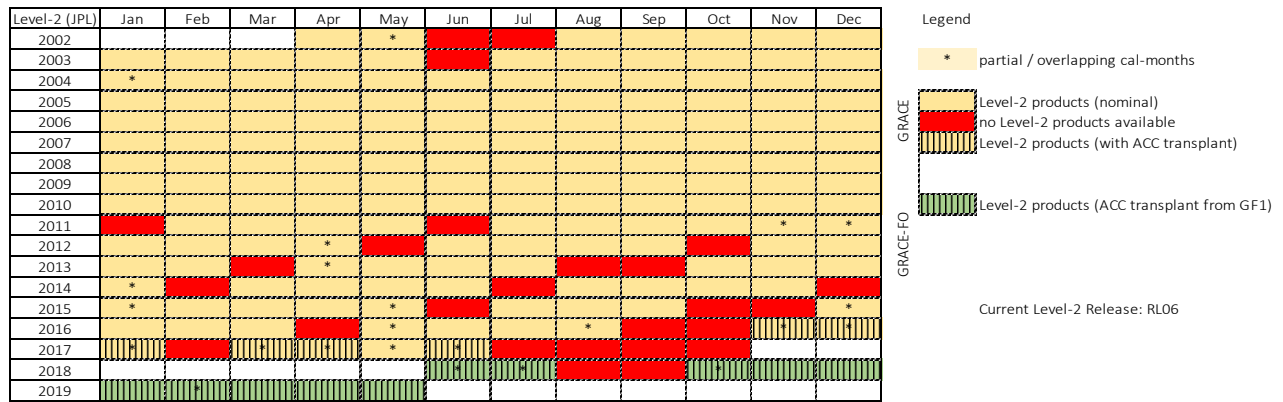
- For more information on the AOD de-aliasing AOD1B model please visit <https://www.gfz-potsdam.de/en/aod1b/>.

2.A – Level-2 Product and Data Availability

JPL, GFZ & CSR

- Current release: RL06
- All centers provide GSM solutions
 - Please check the Level-2 Release Notes for further details
- JPL and GFZ provide monthly de-aliasing models GAA, GAB, GAC, GAD; CSR provides GAC and GAD

GRAVITY RECOVERY AND CLIMATE EXPERIMENT *Follow-On*



Tab: GRACE and GRACE-FO Level-2 product availability.