This file contains GRACE-FO SPACECRAFT_EVENTS, manually written by Level-1 Science Data System

operators at NASA JPL, and updated with each weekly incremental data release. The contents of

this file augment the machine-readable Sequence of Events file [TN-01_SOE.txt].

#

Formatting:

- Each day entry starts with date in YYYY-MM-DD format.

- Multiple entries per date (typically) start with a new line.

#

2018-05-23 GRACE-C/D Missing data in the beginning of the arc, pass files show this as well. Changed start time

to the nearest 5-min epoch from the largest first time on the quaternions and initLeo (nav sol).

looks good, except possibly higher than normal number of outliers. This is early data, we should

look closer later.

IPU resets manually added at 04:21:00.0 for GRACE-C and 04:56:10.0 for GRACE-D

Time gaps of up to 27 seconds in IMU, MAG, TIM, and TNK near time syncs to GPS: GRACE-C at 08:09, GRACE-D at 09:52

2018-05-24 GRACE-C performed a calibration maneuver from 06:19:26 to 06:21:33 (2.0 cm/sec) using both OCT thrusters

GRACE-D performed a calibration maneuver from 10:55:57 to 10:58:03 (2.0 cm/sec) using both OCT thrusters

2018-05-25 GRACE-C performed a drift stop maneuver from 23:22:42 to 23:29:39 (6.0 cm/sec) using both OCT thrusters

2018-05-26 GRACE-D performed a drift stop maneuver from 00:57:48 to 01:04:34 (6.0 cm/sec) using both OCT thrusters #this is 10 min later than in OMM report email!

GRACE-C performed a drift stop maneuver from 02:02:40 to 02:09:43 (6.1 cm/sec) using both OCT thrusters

GRACE-D performed a drift stop maneuver from 04:14:37 to 04:21:30 (6.1 cm/sec) using both OCT thrusters #going by the OMM report email

2018-05-28 GRACE-C science data loss from 05-28 17:44 to 05-29 00:44

GRACE-D science data loss from 05-28 19:00 to 05-29 02:14

GRACE-D housekeeping data loss from 05-28 19:29 to 05-29 02:14

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

- Roll maneuver at 11:44

- Pitch maneuver at 13:19

- Yaw maneuver at 14:40 - cmccullo

GRACE-D performed CoM calibration test - NOM-AH from 13:07 - 16:21

- Roll maneuver at 13:20

- Pitch maneuver at 14:54

- Yaw maneuver at 16:15 - cmccullo

2018-06-06 GRACE-C performed CoM calibration - NOM-AH from 01:05 - 15:40

- Pitch maneuvers at 01:20, 11:02, 12:36

- Roll maneuvers at 07:52, 09:27

- Yaw maneuvers at 13:57, 15:31 - cmccullo

GRACE-D performed CoM calibration - NOM-AH from 01:07 - 15:40

- Pitch maneuvers at 01:21, 11:02, 12:37

- Roll maneuvers at 07:53, 09:28

- Yaw maneuvers at 13:57, 15:32 - cmccullo

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

While making ACC1A, AHK1A, and SCA1A, need to discard out-of-order time-tags at 581653898 at IPU reset. TIM1B values not available at this time.

Also, there are approximately 1 to 1.5-second gaps in ACC1A, AHK1A, and SCA1A for D at around 581653909

2018-06-08 GRACE-C/D Unexplained 1-2 minute gap in HRT, IMU, MAG, TIM, and TNK in the neighborhood of 581726084 to 581726209 for C, and 581720455 to 581720506 for D - hywen

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

GRACE-C IPU reset at 09:39:20.0000 (commanded)

2018-06-17 GRACE-C Possible micrometeoroid impact at 06:56:24 (delta-v of approximately 0.050 microns/sec). - cmccullo

2018-06-20 GRACE-D Up to and including this date, ACT1A D should be processed using the same script/strategy as for ACT1A C

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

- Yaw maneuver at 01:23

- Roll maneuver at 02:42

- Pitch maneuver at 04:18 - cmccullo

GRACE-D performed short CoM calibration - NOM-AH 01:00 - 04:20

- Roll maneuver at 01:11

- Yaw maneuver at 02:59

- Pitch maneuver at 04:10 - cmccullo

GRACE-C Possible micrometeoroid impact at 22:42:04 (delta-v of approximately 0.022 microns/sec). - cmccullo

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)

GRACE-C ACC to be commanded to LRM mode 19:00 - 21:00 (from GRACE-FO Operations Status Report)

GRACE-D ACC to be commanded to LRM mode 21:30 - 22:00 (from GRACE-FO Operations Status Report)

2018-06-30 GRACE-D See 2018-07-01 do a dataRecordDump and delete all data from 00:06:40 to 01:38:40

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?)

2018-07-12 GRACE-D The L1P and L2P phase don't agree at all when L1P is being tracked with channel 7, starting at 23:00:30 GPS time on 2018-07-12 until 2018-07-18. ch7 data edited out for orbit processing. -byun

2018-07-13 GRACE-D The L1P and L2P phase don't agree at all when L1P is being tracked with channel 7. ch7 data edited out for orbit processing -byun

2018-07-14 GRACE-D The L1P and L2P phase don't agree at all when L1P is being tracked with channel 7. ch7 data edited out for orbit processing -byun

2018-07-15 GRACE-D The L1P and L2P phase don't agree at all when L1P is being tracked with channel 7. ch7 data edited out for orbit processing -byun

2018-07-16 GRACE-D The L1P and L2P phase don't agree at all when L1P is being tracked with channel 7. ch7 data edited out for orbit processing -byun

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

2018-07-17 GRACE-D, the L1P and L2P phase don't agree at all when L1P is being tracked with channel 7. ch7 data edited out for orbit processing -byun

2018-07-18 GRACE-D, the L1P and L2P phase don't agree at all when L1P is being tracked with channel 7. ch7 data edited out for orbit processing -byun

GRACE-D IPU reset at 18:08:20. 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

- MTE-A switched on at 11:53

- At 11:55 trim mass moved in +Y direction 2487 steps (6.2 mm) for a change in CoM of +51.5 microns

- ACC commanded into NRM mode at 12:01

- At 12:06 trim mass moved in +Y direction by 2488 steps (6.2 mm) for a change in CoM of +51.5 microns

- MTE-A switch off at 12:09 - cmccullo

2018-07-19 GRACE-D IPU reset at 10:00, and powered off 10 mins later. Only a few mins of science data were dumped to ground within this short interval,

and OCC measurements were turned off. Satellite commanded into attitude 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

- MTE-A switched on at 09:27

- Trim mass moved in -Z direction by 725 steps (-1.8 mm) for a change in CoM of -15.0 microns (09:31)

- ACC commanded into NRM mode at 09:36

- Trim mass moved in -Z direction by 724 steps (-1.8 mm) for a change in CoM of -15.0 microns

- MTE-A switched off at 09:44 - cmccullo

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 Until 2018-07-29 GRACE-C performed CoM calibration

- NOM-AH 2018-07-28 22:30 - 2018-07-29 10:00

- Yaw maneuver at 22:51, 00:25

- Roll maneuver at 03:10, 04:45

- Pitch maneuver at 06:19, 07:54, 09:53 - cmccullo

2018-08-10 GRACE-C Data gap in GNV, GPS, ILG. From status report: "At 07:44 the IPU nav solution became invalid for almost 4 minutes

as the number of tracked GPS satellites dropped below 4 - since then nominal again." (hywen)

2018-09-03 GRACE-C IPU reset at 23:11:00.0000, K/Ka tracking disabled

2018-09-04 GRACE-C IPU reset at 07:23:40.0000, K/Ka tracking disabled

2018-09-24 GRACE-C IPU reset at 10:30:50.0000, K/Ka tracking disabled

2018-09-26 GRACE-C IPU reset at 07:59:55.0000, K/Ka tracking disabled

GRACE-C IPU reset at 15:07:26.0000, K/Ka tracking disabled

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

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

Backward time-jump can be seen in ACC1A, AHK1A, and SCA1A pass files; these out-of-order time-tags had to be discarded ("combine.p -x")

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 - cmccullo

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

2018-10-31 GRACE-C continued CoM calibration until 03:30 - cmccullo

GRACE-D continued CoM calibration until 05:50 - cmccullo

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 - cmccullo

GRACE-D performed a CoM calibration from 01:20 to 16:21 - cmccullo

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),

which will reduce the number of thruster firings, esp. in roll direction, and result in slightly higher propellant usage - hywen

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

GRACE-D IPU restart around 16:13:55 - cmccullo

2018-12-11 GRACE-C performed a CoM calibration from 00:21 to 13:40

- No sun or moon blindings during the calibration
- 00:21 - 00:24 Yaw maneuver at longitude 127, latitude between 8.3 and 19.7 in sun
- 02:21 - 02:24 Roll maneuver at longitude -86, latitude between 75.1 and 63.7 in eclipse
- 03:55 - 03:58 Roll maneuver at longitude -110, latitude between 77.3 and 65.9 in eclipse
- 05:30 - 05:33 Pitch maneuver at longitude -134, latitude between 75.6 and 64.3 in eclipse
- 07:04 - 07:07 Pitch maneuver at longitude -157, latitude between 77.8 and 66.4 in eclipse
- 11:23 - 11:26 Pitch maneuver at longitude -39, latitude between 8.4 and 19.8 in sun
- 13:37 - 13:40 Yaw maneuver at longitude 107, latitude between 21.7 and 10.2 in eclipse - cmccullo

GRACE-D performed a CoM calibration from 00:22 to 13:41

- Sun interference in SCA#2 for Yaw calibration around 00:22
- Sun interference in SCA#2 for Pitch calibration around 11:24
- No other sun or moon blindings

- 00:22 - 00:25 Yaw maneuver at longitude 127, latitude between 10.5 and 21.9 in sun

- 02:21 - 02:24 Roll maneuver at longitude -86, latitude between 76.7 and 65.4 in eclipse

- 03:55 - 03:58 Roll maneuver at longitude -110, latitude between 78.9 and 63.8 in eclipse

- 05:30 - 05:33 Pitch maneuver at longitude -134, latitude between 77.3 and 65.9 in eclipse

- 07:04 - 07:07 Pitch maneuver at longitude -158, latitude between 79.4 and 68.1 in eclipse

- 11:24 - 11:27 Pitch maneuver at longitude -39, latitude between 10.5 and 22.0 in sun

- 13:38 - 13:41 Yaw maneuver at longitude 106, latitude between 19.5 and 8.0 in eclipse - cmccullo

GRACE-C IPU soft restart at 17:54:30.0000 - efahnest

GRACE-D IPU soft restart at 17:54:30.0000 - efahnest

2018-12-13 IMU1A has a portion of data with time tag jump.

Tamara identified the problem area and I manually edited that out since it was small number of data - byun

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

GRACE-C IPU soft restart at 18:21:40.0000 - efahnest

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

GRACE-C IPU soft restart at 07:28:40.0000 - efahnest

2019-01-12 GRACE-C IPU soft restart at 09:27:40.0000 - efahnest

GRACE-D IPU soft restart at 09:28:10.0000 - efahnest

Grace-C CLK1A chi-square fit edited out data around 2019-01-11T21:00:00.

That lead into missing quaternion data and gd2e.py failed.

By adjusting the starting time of gd2e a few minutes late, the process can run. - byun

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

- 14:10:00 Disable lri commanding (reference direction and time offset)

- 14:30:00 - 14:33:00 roll maneuver at longitude = -123, latitude between 65.9 and 77.3 in sun

- 16:04:00 - 16:07:00 roll maneuver at longitude = -147, latitude between 63.7 and 75.1 in sun

- 17:39:00 - 17:42:00 pitch maneuver at longitude = -171, latitude between 65.3 and 76.8Â° in sun

- 19:13:00 - 19:16:00 pitch maneuver at longitude = -165, latitude between 63.2 and 74.6Â° in sun

- 22:08:30 - 22:11:30 yaw maneuver at longitude = 119, latitude between 9.1 and 24.4Â° in sun

- 23:42:30 - 23:45:30 yaw maneuver at longitude = 95, latitude between 6.9 and 22.3Â° in sun - tamarab

GRACE-D performed a CoM calibration from 10:11 to 21:16

- 09:55:00 Disable lri commanding (reference direction and time offset)

- 10:02:00 disable use of STR2 in DPG88 and 91

- 10:11:30 - 101430 yaw maneuver at longitude = 118, latitude between 21.5 and 6.1 in sun

- 11:46:00 - 114900 yaw maneuver at longitude = 94, latitude between 19.8 and 8.3 in sun

- 14:40:00 - 144300 roll maneuver at longitude = 48, latitude between 77.6 and 66.2 in sun

- 16:15:00 - 161800 roll maneuver at longitude = 24, latitude between 76.0 and 64.5 in sun

- 17:49:00 - 175200 pitch maneuver at longitude = 0, latitude between 78.1 and 66.7 in sun

- 19:24:00 - 192700 pitch maneuver at longitude = -23, latitude between 76.4 and 65.0 in sun

- 21:13:30 - 211630 pitch maneuver at longitude = -48, latitude between 21.3 and 6.0 in sun

- 21:19:00 enable use of STR2 in DPG88 and 91

- 21:30:00 enable lri commanding (reference direction and time offset) - tamarab

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

- 09:10:00 - 09:13:00 pitch maneuver at longitude = -47, latitude between 9.3 and 20.8 in sun

- 09:30:00 enable lri commanding (reference direction and time offset) - tamarab

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

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

2019-02-02 Starting around 20:00 the number of GPS satellite tracking got low for Grace-D - byun

2019-02-03 Due to low satellite tracking from Grace-D, I had to force the orbit processing. -byun

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

2019-02-06 GRACE-C and D accelerometer thruster pulse plateau characterization - manual commanding of the attitude control

thrusters (ACT) was performed. First an alternating sequence of 24 1s long actuations of +pitch/-pitch ACTs.

Then an alternating sequence of 24 1s long actuations of -yaw/+yaw ACTs. During the thruster firing LRI was commanded to standby mode and was collecting high rate data.

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.

As this reboot did not cure the problem the switch-over to OBC-B was triggered at 08:32.

This caused all instruments and the star camera equipment powered off, and S/C was in Attitude Hold Mode with nadir pointing.

This also caused cold gas branch A (CGPS-A) and transmitter A (TX-A) turned off, and

mass memory MMU-B was in use and the mission timeline (MTL) was disabled, which stopped the downlinks over Ny-Alesund.

At 14:42 the MTL was re-enabled and re-loaded and CGPS-A was enabled again.

At the end of the contact TX-B was switched off - so that TX-A will be used again for all upcoming downlinks.

Some manual re-dumps of the inactive MMU-A were commanded successfully, and the s/c is in a safe state. - byun

GRACE-D turned off (2018-02-07 status report) - hywen

2019-02-08 Initially IMU pass data had a large gap near 12pm.

This gap was filled in when SCI data were manually dumped from inactive MMU-A around 14:20.

However, the pass table ellipse plot still shows the gap because that particular pass entry in report file has start time bigger than stop time.

The javascript edits out that kind of abnormal lines.

2019-02-12 GRACE-D

Mass Memory Unit B (MMU-B) was initialized (12:56-13:18) to configure fault protection after the switch-over.

This resulted in a corresponding data gap as no data is recorded during this activity.

At 16:05 the Star Tracker Assembly Electronics (STRE-A) was switched on again in preparation for a mode transition to AOCS mode NOM.

As all missing Non-Science and Science data had been retrieved from the inactive MMU-A it was switched off (16:06).

Added by hywen from 2019-02-12 ops status report

2019-02-14 GRACE-D IMU1A time gap of ~21 s in IMU1A_2019-02-14_D_NYA_603417910.pass at 13:51:43, and SCA1A time gaps of 3 s at 603424301.529995 and 40 s at 603424315.529989 in SCA1A_2019-02-14_D_NYA_603417909.pass (hywen). Possible reason from status report:

"The Safemode configuration was updated (13:45) to always use MilBus-B in case of safe modes."

2019-02-18 GRACE-D IMU1A time gap of ~0.25 s in IMU1A_2019-02-18_D_NYA_603769690.pass; TelemPacketData.e hard-coded to discard one bad packet in 603770196

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

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

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

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

- Pitch maneuver at 05:48, 12:20, 15:28

- Yaw maneuver at 08:02, 18:25

- Roll maneuver at 10:45, 13:54 - efahnest

2019-02-28 GRACE-D At 11:49 the accelerometer (ACC) was powered on into Large Range Mode (LRM) and will stay there for the coming days(from 2019-02-28 status report) - hywen

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

2019-03-06 GRACE-C IPU soft restart at 13:25:40 in order to re-instate the desired IPU parameters - efahnest

2019-03-08 GRACE-D SCA star tracker software reboot at 15:24, resulting in 10-second gap in data at 605330645.5. Note that SCA1A_2019-03-08_D_NYA_605324349.pass contains a data point time-tagged "-630763193.469795" in that gap, which did not make it into SCA1A daily product - hywen

2019-03-11 GRACE-C SCA star tracker software reboot at 03:08, resulting in 10-second gap in data at 605545662.5. Note that SCA1A_2019-03-11_C_NYA_605545307.pass contains a data point time-tagged approximately "-630763193" in that gap, which did not make it into SCA1A daily product - hywen

2019-03-18 GRACE-C LRI commanded to reaquisition mode at 11:45 and transitioned to science mode after the GF2 LRI was ready at 13:22

GRACE-D LRI powered back on by OBCP at 13:06 and commanded into science mode at 13:22 - cmccullo

2019-03-19 GRACE-D orbit maintenance maneuver at 13:30:22.6000 lasting about 17 seconds - efahnest, per SOE entry by byun

For this short maneuver edit tcmTrees/graceCD_0.tree file: GstopSubSampleInterval 30 => GstopSubSampleInterval 15 - byun

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

GRACE-C IPU soft restart at 17:11:40 - efahnest

2019-03-26 GRACE-C performed CoM calibration - NOM-AH 2019-03-26 15:46 - 2019-03-27 03:40

- Yaw maneuver at 16:16, 17:50

- Roll maneuver at 19:39, 21:14

- Pitch maneuver at 22:49, ??:??, ??:?? - efahnest

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

- Roll maneuver at 13:22, ??:??

- Pitch maneuver at 15:20, 16:31, 18:05

- Yaw maneuver at 19:25, ??:?? - efahnest

2019-03-27 GRACE-C, GRACE-D CoM calibration continued See 2019-03-26 Log entries..

Thruster plateau test on both satellites beginning at ~13:30 - efahnest

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

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

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

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

- 12:53 - 12:56 Pitch maneuver at longitude -32Â°, latitude between 1.9Â° and 13.4Â° in sun

- 14:12 - 14:15 Pitch maneuver at longitude -54Â°, latitude between 61.5Â° and 72.9Â° in sun

- 15:21 - 15:24 Yaw maneuver at longitude 111Â°, latitude between 9.5Â° and 21.0Â° in eclipse

- 17:21 - 17:24 Pitch maneuver at longitude -101Â°, latitude between 61.9Â° and 73.4Â° in sun

- 20:30 - 20:33 Roll maneuver at longitude -149Â°, latitude between 62.4Â° and 73.8Â° in sun

- 23:39 - 23:42 Roll maneuver at longitude 163Â°, latitude between 62.9Â° and 74.3Â° in sun

GRACE-D performed CoM calibration from 13:47 to 22:05 ? - mpaik

- 13:47 - 13:50 Yaw maneuver at longitude 135Â°, latitude between 10.2Â° and 21.7Â° in eclipse

- 15:47 - 15:50 Pitch maneuver at longitude -78Â°, latitude between 61.2Â° and 72.7Â° in sun

- 16:56 - 16:59 Yaw maneuver at longitude 87Â°, latitude between 9.7Â° and 21.2Â° in eclipse

- 18:56 - 18:59 Pitch maneuver at longitude -125Â°, latitude between 61.7Â° and 73.1Â° in sun

- 22:05 - 22:08 Roll maneuver at longitude -173Â°, latitude between 62.2Â° and 73.6Â° in sun

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

- 01:29 - 01:32 Yaw maneuver at longitude 138Â°, latitude between 3.9Â° and 15.4Â° in sun

GRACE-D performed CoM calibration from 00:49 to 02:52 - mpaik

- 00:49 - 00:52 Pitch maneuver at longitude -31Â°, latitude between 10.4Â° and 21.9Â° in eclipse

- 02:49 - 02:52 Roll maneuver at longitude 116Â°, latitude between 61.0Â° and 72.4Â° in sun

GRACE-C IPU soft restart was commanded at 09:55:40.00 in order to increase the number of tracked satellites back to normal - efahnest

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 - hywen

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 - hywen

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 - byun

Grace-C SPID14001 sampling rate was increased at 09:46

Grace-D SPID14001 sampling rate was increased at 08:12

Extended Grace-D quaternions file at the end to make orbit work - byun

2019-05-03 GRACE-D IPU soft restart was commanded at 10:02:10.00 in order to increase the number of tracked satellites back to normal - efahnest

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

GF1 IPU was not able to reacquire PRN 15 around that time and other GPS Satellites were at relatively low elevation

resulting in 781 second period in which IPU was not tracking enough satellites to produce Nav Solution. - tamarab (amended by efahnest)

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

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

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

2019-05-24 CoM calibration on both spacecraft - tamarab

GRACE-C: CMCal start: 20190523 23:30, CMCal end: 20190524 14:15

CMCal maneuvers: Pitch: 23:48, 09:29, 11:03

Roll: 06:21, 08:05

Yaw: 12:24, 13:59

GRACE-D: CMCal start: 20190524 00:10, CMCal end: 20190524 17:45

CMCal maneuvers: Pitch: 11:29, 15:48, 17:22

Roll: 03:12, 04:45,

Yaw: 00:27, 02:02

2019-05-28 GRACE-C IPU soft restart was commanded at 20:00:40.00 in order to increase the number of tracked GPS satellites - efahnest

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.

Notified Jeff Tien on IPU/MWA/GPS instrument team - hywen

2019-06-01 GRACE-C spontaneous IPU reboot at 09:23:10.0000 - efahnest

2019-06-05 GRACE-C Possible micrometeoroid impact at 12:47:33 (delta-v of approximately 0.113 microns/sec). - cmccullo

2019-06-06 GRACE-C ACC temperature calibration (brief test version) occurred from approximately 07:15 to 10:51 - efahnest

2019-06-07 GRACE-D spontaneous IPU reboot at 18:12:56, causing approx. 300s data gap - tamarab

2019-06-12 GRACE-C ACC temperature calibration started at approximately 06:30 - efahnest

2019-06-15 GRACE-C ACC temperature calibration finished at approximately 19:09 - efahnest

2019-06-20 Based on carrier-to-noise density ration observation(C/NO) of IGS receivers, global flex power operation was observed on 2019-06-20 and 2019-06-21. Flex power started subsequently for all healthy Block IIR-M and IIF satellites on June 20 between 15:18 and 17:49 UTC. C/N0 of the P(Y)-code tracking increased by roughly 10 dB for all healthy Block IIR-M and IIF satellites whereas C/N0 of the C/A-code decreased by about 2-3 dB for the healthy IIR-M satellites only. The changes in power levels are similar to flex power mode III discussed in "Steigenberger P, ThÃ¶lert S, Montenbruck O. (2019) Flex power on GPS Block IIR-M and IIF, GPS Solutions, doi:10.1007/s10291-018-0797-8". All satellites returned to normal power levels on June 21 between 6:00 and 10:00 UTC.

The above flex power degraded Grace-FO orbit performance to a few millimeter level. - byun

142-second gap in GNV1A on GRACE-C was caused by IPU tracking fewer than 4 Satellites during that interval (142 seconds).

Since the gap did not exceed the IPU internal no Nav Solution timeout of 240 seconds, it did not trigger a reboot. - mpaik

2019-06-21 See the entry of 2019-06-20

2019-06-22 CoM calibration on both spacecraft, extending into the next day - efahnest

GRACE-C: CMCal start: 20190622 22:30, CMCal end: 20190623 13:15

CMCal maneuvers: Pitch: 03:27, 06:35, 08:35

Roll: 09:55, 12:53

Yaw: 23:07, 00:42

GRACE-D: CMCal start: 20190622 20:26, CMCal end: 20190623 13:00

CMCal maneuvers: Pitch: 20:54, 22:52, 02:02

Roll: 05:11, 11:29

Yaw: 09:30, 12:39

2019-06-23 GRACE-D spontaneous IPU reboot at 09:23:30.0000 - efahnest

2019-06-27 GRACE-C spontaneous IPU reboot at 09:35:10.0000 - efahnest

2019-07-04 Starting on this date, GF1 IPU has not been outputting data from DSP channel 6 (subchannels 16 thru 18). This is likely due to SEU event causing that DSP channel to hang. Jeff will request from GSOC a soft restart of GF1 IPU. In the Leve1-1 POD performance report statistics, the percent edited of the GF1 GPS phase data is abnormally high (> 9%), as is the KBR-GPS diff RMS (> 2 mm) - hywen, and email from Jeff Tien on 2019-07-08 titled "Re: 2019-07-05 C performance stats"

2019-07-08 GRACE-C IPU S/W restart at 15:34:10 in order to reset an inactive DSP channel - mpaik

2019-07-11 GRACE-C IPU S/W restart at 16:06:00 in order to reset a hanging DSP channel - mpaik

2019-07-18 GRACE-C IPU reboot (commanded) at 04:11:40 - efahnest

GRACE-D IPU reboot (commanded) at 04:11:40 - efahnest

2019-07-20 GRACE-C IPU reboot (commanded) at 03:00:40 - tamarab

GRACE-D IPU reboot (commanded) at 03:00:40 - tamarab

2019-07-23 GRACE-C hardware channel 17 put out bad data from 5:29:30 to 2019-7-26 4:11:26 and these data were excluded except for GPS1A - mpaik

2019-07-24 GRACE-C GPS receiver channel 17 started putting out bad data starting around 05:22:00.

More specifically all data being tracked by channel 17 drifts linearly at a rate on the order of one km/hour. The data from channel 17 was all excluded for orbit processing - byun

From 2019-7-23 5:29:30 to 2019-7-26 4:11:26, data from L2-channel 17 were deleted from GPS1B and OD process for rl04 - mpaik

Grace-C CMCal started at 06:20 and ended at 16:35 - byun

Grace-D CMCal started at 17:00 and ended at 01:53 the following day - byun

2019-07-25 Grace-D CMCal which started at 17:00 the previous day ended at 01:53 - byun

Grace-C GPS1A telemetry data time tag out of order. Fixed it with combine.py -x option. - byun

Grace-C GPS data from channel 17 excluded for orbit processing - byun

2019-07-26 Grace-C GPS1A telemetry data time tag out of order. Fixed it with combine.py -x option. - byun

Grace-C GPS data from channel 17 excluded for orbit processing - byun

Grace-C IPU soft reset at 04:11:26 fixed channel 17 problem - byun

GRACE-C IPU reboot (commanded) at 04:11:40 - efahnest

GRACE-D IPU reboot (commanded) at 04:12:10 - efahnest

2019-07-27 Grace-C GPS1A telemetry data time tag out of order. Fixed it with combine.py -x option. - byun

2019-07-30 GRACE-C IPU reboot (commanded) at 04:40:40 - efahnest

GRACE-D IPU reboot (commanded) at 04:41:10 - efahnest

2019-08-03 GRACE-C IPU reboot (commanded) at 03:17:10 - efahnest

GRACE-D IPU reboot (commanded) at 03:17:40 - efahnest

2019-08-07 GRACE-D Repeated packets were removed from IMU1A_2019-08-07_D_NSG_618443950.pass (Data between 618452830 and 618452864) - mpaik

2019-08-09 GRACE-C IPU reboot (commanded) at 02:44:40 - mpaik

GRACE-D IPU reboot (commanded) at 02:45:10 - mpaik

2019-08-15 GRACE-D thruster plateau test was performed from 06:00 through 12:00.

For the test the satellite was in Attitude Hold Mode (NOM-AH).

LRI was in re-acquisition mode for about 1 hour (starting around 10 UTC). -tamarab

2019-08-26 GRACE-C CMCal started at 03:55 and will end at 19:10. Added by hywen on 2019-08-27, from Ops Status Report.

Yaw: 17:04, 18:39

Pitch: 04:28, 07:22, 10:33

Roll: 12:06, 15:16

2019-08-27 GRACE-D CMCal started at 03:30 and will end at 18:50. Added by hywen on 2019-08-27, from Ops Status Report.

Pitch: 04:07, 07:01, 10:11

Roll: 11:45, 14:55

Yaw: 16:43, 18:18

2019-08-30 GRACE-C IPU reboot (commanded) at 03:07:00.0 - efahnest

GRACE-D IPU reboot (commanded) at 03:07:20.0 - efahnest

2019-09-03 GRACE-C Frequent 3-second gaps in THR1A data for the duration of thruster plateau test, which started on 13:02 and will be finished at 2019-09-10 15:05 - hywen, from ops status reports

Email from Lukas Hoffman <L.Hoffmann@dlr.de> on 2019-09-09:

"The 3-second gaps are expected and related to the design of our thruster test procedure.

The procedure was originally created for the thruster test in March and includes an increasing of additional thruster telemetry (SPID14001) from 1/6 Hz to 1 Hz before the execution of the thrust and a reset to 1/6 Hz after the thrust.

During the telemetry rate change, the telemetry packet generation is disabled for two seconds before being enabled again with a new rate. Since the telemetry rate is currently set to 1 Hz by default, we changed the reset rate after the thrust from 1/6 Hz to 1Hz. This was the only way to re-use the validated procedure quickly without additional modifications. Unfortunately, as you noticed, this results in some "lost" samples between the thrusts."

2019-09-14 Grace-C GPS receiver channel 8 started having problem starting from 2019-09-14 15:44:10 per Mark Miller.

Edit problem persists until the next soft IPU reboot. For orbit processing edit channel 8 data.

$ dataRecordDump -file dataRecord.dr.gz | awk '{ if($1 < 621747810 || $18 != "\"GRAFO_L2_CHAN\":\"8\"") {print $0}}' | dataRecordUnDump -file new_dataRecord.dr.gz - byun

2019-09-15 Grace-C Phase data more than 10% edited out. Jeff Tien said much shorter arc length with DSP channel 3 (subchannels 6-8 (counts from 0) or 7-9 (counts from 1)). It is likely an SEU event on the DSP FPGA. Requested GSOC to soft restart Grace-C IPU. - byun

2019-09-16 The same GPS data problem as 2019-09-15. Data edited out per Mark Miller's instruction. - byun

The LRI dropped out of science for about 25 seconds on this day. LRI team is investigating the cause of this event.

It seems likely to be associated with the sun blinding of the LRI at beta angle 0 - byun

2019-09-17 GPS data before IPU reboot is edited out per Mark Miller's instruction - byun

GRACE-C IPU reboot (commanded) at 23:42:50 - efahnest

From 2019-09-14 15:43:30 to 2019-09-17 23:42:50, data for L2 on channel 8 were deleted except for GPS1A. Since the SNR for L2 on channel 8 during this period is actually fairly high (300-400), and its value in isolation isn't enough to determine that the data is bad. - mpaik

2019-09-19 GRACE-C The LRI TMA scans were executed from 10:00 through 11:24.

At 15:30 the setpoints for the ACC Thermal Control Loops 7 and 8 will be increased from 15Â°C to 18Â°C.

GRACE-D The LRI TMA scans were executed from 12:00 through 13:24. - mpaik

2019-09-20 LRI was rebooted at 6:00 on both satellites in order to resume Science Mode - LRI was in Re-Acquisition Mode since start of the scans yesterday. - mpaik

2019-09-22 GRACE-D spontaneous IPU reboot at 05:25:30 - efahnest

2019-09-26 GRACE-D At 15:30 the setpoints for the ACC Thermal Control Loops 7 and 8 will be increased from 15Â°C to 18Â°C. - cmccullo

2019-09-28 GRACE-C CMCal started at 04:35 and ended on 2019-09-29 at 02:43. Added by efahnest on 2019-09-30, from Ops Status Report.

Yaw: 04:32, 02:36 (next day)

Pitch: 14:15, 15:50, 01:41 (next day)

Roll: 18:59, 22:08.

GRACE-D CMCal started at 02:06 and ended at 16:21. Added by efahnest on 2019-09-30, from Ops Status Report.

Pitch: 02:03, 06:23, 09:31

Roll: 11:06, 12:41

Yaw: 14:39, 16:14

2019-10-03 GRACE-C spontaneous IPU reboot at 07:07:40.0000- efahnest

KBR Missed Interrupt triggered at 11:47:25.0000

KBR not restored until after K/Ka Band tracker was restarted, 03-OCT-2019 20:36:00.0000 - efahnest

2019-10-06 GRACE-D commanded IPU reboot at 15:41:30, to cure GPS data instability starting 2019-10-06 ~14:30 - efahnest

2019-10-10 GRACE-C commanded IPU reboot at 20:26:40 - efahnest

2019-10-16 GRACE-C K-band SNR dropped significantly at 13:42. The SNR drop started over the SAA region and was likely caused by an SEU event.A commanded IPU S/W restart on 2019-10-17 at 09:11:40 over Arctic Ocean cured the problem. - tamarab

Changed status of registry KBR1A.dat to 'S' - mpaik

GRACE-C Possible micrometeoroid impact at 22:11:00 (delta-v of approximately -0.229 microns/sec). - cmccullo

2019-10-17 GRACE-C commanded IPU restart at 09:11:40 - tamarab

Changed status of registry KBR1A.dat to 'S' - mpaik

2019-10-23 GRACE-C Possible micrometeoroid impact at 00:56:31 (delta-v of approximately 0.105 microns/sec). - cmccullo

2019-10-25 LRI dropped the link and reacquired, resulting in a approx. 27s gap in LRI1A data of both spacecraft. The reason of this event is still under investigation. -tamarab

2019-10-28 GRACE-D commanded IPU reboot at 22:09:20, to cure a drop in the number of tracked GPS satellites (since day 299) - mpaik

2019-10-30 GRACE-D In preparation of the planned ACC relay test, a test with thrusters disabled for 15 min (05:53 through 06:08) has been executed in order to check the attitude deviations (NOM-AH mode from 05:43 through 06:18). -tamarab

2019-11-05 GRACE-D IPU reboot at 21:06:30 - mpaik

2019-11-06 GRACE-C IPU reboot (planned) at 20:07:40 - mpaik

GRACE-D IPU reboot (planned) at 20:07:40

GRACE-D Another IPU reboot occurred at 20:16:40

2019-11-08 GRACE-D GPS occultation antenna was unintentionally switched-on at 20:33, but it was switched off again at 22:03 -tamarab

2019-11-11 GRACE-D IPU reboot at 22:49:20 -tamarab

2019-11-17 GRACE-D IPU reboot at 09:22:30 -tamarab

2019-11-18 GRACE-D ACC relay test: At 16:25 the ACC relay was opened for 3 minutes while the thrusters were disabled for 15 minutes (16:19-16:34).

GF2 was commanded to NOM-AH (14:35-18:24) and event/action of OBCP14 (AOCS ASM Setup) was disabled. For comparison, before and after the relay test thrusters were disabled for 15 minutes while the relay remains closed (14:45-15:00, 17:54-18:09). -tamarab

2019-11-19 GRACE-D The ACC relay test was continued - the thrusters were disabled for 15 minutes (12:41-12:56) interrupted by a single +roll/-roll thrust firing (12:48) during the 3 minutes with relay open (12:46-12:49). GF2 was in NOM-AH (12:31-13:11) and event/action of OBCP14 (AOCS ASM Setup) was disabled. Another test was performed in the afternoon - the thrusters were disabled from 16:11 to 16:17 and the ACC relay opened from from 16:13 to 16:16. During that time a single +yaw/-yaw thrust firings (16:15:00 and 16:15:15) were commanded. GF2 was in NOM-AH from 16:10 to 16:32. Event/action of OBCP14 (AOCS ASM Setup) was disabled yesterday at 16:10 and was enabled today at 07:44.

LRI dropped to Re-Acquisition Mode at 12:52 - tamarab

2019-11-20 GRACE-C IPU reboot at 18:07:40

GRACE-D in the morning a 20min ACC relay test in NOM-FP was performed: the relay was opened from 06:08 to 06:28.

Afterwards a 24h relay test in NOM-FP was started. The relay was opened at 07:48 and was closed on 2019-11-21 at 5:47.

The relay was open for 22h, which resulted in unexpected trends in the data - tamarab

2019-11-21 GRACE-C IPU reboot at 21:45:40

GRACE-D IPU reboot at 21:45:40 - tamarab

2019-11-29 GRACE-C IPU reboot at 18:47:40 - efahnest

2019-12-04 GRACE-D STRE-A reboot at 20:41 - mpaik

2019-12-10 GRACE-D IPU reboot at 09:44:10 - mpaik

2019-12-12 Four LRI reboots were commanded (05:37-05:46) in order to check whether all four flight software images are still booting correctly.

Since then LRI is in re-acquisition mode because the LRI parameter fit has been uploaded to GF2 only yet.The GF1 upload was attempted

around 17:25 but the LRI was not able to lock into Science Mode after the commanded reboots. - byun

2019-12-13 After 24h in Re-Acquisition Mode it switched autonomously into Diagnostic Mode at 05:47.

It has been determined that reason for that was incompatibility between new STR quaternions uploaded earlier this week and LRI offsets parameters.

Later today the STR quaternions will be reset into their original values and LRI will be rebooted. - byun

2019-12-15 GRACE-D IPU reboot at 19:59:59. K-band SNR dropped before IPU reboot. - mpaik

2019-12-20 GRACE-C IPU reboot at 04:52:40

GRACE-D IPU reboot at 04:53:10 - mpaik

2019-12-22 GRACE-C IPU reboot at 00:49:00 - tamarab

2019-12-30 GRACE-D L2P tracking on channel 5 goes bad after 2019-12-30 01:29:20 GPS

(channel 5 presumably bad until next IPU reboot on D) - mmiller

2020-01-02 GRACE-D IPU reboot at 17:29:40 - tamarab

2020-01-04 GRACE-C IPU reboot at 20:58:50 - tamarab

2020-01-08 GRACE-C IPU reboot at 19:30:50

IPU reboot at 21:46:10 - mpaik

GRACE-C KBR Missed Interrupt started from 22:00:54

2020-01-10 GRACE-C K/Ka-band trackers were restarted at 01:54:00 in order to cure an ongoing Missed Interrupt condition.

GRACE-C IPU reboot (commanded) at 09:49:40 - efahnest

GRACE-D IPU reboot (commanded) at 09:50:00 - efahnest

2020-01-14 GRACE-D K-band SNR dropped significantly at 22:48.The SNR drop started over the Arctic Ocean and was likely caused by an SEU event in a DSP channel.

A commanded IPU S/W restart (2020-01-15 at 03:23 over the Norwegian Sea) cured the problem. - mpaik

2020-01-15 GRACE-D IPU reboot (commanded) at 03:23:40 - mpaik

2020-01-17 GRACE-D IPU reboot (spontaneous) at ~07:43:24

GRACE-C IPU reboot (commanded) at 08:49:40

GRACE-D IPU reboot (commanded) at 08:49:40 - efahnest

2020-01-18 KBR and LRI link was lost after GF2 switched to AOCS Safe Mode at 05:05.

GRACE-C AOCS pointing was changed to nadir at 15:10 to account for the missing inter-satellite measurements.

GRACE-C two IPU reboots at 17:30:40 and at 17:42:30.

GRACE-D IPU, MWA, LRI and STR are switched off since 05:05. The satellite is in AOCS Safe Mode.

At 05:05 the O/B Time changed to year 2037. It resulted in the cleaning of the MTL and drop to AOCS Safe Mode. - mpaik, tamarab

2020-01-19 GRACE-C IPU reboot at 3:45:26 (commanded), K/Ka trackers were disabled

GRACE-D IPU, MWA, LRI and STR are switched off since 18-Jan-2020. The sallite is in Safe Mode (ASM)

LRI switched to Diagnostic Mode after being in Re-Acquisition Mode for 24 hours

2020-01-20 GRACE-C radio occultation measurements were disabled in the IPU at 14:25

GRACE-D IPU, MWA, LRI and STR are switched off since 18-Jan-2020. The sallite is in Safe Mode (ASM)

GRACE-D at 12:30 the MMU pointer management of the HK (non-science) store was corrected - about 4 hours of HK data is lost

LRI is in Diagnostic Mode - tamarab

2020-01-21 GRACE-D IPU, MWA, LRI and STR are switched off since 18-Jan-2020. The sallite is in Safe Mode (ASM)

GRACE-D At 14:05 the MMU pointer management of the science data store was corrected - resulting in about 10 minutes of science data loss.

The thermal loops of IPU-A, MWA-A, LRI and ACC were configured for instrument operations during the same contact.

LRI is in Diagnostic Mode - tamarab

2020-01-22 GRACE-D IPU-A was switched on at 09:37. STRE-A was switched at 12:00. Transition to NOM-AH mode was executed at 12:05.

MWA and LRI are switched off since 18-Jan-2020.

LRI is in Diagnostic Mode - tamarab

2020-01-23 GRACE-C At 14:52 the pointing frame was switched from nadir to relative pointing. Radio occultation measurements are disabled in the IPU.

GRACE-D At 10:03 the synchronization of the on-board time with GPS was activated.

Shortly after the pointing frame was switched from nadir to relative pointing.

the MMU delete pointer movement via timetags in the MTL was re-activated at 10:03.

The transition to NOM-FP mode was successfully executed at 13:20.

MWA-A was powered on at 14:42, but KBR tracking continues to be disabled.

IPU reboot at 17:15:33, which activated the K/Ka-band measurements.

LRI is in Diagnostic Mode. - tamarab

2020-01-24 GRACE-C IPU reboot (commanded) at 10:00:40 after which KBR data becomes available again

GRACE-D IPU reboot (commanded) at 10:00:40 after which KBR data becomes available again - efahnest

2020-02-01 GRACE-C Center-of-Mass Calibrations (CMCal) were performed as preparations for trim mass movement. CMCal maneuvers were executed on 01-Feb at:

Pitch: 04:49, 06:37, 08:12

Roll: 09:46, 11:21

Yaw: 17:25, 19:00

2020-02-05 GRACE-D GPS1A bad data in channel 1 and 2 starting from 2020-02-05 16:52:40 until 2020-02-07 13:25:00. This data has been excluded in orbit processing. - tamarab

2020-02-06 GRACE-C performed mass trims - At 12:41 the Mass Trim Electonics (MTE-A) was switched on.

- At 12:45 the trim mass was moved in -x direction by 5453 steps (i.e. -13.633 mm) for a change in the center of mass of -113.0 Âµm.

- At 12:52 the MTE-A was switched off. LRI collected cavity diagnostic data during the mass trim. - mpaik

The LRI on both satellites collected diagnostic data during the mass trim on GF1. Both instruments were commanded to diagnostic mode at 12:40 and back to

reacquisition mode at 13:30. LRI science mode resumed at 13:31.

GRACE-D GPS1A bad data in channel 1 and 2 starting from 2020-02-05 16:52:40 until 2020-02-07 13:25:00. This data has been excluded in orbit processing.

2020-02-07 The inter-satellite measurements (KBR, LRI) are interrupted.

GRACE-C The On-Board Time suddenly changed to an epoch in the future (as on GF2 on day 18) - this time about 3 days ahead.

Thus the satellite dropped to Safe Mode and OBCP-14 was triggered resulting in the cleaning of the MTL and switching all

instruments (except USO and ACC) off (10:35). IPU, MWA, LRI and STR are switched off.

At 12:30 the O/B time was reset from ground and the MTL was re-enabled. At 14:05 dumps were successfully performed over

the time jump and the MTL was re-loaded. The delete pointer management is still disabled

GRACE-D AOCS pointing was changed to nadir pointing at 12:30 to account for the missing inter-satellite measurements.

The IPU was restarted at 13:20 with disabled K/Ka trackers (over Antarctica/Ross Ice Shelf).

GPS1A bad data in channel 1 and 2 starting from 2020-02-05 16:52:40 until 2020-02-07 13:25:00. This data has been excluded in orbit processing. - mpaik

2020-02-08 GRACE-C no KBR and LRI measurement

GRACE-D no KBR and LRI measurement - tamarab

2020-02-09 GRACE-C no KBR and LRI measurement

GRACE-D no KBR and LRI measurement - tamarab

2020-02-10 GRACE-C no KBR and LRI measurement

At at 11:33 STRE-A was switched on in preparation of the mode change to NOM-AH (12:53).

IPU-B was powered on at 12:55, but the wrong UART interface has been selected and the IPU rebooted again.

Therefore at the next opportunity (14:35) the IPU was switched off again.

The pass files of 2020-02-07 were removed from passfilelist of 2020-02-10 because O/B time of GRACE-C had jumped to 3 days ahead on 2020-02-07. - mpaik

GRACE-D no KBR and LRI measurement - tamarab

2020-02-11 GRACE-C no KBR and LRI measurement

IPU-B was successfully powered on at 12:38. - mpaik

GRACE-D no KBR and LRI measurement - tamarab

2020-02-12 GRACE-C no KBR and LRI measurement

At 12:26 IPU S/W was restarted because unexpected error events were received. At 12:29 the delete pointer management was resumed

At 13:52 the synchronization of the on-board time with GPS was activated. At 13:56 MWA-B was successfully powered on. - mpaik

GRACE-D no KBR and LRI measurement - tamarab

2020-02-13 GRACE-C no LRI measurement

At 11:15 the transition to NOM-FP mode was successfully executed.

In order to set up the K/Ka-band tracking a restart of the IPUs was successfully performed at 11:30:40 - mpaik

GRACE-D no LRI measurement - tamarab

2020-02-14 GRACE-C At 01:57 LRI was powered on and at 02:05 it entered science mode.

Ongoing Center-of-Mass Calibrations (CMCal) to verify the recent mass trim movement. The following CMCal maneuver are being executed (in NOM-AH):

Pitch: 03:17, 06:50, 08:25

Roll: 11:34, 13:08

Yaw: 05:30, 17:27

GRACE-D At 02:01 LRI was commanded to auto-acquisition Mode and at 02:05 it entered science mode. - mpaik

GRACE-C IPU reboot (commanded) at 09:00:40 - efahnest

GRACE-D IPU reboot (commanded) at 09:00:40 - efahnest

2020-02-17 GRACE-C IPU reboot (spontaneous) at 07:32:50 - efahnest

2020-02-18 GRACE-D IPU reboot (spontaneous) at 14:41:10 - tamarab

2020-02-20 GRACE-C LRI dropped to re-acquisition mode at 18:54 and resumed science mode shortly after at 20:28

GRACE-D LRI dropped to re-acquisition mode at 18:54 and resumed science mode shortly after at 20:28 - tamarab

2020-02-21 GRACE-C IPU reboot (commanded) at 07:44:40

GRACE-D IPU reboot (commanded) at 07:44:40 - tamarab

GRACE-C Excluded bad data of L2 channel 26 in GPS1A from 2020-02-18 03:19:20 to 2020-02-20 07:44:40 - mpaik

2020-02-22 GRACE-D IPU reboot (spontaneous) at 22:55:50

KBR SNR drop between 635683339 and 635684379 - tamarab

2020-02-28 GRACE-C IPU reboot (spontaneous) at 16:56:50 - tamarab

2020-03-02 GRACE-C IPU reboot (commanded) at 11:36:30 - efahnest

2020-03-03 GRACE-C At 22:57 a mode transition to ASM occurred. OBCP_14 was executed and all instruments (except USO and ACC) were switched-off.

It was caused by accidentally uplinking a command which disabled the attitude control thrusters.

Recovery actions were executed:

At 23:48 the attitude control thrusters were re-enabled.

At 07:51 the thermal loops of IPU-B, MWA-B, LRI and ACC were configured for instrument operations.

At 09:16 STRE-A was switched on.

At 09:20 the mode transition to NOM-FP was performed.

At 10:13 IPU-B was switched on (over Antarctica).

At 11:08 the synchronization of the on-board time with GPS was activated.

At 11:30 the pointing frame was switched from nadir to relative pointing.

At 12:37 MWA-B was switched on.

At 14:10 LRI was switched on.

IPU S/W was successfully updated to version V4.3:

At 11:51 FlashFileLib was uploaded and installed.

At 13:23 IPU-B was restarted and the new S/W was activated (over Antarctica).

2020-03-04 - 2020-03-05 KBR1B may be degraded due to thermal effects because the heaters/MWI were off 13 hours - Kruizinga

GRACE-C IPU reboot (spontaneous) at 10:16:40 - efahnest

GRACE-C IPU reboot (commanded) at 13:28:10 - efahnest

2020-03-08 GRACE-D spontaneous reboot of the LRI was experienced at 2020-03-08 02:48:20

GRACE-C LRI: short period in Reacquisition Mode due to LRI reboot on GF2 - tamarab

2020-03-10 GRACE-C IPU reboot (commanded) at 10:09:50 - efahnest

2020-03-14 GRACE-D Two IPU reboots (spontaneous) were experienced at 13:25:20 and 13:48:50 - mpaik, efahnest

2020-03-18 GRACE-C IPU reboot (spontaneous) at 00:11:30 - mpaik

2020-03-19 GRACE-D IPU reboot (commanded) at 23:34:40 - mpaik

2020-03-26 GRACE-C IPU reboot (spontaneous) at 01:06:30 - efahnest

2020-04-03 GRACE-D IPU reboot (commanded) at 21:20:40 - mpaik, efahnest

2020-04-14 GRACE-D IPU reboot (commanded) at 10:58:10 - mpaik

2020-04-15 GRACE-C IPU reboot (spontaneous) at 07:10:30 - mpaik, efahnest

2020-04-24 GRACE-D IPU reboot (commanded) at 10:38:40 - mpaik

2020-04-25 GRACE-C IPU reboot (spontaneous) at 15:09:10 - mpaik

2020-04-27 GRACE-D L1 data on channel 22 is useless after 2020-04-27 21:22:00 due to lower SNR - mpaik

2020-05-01 GRACE-D IPU S/W was restarted at 08:08:40 in order to resume nominal output of IPU DSP channel 22.

GPS data on channel 22 are useless until 08:08:40 due to lower SNR - mpaik

GPS channel 31 went bad at 20:21:40 due to lower SNR - mpaik

2020-05-04 GRACE-D IPU reboot (commanded) at 18:53:40 to fix above issue - efahnest

2020-05-08 GRACE-D IPU reboot at 14:14:40 - tamarab

2020-05-09 GRACE-C CMCal Center-of-Mass calibrations maneuver

Yaw: 10:26, 12:01

Pitch: 13:49, 15:23, 21:28

Roll: 16:58, 18:33 - tamarab

2020-05-14 GRACE-C At 8:38 the Mass Trim Electronics (MTE-A) was switched on.

At 8:42 the trim mass was moved in -z direction by 1544 steps (i.e. -3.86 mm) for a change in the center of mass of -32.0 Âµm.

The MTE-A was switched off at 08:50.

The LRI on both satellites collected diagnostic data during the mass trim on GF1. Both instruments were commanded to diagnostic mode

at 8:30 and back to auto acquisition mode at 9:30 resuming LRI science mode. - mpaik

2020-05-15 GRACE-D IPU reboot (commanded) at 03:47:40 in order to resume tracking to all available GPS satellites. - mpaik

GRACE-C Center-of-Mass Calibrations (CMCal) were performed to verify the recent mass trim movement.

CMCal maneuvers were executed on 15-May:

Yaw: 21:28, 23:03 - tamarab

2020-05-16 GRACE-C IPU reboot (spontaneous) at 13:03:20 over North Pole

Center-of-Mass Calibrations (CMCal) were performed to verify the recent mass trim movement.

CMCal maneuvers were executed on 16-May:

Roll: 01:47, 03:21

Pitch: 04:56, 06:30, 08:30 - tamarab

2020-05-22 GRACE-D IPU reboot (commanded) at 17:15:40 over the Bering Sea - efahnest

2020-05-26 GRACE-D At 16:14 ACC was transitioned to Bias Verification Mode 2 (BVM2). It will stay in this mode for seven days. - mpaik

2020-05-27 GRACE-C IPU reboot (commanded) at 04:09:20 over the North Pacific Ocean - efahnest

Missed Interrupt seen in KBR data starting at 5:00 - mpaik

2020-05-28 GRACE-C A second Missed Interrupt occurred shortly after the K/Ka Band tracker was restarted yesterday.

A RestartTracker command was again issued this morning at 03:59, which corrected the problem. - mpaik

2020-05-29 GRACE-D IPU reboot (commanded) at 00:12:40 - mpaik

2020-06-02 GRACE-D The ACC was transitioned to Nominal Range Mode (NRM) at 13:53.

GRACE-C IPU reboot (commanded) at 16:39:00 - efahnest

The Star Tracker quaternions for trackers 2 & 3 were updated today at 16:01. This is to enable smoother transitions between star trackers. -tamarab

2020-06-03 GRACE-C IPU reboots (spontaneous) at 00:38:00 and then at 00:47:40 - efahnest

Missed Interrupts seen in KBR (a whole series of them) starting 03-JUN-2020 01:15:55.1

up until a RestartTracker command was issued 03-JUN-2020 11:09:10.0 - efahnest

LRI: spontaneous reboot of the LRI was experienced on GF1 at 12:34:09.0 - efahnest

2020-06-04 GRACE-C IPU reboot (spontaneous) at 00:18:10 - efahnest

2020-06-09 GRACE-C IPU reboot (spontaneous) at 23:33:20 - tamarab

2020-06-18 GRACE-D The LRI parameter file upload was performed:

At 08:00 LRI was commanded to Diagnostic Mode and parameter files were uplinkded.

At 12:30 parameter files were installed.

At 13:00 LRI was rebooted with new parameter files.

At 13:25 LRI was back in Science Mode

2020-06-18 GRACE-C Gap in MWI Science Data from 2020-06-18 23:04:34.45 to 2020-06-19 02:14:34.54 due to unkown reason - mpaik

This issue is due to an improperly processed passfile. The passfile was processed properly for v04, meaning no gap is present in the v04 data - cmccullo

2020-06-19 GRACE-C IPU reboot (commanded) at 03:30:22

GRACE-D IPU reboot (commanded) at 03:30:26

2020-06-20 GRACE-D IPU reboot (spontaneous) at 03:20:20

2020-06-23 GRACE-C Large impulsive signature (most likely an impact) is present in the GF1 ACC data around 14:01:50. This can be seen in the KBR and LRI data as well (most noticeably in Level-2 pre/post fits - cmccullo

2020-06-24 GRACE-C A test MWI calibration maneuver (wiggle test) was performed:

At 13:57 attitude pitch bias was set to -2 deg

At 14:02 two cycles (250sec length) of sinusoidal oscillation along pitch axis were performed. - mpaik

2020-06-26 GRACE-C IPU reboot (commanded) at 17:32:50 - efahnest

KBR MI occurred on 2020-06-26 after 21:00 (22:10:30 ?). K/Ka Band tracker was restarted on 2020-06-27 at 02:40:20. - tamarab, efahnest

GRACE-D IPU reboot (commanded) at 17:25:40 - mpaik, efahnest

2020-06-27 GRACE-D Bad GPS channel 16 data, must be removed from the solution, from 2020-06-27 at 17:30:00 until 2020-07-01 03:35:26

2020-07-01 GRACE-D IPU reboot (commanded) at 03:35:40 - tamarab

2020-07-09 GRACE-C IPU reboot (commanded) at 22:48:40

GRACE-D IPU reboot (commanded) at 22:42:40 - tamarab

2020-07-14 GRACE-C IPU reboot (commanded) at 23:56:40

GRACE-D IPU reboot (commanded) at 23:51:40 - mpaik

2020-07-16 GRACE-C IPU reboot (spontaneous) at 13:51:10 - mpaik

2020-07-17 GRACE-D IPU reboot (spontaneous) at 20:43:10 - cmccullo

2020-07-20 GRACE-D IPU reboot (spontaneous) at 13:08:50 - cmccullo

2020-07-24 GRACE-C IPU reboot (spontaneous) at 21:41:30 - cmccullo

2020-07-28 ~ 2020-07-29 There was an SEU event on GRACE D IPU resulting in the drop in the number of tracks. The issue was resolved after a command reboot sent on July 29. - mpaik

2020-07-29 GRACE-D IPU reboot (commanded) at 11:14:20 - mpaik

2020-08-05 GRACE-C IPU reboot (spontaneous) at 17:24:40 - cmccullo

Shortly following the reboot a Missed Interrupt occurred continuing into the next day.

2020-08-06 GRACE-C KBR restart tracker command was sent at 09:51, which cured the problem temporarily;

however, another Missed Interrupt occurred so a soft restart of the IPU will be commanded at ~22:48. - cmccullo

IPU reboot (commanded) at 22:56:20 - this corrected the MI - There is no LRI datation value for this span until the next reboot - cmccullo

2020-08-07 GRACE-C LRI CNR scan conducted from 00:00 - 03:20 (specifically 00:27:28 - 00:47:29, 01:20:30 - 01:37:36, 02:11:32 - 02:31:43, 03:00:34 - 03:16:35)

GRACE-D LRI CNR scan conducted from 04:00 - 07:20 (specifically 04:32:40 - 04:44:55, 05:21:43 - 05:33:00, 06:13:46 - 06:25:46, 07:00:48 - 07:13:49)

Gaps are present in the LRI products corresponding to the above scan times.

GRACE-C IPU reboot (commanded) at 09:34:40

IPU reboot (spontaneous) at 18:07:50

GRACE-D IPU reboot (commanded) at 09:30:40

2020-08-08 GRACE-D IPU reboot (spontaneous) at 04:38:00 - cmccullo

2020-08-09 GRACE-C IPU reboot (spontaneous) at 20:36:30 - efahnest

2020-08-11 GRACE-C IPU reboot (spontaneous) at 16:42:00 - mpaik

2020-08-12 The reacquisition at the end of the low Carrier-to-Noise-Ratio (CNR) test (performed last week) happened before the differential wavefront sensing pointing offset had been restored to 0. A reacquisition of the LRI was commanded at 20:37. This restored gain as well as in-phase and quadrature-phase amplitude values back to nominal resulting in ~110s gaps in LRI1A data of both spacecraft. - mpaik

The contents of the On-Board Control Procedures (OBCPs) onboard the satellites were downlinked (GF2 20:58 and GF1 22:34). The contents and CRCs in both RAM and EEPROM match expectations. This activity satisfies the precondition for next week's OBCP update.

2020-08-18 GRACE-C OBCPs 12, 26, and 55 were uploaded and updated. - cmccullo

2020-08-19 GRACE-D OBCPs 12, 26, and 55 were uploaded and updated. - cmccullo

Channels 31 and 32 went bad around 04:42:00. An IPU reboot will be commanded to fix the issue. - cmccullo

2020-08-21 GRACE-D IPU reboot (commanded) at 10:45:40 to resume nominal output of DSP channels 31 and 32

IPU reboot (commanded) at 21:35:40

GRACE-C IPU reboot (commanded) at 21:40:20

The reboots around 21:35:20 were commanded to resume tracking to all available GPS satellites after GPS PRN #13 was disabled from 08:00 - 21:30 for an announced period of unavailability. - cmccullo

2020-08-22 GRACE-C IPU reboot (spontaneous) at 04:02:10

2020-08-25 GRACE-D IPU reboot (spontaneous) at 02:11:30 - mpaik

2020-08-26 GRACE-D A test MWI calibration maneuver (wiggle test) was performed:

At 10:00 attitude pitch bias was set to -2 deg

At 10:05 two cycles (250sec length) of sinusoidal oscillation along pitch axis were performed. - mpaik

Nominal AOCS settings restored at 10:38

2020-08-28 GRACE-C IPU reboot (spontaneous) at 20:07:00 - mpaik

2020-09-08 GRACE-D IPU reboot (spontaneous) at 02:31:10 - efahnest

2020-09-09 GRACE-D An orbit maneuver was performed at 08:15 for 5 seconds (providing a delta-v of 0.065 cm/s) to reverse the drift between the spacecraft. - cmccullo

2020-09-10 GRACE-C IPU reboot (spontaneous) at 12:52:00 - cmccullo

2020-09-15 GRACE-D IPU reboot (spontaneous) at 00:52:40 - mpaik

2020-09-17 GRACE-C Ongoing KBR calibration: started at 05:27 and ended at 16:30.

KBR calibrations maneuvers:

-pitch from 05:37 to 06:40

+pitch from 08:46 to 09:49

-yaw from 11:55 to 12:58

+yaw from 15:04 to 16:07

LRI dropped to re-acquisition mode while KBR calibration maneuvers were executed on GF1.

2020-09-18 GRACE-C IPU reboot (spontaneous) at 00:33:50 - mpaik

2020-09-23 GPS PRN #32 was disabled from 2020-09-22 19:45 to 2020-09-23 09:15 due to an announced period of unavailability.

The following IPU reboots were commanded to resume tracking to all available GPS satellites.

GRACE-D IPU reboot (commanded) at 09:40:40

GRACE-C IPU reboot (commanded) at 09:46:20 - cmccullo

2020-09-24 GRACE-D Large impulsive signature (most likely an impact) is present in the GF2 ACC data around 22:32:11. This can be seen in the KBR and LRI data as well (most noticeably in Level-2 pre/post fits - cmccullo

2020-09-27 a significant KBR SNR drop on GF2 around 23:16 just before the IPU reboot. - mpaik

GRACE-D IPU reboot (spontaneous) at 23:20:40

2020-09-28 GRACE-D Ongoing KBR calibration: started at 04:55 and ended at 16:00.

KBR calibrations maneuvers:

-pitch from 05:05 to 06:08

+pitch from 08:15 to 09:18

-yaw from 11:25 to 12:28

+yaw from 14:35 to 15:38

LRI dropped to re-acquisition mode while KBR calibration maneuvers were executed on GF2.

2020-10-02 GRACE-C IPU reboot (spontaneous) at 04:59:20 - mpaik

2020-10-03 GRACE-C IPU reboot (commanded) at 19:07:20

GRACE-D IPU reboot (commanded) at 19:02:40 - mpaik

2020-10-08 GPS PRN #19 is disabled in the IPUs (07:00 - 20:30) due to an announced period of unavailability

The following IPU reboots are to resume tracking to all available GPS satellites

GRACE-D IPU reboot (commanded) at 21:00:40

GRACE-C IPU reboot (commanded) at 21:05:50 - cmccullo

2020-10-09 GRACE-D IPU reboot (spontaneous) at 00:51:40 - cmccullo

2020-10-12 GRACE-D IPU reboot twice (spontaneous) at 02:15:40 and at 02:32:30 - mpaik

The second time the IPU rebooted from the default library and hard-coded parameters were loaded (occultation antenna switched on).

A clean-up to re-instate parameters was performed at 06:04 (occultation antenna switched off).

GRACE-C IPU reboot (spontaneous) at 17:49:40 - mpaik

2020-10-13 GRACE-C IPU reboot (spontaneous) at 17:29:50 - mpaik

2020-10-15 GRACE-C L2C Radio Occultation measurements for PRN 4,7 and 18 were enabled in the IPU at 16:20.

2020-10-16 GRACE-C IPU reboot (commanded) at 23:36:30

GRACE-D IPU reboot (commanded) at 23:32:30

GPS PRN#1 was disabled in the IPUs (10:00 - 23:30) due to an announced period of unavailability. - mpaik

2020-10-18 GRACE-D IPU reboot (spontaneous) at 15:40:00 - cmccullo.

2020-10-20 GRACE-C IPU reboot (spontaneous) at 23:34:50 - efahnest

GRACE-D IPU reboot (spontaneous) at 16:15:50 - efahnest

GRACE-D IPU reboot (spontaneous) at 21:53:20 - efahnest

GRACE-D IPU reboot (spontaneous) at 23:28:50 - efahnest

GRACE-C CoM Calibrations:

09:20:30 â€“ 09:23:30 / PITCH / lon = -48Â° / 8Â° < lat < 20Â°

11:09:00 â€“ 11:12:00 / ROLL / lon = -73Â° / 61.8Â° < lat < 73.2Â°

12:44:00 â€“ 12:47:00 / ROLL / lon = -97Â° / 63.6Â° < lat < 75.0Â°

14:18:00 â€“ 14:21:00/ PITCH/ lon = -120Â° / 61.5Â° < lat < 72.9Â°

15:53:00 â€“ 15:56:00 / PITCH/ lon = -144Â° / 63.2Â° < lat < 74.6Â°

21:57:00 â€“ 22:00:00 / YAW / lon = 121Â° / 9.1Â° < lat < 20.5Â°

23:32:00 â€“ 23:35:00 / YAW / lon = 98Â° / 10.7Â° < lat < 22.2Â°

GRACE-D CoM Calibrations:

10:00:30â€“ 10:03:30 / YAW / lon = 121Â° / 20.1Â° > lat > 8.6Â°

11:35:00â€“ 11:38:00 / YAW / lon = 97Â° / 20.4Â° > lat > 8.8Â°

12:55:00 â€“ 12:58:00 / ROLL / lon = 74Â° / 76.0Â° > lat > 64.6Â°

14:29:00 â€“ 14:32:00 / ROLL / lon = 50Â° / 78.0Â° > lat > 66.7Â°

16:05:00 â€“ 16:08:00/ PITCH/ lon = 27Â° / 72.6Â° > lat > 61.2Â°

17:38:00 â€“ 17:41:00 / PITCH/ lon = 3Â° / 78.5Â° > lat > 67.1Â°

21:02:00 â€“ 21:05:00 / PITCH / lon = -45Â° / 21.5Â° > lat > 10.0Â°

2020-10-21 GRACE-C IPU reboot (commanded) at 00:10:10 - efahnest

GRACE-D IPU reboot (commanded) at 00:05:30 - efahnest

GRACE-D IPU reboot (spontaneous) at 23:12:10 - efahnest

2020-10-22 GRACE-C IPU reboot (spontaneous) at 23:09:50 - cmccullo

2020-10-23 GPS PRN #2 was disabled in the IPUs from 2020-10-22 11:30 to 2020-10-23 01:00 due an announced period of unavailability.

The commanded reboots near 01:05 were done to resume tracking to all available GPS satellites. - cmccullo

GRACE-D IPU reboot (spontaneous) at 00:34:10 - cmccullo

GRACE-D IPU reboot (commanded) at 01:05:30 - cmccullo

GRACE-C IPU reboot (commanded) at 01:11:20 - cmccullo

2020-10-26 GPS PRN#24 was disabled in the IPUs from 2020-10-26 13:00 to 2020-10-27 02:30 due to an announced period of unavailability. - mpaik

2020-10-27 GRACE-D IPU reboot (commanded) at 02:32:30 - mpaik

GRACE-C IPU reboot (commanded) at 02:38:00 - mpaik

GRACE-D IPU reboot (spontaneous) at 02:46:40 - mpaik

GRACE-C IPU reboot (spontaneous) at 02:57:50 - mpaik

GRACE-C IPU reboot (spontaneous) at 13:48:20 - mpaik

2020-10-28 GPS PRN#27 was disabled in the IPUs from 2020-10-28 12:00 to 2020-10-29 00:00 due to an announced period of unavailability.

GRACE-D A maximal number of tracked GPS satellites was increased to 11 in the IPU at 21:35. - mpaik

2020-10-29 GRACE-D IPU reboot (commanded) at 00:02:30 - efahnest, mpaik

GRACE-C IPU reboot (commanded) at 00:08:00 - efahnest, mpaik

GRACE-C IPU reboot (spontaneous) at 23:34:50 - mpaik

GPS PRN#17 was disabled in the IPUs from 2020-10-29 20:45 to 2020-10-30 10:15 due to an announced period of unavailability - mpaik

2020-10-30 GRACE-D IPU reboot (commanded) at 10:30:30

GRACE-C IPU reboot (commanded) at 10:34:30

GRACE-D IPU reboot (spontaneous) at 23:03:00 - mpaik

GRACE-C KBR MI occurred after 12:34:10. A RestartTracker command sent at 19:17 only temporarily resolved the issue. - mpaik

2020-10-31 GRACE-C IPU soft restart at 20:35:50 - mpaik

2020-11-03 GRACE-D IPU reboot (commanded) at 00:02:30 - cvolk

GRACE-C IPU reboot (commanded) at 00:06:30 - cvolk

The above reboots (on 2020-11-03) were done to resume tracking to all GPS satellites after GPS PRN #6 had been temporarily disabled in the IPUs (starting at 2020-11-02 10:30) due to an announced period of unavailability. - cmccullo

2020-11-04 GRACE-C IPU reboot (spontaneous) at 21:26:20

2020-11-05 GRACE-D IPU reboot (commanded) at 00:45:30

GRACE-C IPU reboot (commanded) at 00:49:30

GRACE-C IPU reboot (spontaneous) at 22:33:50

The early morning IPU reboots (near 2020-11-05 00:45) were done to resume tracking to all GPS satellites after GPS PRN #9 had been temporarily disabled in the IPUs (starting at 2020-11-04 11:10) due to an announced period of unavailability. - cmccullo

2020-11-08 GRACE-D IPU reboot (spontaneous) at 02:18:00

GRACE-C IPU reboot (spontaneous) at 15:54:20 - cmccullo

2020-11-09 GRACE-D IPU reboot (spontaneous) at 19:29:40 - mpaik

GPS PRN#03 was disabled in the IPUs from 2020-11-09 14:15 to 2020-11-10 03:45 due to an announced period of unavailability.

2020-11-10 GRACE-C IPU reboot (commanded) at 03:55:40

GRACE-D IPU reboot (commanded) at 03:50:30 - mpaik

GPS PRN#32 was disabled in the IPUs from 2020-11-10 10:30 to 2020-11-11 00:01 due to an announced period of unavailability.

GPS PRN#11 has been announced unusable until further notice and was disabled in the IPUs at 03:30.

2020-11-11 GRACE-D IPU reboot (commanded) at 03:05:30 - mpaik

GRACE-C IPU reboot (commanded) at 03:09:20

GRACE-C IPU reboot (spontaneous) at 21:55:00 - -mpaik

GRACE-C A Missed Interrupt occurred after the reboot.

2020-11-12 A RestartTracker command sent at 02:45 resolved the issue.

GPS PRN#30 was disabled in the IPUs from 2020-11-12 22:45 to 2020-11-13 12:16 due to an announced period of unavailability. - mpaik

2020-11-13 GRACE-D IPU reboot (commanded) at 12:20:30

GRACE-C IPU reboot (commanded) at 12:30:20

GRACE-D IPU reboot (spontaneous) at 15:33:20 - mpaik

2020-11-16 Thruster calibration tests began today at 6:00 and continued until 25-Nov. During these tests the ACT thrusters were manually triggered for 1sec according to different profiles. - mpaik

GRACE-D IPU reboot (commanded) at 15:48:50 to resume nominal output of all IPU DSP channels - cvolk

GPS PRN#26 will be disabled in the IPUs from 18:00 to 2020-11-17 07:31 due to an announced period of unavailability. - mpaik

2020-11-17 GRACE-D IPU reboot (commanded) at 07:35:40

GRACE-C IPU reboot (commanded) at 07:40:40

GRACE-C IPU reboot (spontaneous) at 08:42:00

GRACE-D IPU reboot (spontaneous) at 21:17:00 - cvolk

GPS PRN #26 was disabled in the IPUs from 2020-11-16 18:00 to 2020-11-17 07:31 due to an announced period of unavailability. The commanded reboots just after 07:35 were done to resume tracking to all GPS satellites. - cmccullo

2020-11-18 GRACE-D IPU reboot (commanded) at 18:50:40 to restore GPS PRN #21

GRACE-C IPU reboot (commanded) at 18:56:40 to restore GPS PRN #21

GPS PRN #21 was disabled in the IPUs from 05:15 to 18:46 due to announced period of unavailability. The commanded reboots around 18:50 were done to resume tracking to all GPS satellites.

2020-11-20 GRACE-C IPU reboot (spontaneous) at 21:53:50 - cmccullo

2020-11-21 GRACE-D IPU reboot (commanded) at 03:10:40

GRACE-C IPU reboot (commanded) at 03:16:50

GRACE-C IPU reboot (spontaneous) at 21:25:30

GPS PRN #08 was disabled in the IPUs from 2020-11-20 11:00 to 2020-11-21 00:31 due to an announced period of unavailability. The commanded reboots around 03:10 were done to resume tracking to all GPS satellites. - cmccullo

2020-11-23 Thruster calibration tests began today at 8:20 and continued until 25-Nov. During these tests the ACT thrusters were manually triggered for 1sec according to different profiles. For the first part of the test the satellite was commanded into NOM-AH mode at 8:10. At 14:40 the nominal NOM_FP mode was restored.

GPS PRN #08 was disabled in the IPUs from 2020-11-23 16:30 to 2020-11-24 06:01 due to an announced period of unavailability. The commanded reboots around 06:10 were done to resume tracking to all GPS satellites. - cmccullo, mpaik

GRACE-C IPU reboot (spontaneous) at 20:36:10

GRACE-D Ongoing thruster calibration tests (23/25-Nov)

2020-11-24 GRACE-D IPU reboot (commanded) at 06:10:40

GRACE-C IPU reboot (commanded) at 06:15:00

GRACE-C IPU reboot (spontaneous) at 13:19:00

GRACE-C IPU reboot (spontaneous) at 14:47:50

GRACE-C A Missed Interrupt occurred after the reboot at 14:47:50. A RestartTracker command sent at 21:17:38 resolved the issue.

GRACE-C IPU reboot (spontaneous) at 22:07:50 - mpaik

2020-11-25 GRACE-C Thruster calibration tests were completed at 10:26.

GRACE-D Thruster calibration tests were completed at 14:26.

LRI high rate diagnostic data was collected during the last part of the thruster calibration tests. The LRI was commanded to diagnostic mode at 08:20 and returned to science mode at 15:11 - mpaik

2020-11-27 GRACE-D IPU reboot (spontaneous) at 06:25:30 - cvolk

2020-11-28 GRACE-C IPU reboot (spontaneous) at 20:30:20 - cvolk

2020-11-29 GRACE-C IPU reboot (spontaneous) at 14:33:40 - cvolk

2020-11-30 GRACE-C IPU reboot (spontaneous) at 14:13:50 - efahnest

GRACE-C A series of missed interrupts occurred after the 14:13 reboot. A Restart tracer command sent at ~03:40 resolved the issue - cvolk

2020-12-01 GRACE-C RestartTracker command sent at 03:44 to resolve missed interrupt - cvolk

2020-12-02 GRACE-D IPU reboot (spontaneous) at 13:08:40 - cvolk

GRACE-C IPU reboot (commanded) at 14:49:00 to re-enable PRN #14 and increase number of GPS tracked satellites to 11 - cvolk

GRACE-C IPU reboot (spontaneous) at 20:37:40 - cvolk

2020-12-06 GRACE-D IPU reboot (spontaneous) at 07:14:20 - mpaik

2020-12-07 The sampling rate of a housekeeping telemetry packet SPID14002 was increased from once per 32 sec to 4 sec to support the data analysis for GRACE-C at 14:30 andfor GRACE-D at 03:05. - mpaik

2020-12-09 GRACE-D IPU reboot (commanded) at 12:11:20 (to resume nominal output of DSP channel #25 - the channel was stuck) - mpaik

Four LRI reboots were commanded (11:45-11:54) in order to validate all four flight software images.

2020-12-10 GRACE-C A new TC to enable autonomous on-board Missed Interrupt Handling was uplinked to the IPU at 11:47. - mpaik

2020-12-15 GRACE-C The sampling rate of a housekeeping telemetry packet SPID14001 was increased to 1 sec. - mpaik

GRACE-C IPU reboot (spontaneous) at 08:30:20 - cvolk, mpaik

2020-12-18 GRACE-C The sampling rate of a housekeeping telemetry packet SPID14002 was set to 4 sec. - mpaik

2020-12-19 GRACE-C IPU reboot (spontaneous) at 08:54:10 - cvolk

2020-12-21 GRACE-D IPU reboot (commanded to resume nominal output on all channels - a channel was stuck) at 10:57:10 - cmccullo

2020-12-23 GRACE-C IPU reboot (spontaneous) at 04:57:40 - cmccullo

2020-12-24 GRACE-C IPU reboot (spontaneous) at 10:13:50 - cmccullo

2020-12-25 GRACE-D IPU reboot (spontaneous) at 09:45:20

GRACE-C IPU reboot (spontaneous) at 09:47:10 - cmccullo, efahnest

2020-12-26 GRACE-C IPU reboot (spontaneous) at 06:16:20

GRACE-C IPU reboot (spontaneous) at 09:28:30 - cmccullo, efahnest

2020-12-27 GRACE-C STR-A reboot at 17:03 - mpaik

2020-12-28 GRACE-C IPU reboot (commanded) at 15:20:00

GRACE-D IPU reboot (commanded) at 16:48:10 - mpaik

GPS PRN#07 was announced usable again and was enabled in the IPUs at 15:15 (GF1) and 16:50 (GF2). Afterwards, the IPUs was restarted in order to resume tracking to all available GPS satellites.

GRACE-C In order to support the analysis of ACC data:

At 01:04 the sample rate of TM packet 14002 was increased from 4sec to 1sec.

At 01:14 the LRI was commanded to the Diagnostic Mode.

LRI high rate diagnostic data were being collected once per orbit. - mpaik

2020-12-29 GRACE-C At 00:03 LRI was commanded to the Auto Acquisition/Science Mode and the sample rate of TM packet 14002 was set back to 4sec. - mpaik

2021-01-01 GRACE-C LRI diagnostic data collection started on 01-Jan and ended on 11-Jan. During this periond the LRI is commanded to the Diagnostic Mode and high rate data is collected daily for two orbits. For the data collection time, the sampling rate of TM packet 14002 is increased from 4sec to 1sec. - mpaik

GRACE-D Possible micrometeoroid impact at 15:26:37. There are notable signatures in all 6 accelerometer axes and a spike in the LRI data (as confirmed by Vitali). Note that this impact appears to be quite small. - cmccullo

2021-01-04 GRACE-D Possible micrometeoroid impact at 12:48:59. There are notable signatures in all 6 accelerometer axes and a spike in the LRI data (as confirmed by Vitali). Note that this impact appears to be quite small. - cmccullo

2021-01-08 GRACE-D Anomalous behavior of the LRI during sun blindings necessitated some special handling of the LRI data. - cmccullo

2021-01-09 GRACE-D Anomalous behavior of the LRI during sun blindings necessitated some special handling of the LRI data.

Note that the span from 10:08 to 10:18, may have a suspect time bias value (this data may have to be edited at Level-2). - cmccullo

2021-01-11 GRACE-C The last part of the LRI diagnostic data collection (01/11-Jan) was finished at 12:31. - mpaik

GRACE-D The IPU PPS time incorrectly jumped by 1024 sec (similar to the time jump on 18-Jan-2020). Thanks to the modified FDIR response to such an event the on-board time synchronization to GPS was disabled and the satellite maintained the NOM-FP mode. As a result of the time jump, the IPU was unable to acquire new GPS satellites and it rebooted at 16:48 (south-east Indian Ocean). A short time later, it rebooted again at 17:03 (Laos).

GRACE-D IPU reboot (spontaneous) at 16:48:50

GRACE-D IPU reboot (spontaneous) at 17:04:00 - mpaik

2021-01-12 GRACE-D The on-board time synchronization to GPS was re-enabled at 09:16. - mpaik

2021-01-22 GRACE-D IPU reboot (commanded) at 03:45:40

GRACE-C IPU reboot (commanded) at 03:49:40 - cvolk

2021-01-23 GRACE-C IPU reboot (spontaneous) at 04:02:30 - cvolk

2021-01-31 GRACE-C IPU reboot (spontaneous) at 04:27:10 - cvolk

2021-02-05 GRACE-D IPU reboot (commanded) at 07:35:20

GRACE-C IPU reboot (commanded) at 07:41:10 - cvolk

GRACE-C At 23:45:10, Ka/K Trackers restarted autonomously after a Missed Interrupt was detected on-board. - mpaik

GPS PRN#08 was disabled in the IPUs from 2021-02-04 18:00 to 2021-02-05 07:35 due to an announced period of unavailability. The IPUs on both satellites were restarted at 07:35 (South Pacific Ocean).

2021-02-14 GRACE-C IPU reboot (spontaneous) at 13:26:20 - efahnest

2021-02-19 GRACE-C IPU reboot (commanded) at 09:14:40

GRACE-D IPU reboot (commanded) at 09:10:40

IPU reboots were commanded to ensure tracking was renabled to all available satellites after GPS PRN#12 was disabled in the IPUs (2021-02-18 19:35 to 2021-02-19 09:05) due to an announced period of unavailability - cmccullo

GRACE-C IPU reboot (spontaneous) at 23:54:20 - cmccullo

2021-02-23 GRACE-D The IPU S/W was restarted at 13:23 (Drake Passage/OHG) in order to resume the nominal output of DSP channels 27, 28 and 29. - mpaik

GRACE-D IPU reboot (commanded) at 13:23:10

GRACE-C IPU reboot (spontaneous) at 15:40:30 - mpaik

2021-02-26 GPS PRN#04 was disabled in the IPUs from 2021-02-25 10:30 to 2021-02-26 00:00 due to an announced period of unavailability. - mpaik

GRACE-D IPU reboot (commanded) at 03:05:40

GRACE-C IPU reboot (commanded) at 03:09:30

2021-02-27 GRACE-C GPS PRN#18 was disabled in the IPU from 2021-02-26 08:35 to 2021-02-27 04:01.

GRACE-D GPS PRN#18 was disabled in the IPU from 2021-02-06 16:00 to 2021-02-27 04:01. - mpaik

GRACE-D IPU reboot (commanded) at 04:05:40

GRACE-C IPU reboot (commanded) at 04:09:30 - mpaik

2021-03-02 GPS PRN #04 disabled from 10:30 to 2021-03-03 00:00, IPUs to be rebooted at 2021-03-03 03:05 - cvolk

2021-03-03 GRACE-D IPU reboot (commanded) at 03:05:40 to reenable GSP PRN #04 - cvolk

GRACE-C IPU reboot (commanded) at 03:16:30 to reenable GSP PRN #04 - cvolk

GRACE-C IPU reboot (spontaneous) at 14:20:10 - cvolk

GRACE-C Yaw thruster test was performed from 05:27 to 07:55. The test was divided into four sequences with 20 x 50ms long thruster firings. The firings occurred every 10 seconds.

Sequence start times:

05:27:20 branch A Y+ thruster

06:14:20 branch A Y- thruster

07:01:20 branch B Y+ thruster

07:49:20 branch B Y- thruster

GRACE-C LRI diagnostic data was collected during the thruster test. The LRI was commanded to diagnostic mode at 05:27 and returned to science mode at 08:37. - cmccullo

2021-03-09 GRACE-D A spontaneous reboot of the LRI was experienced at 12:23 (over the Arctic Ocean).

GRACE-C LRI: short period in Reacquisition Mode due to LRI reboot on GF2. - mpaik

2021-03-11 GRACE-C IMU-4 was switched on from 09:55 to 11:30.

GRACE-D IMU-4 was switched on from 11:30 to 13:05. - mpaik

2021-03-12 GPS PRN#20 was disabled in the IPUs from 2021-02-12 02:45 to 2021-03-13 16:16 due to an announced period of unavailability. - mpaik

GRACE-D IPU reboot (commanded) at 16:20:40

GRACE-C IPU reboot (commanded) at 16:27:30 - mpaik

2021-03-14 GRACE-D IPU reboot (spontaneous) at 21:48:00 - cvolk

2021-03-18 GPS PRN#24 was disabled in the IPUs from 2021-03-18 16:45 to 2021-03-19 06:16 due to an announced period of unavailability. - cvolk

2021-03-19 GRACE-D IPU reboot (commanded) at 06:20:40

GRACE-C IPU reboot (commanded) at 06:25:00 - cvolk

2021-03-20 GRACE-C possible micrometeoroid impact at 04:23:33 (delta-v of 0.476 microns/sec)

2021-03-22 GRACE-C Ongoing IPU S/W upload:

At 09:50 the maximal number of tracked GPS satellites was set to 10.

At 09:51 radio occultation measurements were disabled.

At 13:56 ClearFlashFile library was uploaded and installed (it will be activated at the next IPU restart, after all scheduled libraries have been installed).

2021-03-23 GRACE-C Ongoing IPU S/W upload:

At 12:00 TrackNPack library was uploaded and installed (it will be activated at the next IPU restart, after all scheduled libraries have been installed).

GRACE-D IPU reboot (spontaneous) at 22:46:40 - mpaik

GRACE-D possible micrometeoroid impact at 22:10:26 (delta-v of -0.183 microns/sec)

2021-03-24 GRACE-C IPU S/W was successfully updated to version V4.4:

At 10:01 TriG_MCP and GFODefaults libraries were installed.

At 11:50 FlashFile library was installed

At 12:23 the IPU was restarted and the new S/W was activated (over McMurdo/Antarctica).

At 12:25 the maximal number of tracked GPS satellites was set to 11.

IPU reboot (spontaneous) at 12:27:40 - mpaik, efahnest

GSOC uploaded V4.4/V4.3 flight software to GF1. - mpaik

2021-03-26 GRACE-C Radio occultation measurements were enabled at 17:00.

2021-03-29 GRACE-C CMCal maneuvers were executed yesterday and today:

Pitch: 20:50, 05:08, 06:43

Roll: 01:59, 03:34

Yaw: 23:04, 00:38

GRACE-D CMCal maneuvers were executed today:

Pitch: 04:57, 06:31, 08:32

Roll: 01:48, 03:22

Yaw: 11:01, 12:36

2021-04-01 GRACE-D IPU reboot (spontaneous) at 12:23:10

2021-04-02 GRACE-D IPU reboot (commanded) at 03:05:40

GRACE-C IPU reboot (commanded) at 03:09:50 - cvolk

These reboots were to re-enable PRN #9 on both IPUs

2021-04-06 GRACE-D IPU reboot (spontaneous) at 02:29:48 - mpaik

2021-04-09 GPS PRN#28 was disabled in the IPUs from 2021-04-08 15:15 to 2021-04-09 04:46 today due to an announced period of unavailability.

GRACE-D IPU reboot (commanded) at 04:50:40

GRACE-C IPU reboot (commanded) at 04:54:30

2021-04-12 GPS PRN#24 was disabled in the IPUs at 14:15.

2021-04-14 GRACE-D IPU reboot (spontaneous) at 20:52:50

2021-04-18 GRACE-D IPU reboot (spontaneous) at 20:58:10 - efahnest

2021-04-20 GRACE-D IPU reboot (spontaneous) at 10:15:10 - mpaik

2021-04-22 GPS PRN#07 was disabled in the IPUs from 10:00 to 23:31 due to an announced period of unavailability - mpaik

2021-04-23 GRACE-D IPU reboot (commanded) at 03:05:40

GRACE-C IPU reboot (commanded) at 03:10:20 - mpaik

2021-04-26 GRACE-D IPU reboot (commanded) at 15:50:40

GRACE-C IPU reboot (commanded) at 15:54:30 - efahnest

GPS PRN#24 was re-enabled in the IPUs at 15:46, disabled since 2021-04-12 14:15 - cvolk

2021-05-05 GRACE-D Due to incorrect GPS solution satellite attitude was unstable for 20 sec at 22:07. - mpaik

Due to attitude anomaly on GF2, LRI dropped to re-acquisition mode for ca. 2min at 22:07.

2021-05-06 GPS PRN#26 was disabled in the IPUs (01:10 through 14:41) due to an announced period of unavailability.

GRACE-D IPU reboot (commanded) at 14:45:40

GRACE-C IPU reboot (commanded) at 14:50:00 - mpaik

2021-05-20 GPS PRN#28 was disabled in the IPUs at 11:03 due to an announced period of unavailability.

2021-05-21 GRACE-C A new TC to clear GPS Almanac (NMWI_6399) was at 00:34. RI-1742 was executed following the new flight rule to Clear Predict Almanac instead of a

command soft restart on GF1 after the schedule PRN 28 outage, but unfortunately, GF1 IPU still was not able to reacquire PRN 28.

GRACE-D IPU reboot (spontaneous) at 03:05:40, GPS PRN#28 was enabled in the IPU - mpaik

2021-05-26 GRACE-C IPU reboot (commanded) at 21:04:50, reboot was commanded because PRN#28 never reacquired after 2021-05-21 reboot

2021-05-27 GRACE-D IPU reboot (spontaneous) at 18:40:30 - cvolk

GPS PRN #22 was disabled at 2021-05-27 23:15 due to an announced period of unavailability - cvolk

2021-05-28 GRACE-D IPU reboot (commanded) at 12:50:40 to enable GPS PRN #22 - cvolk

GRACE-C IPU reboot (commanded) at 17:34:30 to enable GPS PRN #22 - cvolk

K/Ka band trackers restarted autonomously by the onboard MI monitor at approximately 18:13 - cmccullo

GRACE-D The IPU DSP channels 21, 22 and 23 have not been outputting data since around 15:44 UTC - mpaik

2021-05-31 GRACE-C K/Ka band trackers restarted autonomously by the onboard MI monitor at approximately 04:38 - cmccullo

GRACE-D IPU reboot (commanded) at 17:35:30 - efahnest

GRACE-D IPU reboot (spontaneous) at 17:49:40 - efahnest

The channels 21, 22, and 23 were recovered around 17:55 UTC - mpaik

2021-06-01 The satellites were transitioned from relative pointing to nadir pointing at 152/00:00. They will continue nadir pointing for the next two days in order to

help characterize the difference in drag between GF1 and GF2. These nadir pointing characterizations will occur two days per week over the next month or so.

LRI mirror scanning is disabled during the two day characterization. - mpaik

2021-06-03 The satellites were transitioned back to relative pointing at 154/00:00.

Mirror scanning was re-enabled in the LRIs five minutes later and a warm restart was commanded. The LRIs failed to reacquire and enter science mode.

They remain in reacquisition mode. - mpaik

2021-06-04 LRI switched to Diagnostic Mode at 00:17 after being in Re-Acquisition Mode for 24 hours. - mpaik

2021-06-06 LRIs were restarted at 23:57, but remain in diagnostic mode. - cvolk

2021-06-07 Satellites were transitioned from relative pointing to nadir pointing at 00:00 - cvolk

2021-06-09 The satellites were transitioned back to relative pointing at 00:00 - cvolk

The LRIs were both restarted at 00:15, and entered science mode at 00:19

New LRI parameter file and frequency updated at 16:10, then restarted at 16:24

LRI reacquired at 16:28 after the parameter update

GRACE-D KBR Missed Interrupt occurred at 21:20

2021-06-10 GRACE-D KBR restart tracker command was sent at 04:15 - cvolk

GPS PRN #31 will be disabled from 18:15 to 07:46 - cvolk

2021-06-11 GRACE-D IPU reboot (commanded) at 07:50:40 to re-enable PRN #31- cvolk

GRACE-C IPU reboot (commanded) at 07:55:40 to re-enable PRN #31- cvolk

2021-06-13 The LRIs on both satellites were restarted to Diagnostic Mode at 23:57. - mpaik

GRACE-D Possible micrometeoroid impact at 19:09:10 (delta-v of approximately -0.116 microns/sec). - cmccullo

2021-06-14 The satellites were transitioned from relative pointing to nadir pointing at 00:00. - mpaik

2021-06-16 The satellites were transitioned back to relative pointing at 00:00. The LRIs on both satellites were restarted at 00:15 and entered Science Mode. - mpaik

2021-06-17 GRACE-D IPU reboot (commanded) at 17:03:50 - mpaik

2021-06-20 GRACE-C GPS PRN #28 disabled at 13:23 - cvolk

The LRIs were both restarted to diagnostic mode at 23:57

2021-06-21 The satellites were transitioned from relative pointing to nadir pointing at 00:00 - cvolk

GRACE-D LRI was changed to master to check the status of the LRI cavity

GRACE-D GPS PRN #28 disabled at 01:47 - cvolk

GRACE-D autonomous KBR Missed Interrupt Handling was enabled at 14:35

2021-06-23 The satellites were transitioned from nadir pointing to relative pointing at 00:00 - cvolk

GRACE-D LRI was changed to transponder role at 00:15 and restarted

LRI mirror scanning was not enabled as expected at 00:05, and wasn't enabled until 13:53

LRI entered Science Mode at 13:54

GRACE-D IPU reboot (spontaneous) at 15:41:10 - cvolk

2021-06-26 GRACE-C Possible micrometeoroid impact at 11:57:29 (delta-v of approximately 0.095 microns/sec).

GRACE-D Possible micrometeoroid impact at 06:33:35 (delta-v of approximately 0.112 microns/sec).

Possible micrometeoroid impact at 14:47:39 (delta-v of approximately -0.403 microns/sec). - cmccullo

2021-06-27 GRACE-D The LRI was set to master role and restarted at 23:55 - mpaik

The LRI was commanded to Diagnostic Mode at 23:59:30

2021-06-28 The satellites were transitioned from relative pointing to nadir pointing at 00:00. - mpaik

LRI diagnostic tests were performed on both satellites:

- cavity scan was performed at 01:00 and the LRI was restarted at 01:38.

- PMH temperature scan was performed at 03:00 and the LRI was restarted at 08:13.

LRI remains in Diagnostic Mode.

2021-06-30 GRACE-C The LRI was commanded to Reacquisition Mode at 00:06.

GRACE-D The LRI was set to Transponder role at 00:15 and restarted to Reacquisition Mode.

GRACE-D DSP channels 36, 37, and 38 stopped outputting data at approximately 2021-06-30 13:30 - cvolk

The satellites were transitioned back to relative pointing at 00:00. LRI entered Science Mode at 00:19. - mpaik

2021-07-01 GRACE-C Possible micrometeoroid impact at 11:36:30 (delta-v of approximately -0.307 microns/sec). - cmccullo

2021-07-04 The LRIs were restarted to Diagnostic Mode at 23:57 - cvolk

2021-07-05 Both satellites were transitioned from relative pointing to nadir pointing at 00:00 - cvolk

2021-07-06 GRACE-D IPU reboot (commanded) at 09:39:00 to re-enable DSP channels 36, 37, and 38 - cvolk

2021-07-07 The satellites were transitioned back to relative pointing at 00:00. LRIs entered Science Mode at 00:08. - cvolk

GRACE-D IPU reboot (spontaneous) at 16:33:50 - cvolk

2021-07-08 GRACE-D IPU reboot (spontaneous) at 03:23:30 - cvolk

GRACE-D IPU autonomous MI event detected and trackers restarted at 03:37:52 - cvolk

2021-07-09 GPS PRN #06 is disabled in the IPUs from 04:15 to 17:46 - cvolk

GRACE-D IPU reboot (commanded) at 17:50:40 to re-enable PRN #06 - cvolk

GRACE-C IPU reboot (commanded) at 17:56:10 to re-enable PRN #06 - cvolk

2021-07-11 The LRIs on both satellites were restarted to Diagnostic Mode at 23:57. - mpaik

2021-07-12 The satellites were transitioned from relative pointing to nadir pointing at 00:00. - mpaik

GRACE-D IPU reboot (spontaneous) at 02:41:40 - mpaik

2021-07-14 The satellites were transitioned back to relative pointing at 00:00.

LRI low CNR test started on both satellites.

- At 00:10 a low CNR parameter file was installed

- At 00:13 LRI was restarted and re-acquired the link at 00:17

GRACE-D IPU reboot (spontaneous) at 13:02:20 - mpaik

2021-07-15 Ongoing LRI low CNR test.

2021-07-16 GRACE-D IPU reboot (commanded) at 03:20:40

GRACE-C IPU reboot (commanded) at 03:30:50 - mpaik

GPS PRN#06 was enabled in the IPUs at 03:16 due to an announced period of unavailability.

The LRI low CNR test was completed at 04:00: the nominal parameter files were restored and the LRIs restarted to Science Mode. - mpaik

2021-07-18 GRACE-D Possible micrometeoroid impact at 04:40:38 (delta-v of approximately 0.419 microns/sec). - cmccullo

2021-07-19 GRACE-D undergoing IPU S/W upload starting at 08:20 - cvolk

GRACE-D IPU reboot (commanded) at 08:20:40 - mpaik

2021-07-20 GRACE-D Possible micrometeoroid impact at 05:30:58 (delta-v of approximately 0.149 microns/sec). - cmccullo

2021-07-21 GRACE-D IPU reboot (commanded) at 12:58 to enable new IPU software - cvolk

GSOC has completed V4.4/V4.3 software upload to GF2 IPU, so we now have the same flight software running on both GF1 and GF2. - mpaik

GRACE-D max number of GPS satellites set to 11 at 13:01 - cvolk

2021-07-22 GRACE-D IPU reboot (spontaneous) at 13:03:00 - cvolk, efahnest

GPS PRN #05 disabled from 15:00 to 2021-07-23 04:31 due to an announced period of unavailability - cvolk

2021-07-23 GRACE-C IPU reboot (commanded) at 04:39:10 to re-enable GPS PRN #05 - cvolk, efahnest

GRACE-D IPU reboot (commanded) at 04:39:10 to re-enable GPS PRN #05 - cvolk, efahnest

Possible micrometeoroid impact at 04:24:57 (delta-v of approximately -0.185 microns/sec). - cmccullo

2021-07-25 The LRIs on both satellites were restarted to Diagnostic Mode at 23:57. - mpaik

2021-07-26 The satellites were transitioned from relative pointing to nadir pointing at 00:00. - mpaik

2021-07-28 The satellites were transitioned back to relative pointing at 00:00.

LRIs on both were commanded to Reacquisition Mode at 00:06 and entered Science Mode at 00:08. - mpaik

2021-07-30 GRACE-D IPU reboot (commanded) at 18:24:30

GRACE-C IPU reboot (commanded) at 18:25:10 - mpaik

2021-07-31 GPS PRN#14 was disabled in the IPUs (04:45 - 18:16) due to an announced period of unavailability. - mpaik

2021-08-01 LRIs were restarted to Diagnostic mode at 23:59 - cvolk

2021-08-02 The satellites were transitioned from relative pointing to nadir pointing at 00:00. - cvolk

2021-08-04 The satellites were transitioned back to relative pointing at 00:00. - cvolk

LRIs on both were commanded to Reacquisition Mode at 00:05 and entered Science Mode at 00:08. - cvolk

2021-08-06 GPS PRN#03 was disabled in the IPUs (00:15 - 13:46) due to an announced period of unavailability. - cvolk

GRACE-D IPU reboot (commanded) at 13:59:30 - cvolk

GRACE-C IPU reboot (commanded) at 13:59:40 - cvolk

2021-08-08 The LRIs on both satellites were restarted to Diagnostic Mode at 23:59. - mpaik

2021-08-09 The satellites were transitioned from relative pointing to nadir pointing at 00:00. - mpaik

2021-08-11 The satellites were transitioned back to relative pointing at 00:00.

LRIs on both satellites were commanded to Reacquisition Mode at 00:05 and entered Science Mode shortly thereafter. - mpaik

GRACE-C Possible micrometeoroid impact at 16:23:58 (delta-v of approximately 0.057 microns/sec in LOS). - cmccullo

2021-08-15 The LRIs on both satellites were restarted to Diagnostic Mode at 23:59. - cvolk

2021-08-16 The satellites were transitioned from relative pointing to nadir pointing at 00:00. - cvolk

GRACE-D IPU reboot (spontaneous) at 03:48:20 - cvolk

2021-08-18 The satellites were transitioned back to relative pointing at 00:00.

LRIs on both satellites were commanded to Reacquisition Mode at 00:05 and entered Science Mode shortly thereafter. - cvolk

2021-08-20 GRACE-D At 07:28 an autonomous STRE switch-over A to B occurred. - cvolk

At 11:31 the first recovery steps were executed from ground: - cvolk

all MTL SSIDs except 7* was enabled

aberration correction for STRE-B was enabled

2021-08-23 GRACE-D MTL SSID (Mission Timeline Sub-Schedule ID) 7 was enabled at 17:35. - mpaik

2021-08-26 GRACE-D STRE was successfully switched back from branch B to A at 13:15. - mpaik

2021-08-29 The LRIs on both satellites were restarted to Diagnostic Mode at 23:59. - cvolk

2021-08-30 The satellites were transitioned from relative pointing to nadir pointing at 00:00. - cvolk

2021-09-01 The satellites were transitioned back to relative pointing at 00:00.

LRIs on both satellites were commanded to Reacquisition Mode at 00:05 and entered Science Mode shortly thereafter. - cvolk

L2C Radio Occultations enabled for PRN 13 and 23 at 21:05 - cvolk

2021-09-05 Center-of-Mass Calibrations (CMCal) were performed on both satellites in NOM-AH. - mpaik

Due to sun blinding on each satellite one Star Tracker head was disabled in the AOCS processing for the CMCal maneuvers.

GRACE-C The satellite was in NOM-AH mode from 20:36 2021-09-05 to 11:20 2021-09-06.

At 20:45 STR3 was disabled in the AOCS processing.

CMCal maneuvers were executed from 2021-09-05 to 2021-09-06:

Pitch: 20:54, 05:55, 07:33

Roll: 02:46, 04:20

Yaw: 09:30, 11:05

At 11:15 STR3 was enabled in the AOCS processing.

GRACE-D The satellite was in NOM-AH mode from 21:31 2021-09-05 to 11:05 2021-09-06.

At 21:40 2021-09-05 STR2 was disabled in the AOCS processing.

CMCal maneuvers were executed from 2021-09-05 to 2021-09-06:

Pitch: 06:07, 07:42, 08:51

Roll: 02:57, 04:33,

Yaw: 21:49, 23:24

At 09:00 STR2 was enabled in the AOCS processing.

2021-09-11 Flex power was on globally from 9-11 to 9-15. Before we saw some changes in POD stats (minor effects), probably will again. - willy, mpaik

2021-09-12 The LRIs on both satellites were restarted to Diagnostic Mode at 23:59. - cvolk

2021-09-13 The satellites were transitioned from relative pointing to nadir pointing at 00:00. - cvolk

2021-09-15 The satellites were transitioned back to relative pointing at 00:00.

LRIs on both satellites were commanded to Reacquisition Mode at 00:05 and entered Science Mode shortly thereafter. - cvolk

2021-09-24 GPS PRN#25 was disabled in the IPUs (01:45 - 15:16) due to an announced period of unavailability. - mpaik

GRACE-C IPU reboot (commanded) at 15:22:40.0000 - efahnest

GRACE-D IPU reboot (commanded) at 15:23:30.0000 - efahnest

2021-09-26 The LRIs on both satellites were restarted to Diagnostic Mode at 23:59. - efahnest

2021-09-27 The satellites were transitioned from relative pointing to nadir pointing at 00:00. - efahnest

2021-09-29 The satellites were transitioned back to relative pointing at 00:00.

LRIs on both satellites were commanded to Reacquisition Mode at 00:05 and entered Science Mode shortly thereafter. - cvolk

2021-10-19 GRACE-C Possible micrometeoroid impact at 19:27:36 (delta-v of approximately 0.127 microns/sec). - cmccullo

2021-10-20 GRACE-C IPU reboot (spontaneous) at 14:29:50 - mpaik

GRACE-D At 15:10 the settings of radio occultation measurements were modified to:

azimuth: 55 deg

start altitude: 125 km

OL to EL transition: -15 km

end altitude: -180 km

2021-10-23 GRACE-D Possible micrometeoroid impact at 18:17:53 (delta-v of approximately -0.131 microns/sec). - cmccullo

2021-10-26 GRACE-D Possible micrometeoroid impact at 12:24:26 (delta-v of approximately -0.209 microns/sec). - cmccullo

2021-10-27 GPS PRN#03 was disabled in the IPUs at 13:30 due to an announced period of unavailability. It will be enabled again on 10-Nov. -cvolk

2021-10-30 LRIs were restarted to Diagnostic Mode at 23:59.

2021-10-31 The satellites were in nadir-pointing from 31-Oct 00:00 through 02-Nov 00:00.

For the period in relative pointing the LRIs on both satellites were commanded to Diagnostic Mode:

2021-11-02 LRIs were commanded to Reacquisition Mode at 00:05 and entered Science Mode shortly thereafter. - mpaik

2021-11-03 GRACE-C IPU reboot (commanded) at 03:04:20 - mpaik

GRACE-D IPU reboot (commanded) at 03:05:00

An orbit raise maneuver was performed on both satellites.

Before the maneuver inter-satellite measurements were stopped:

At 02:53 IPUs were restarted and K/Ka trackers were disabled.

At 03:28 LRIs were commanded to Diagnostic Mode.

after the correction maneuver on GF1 the inter-satellite measurements was resumed:

At 17:35 the IPUs were restarted to Normal Mode with K/Ka trackers enabled.

At 17:40 LRIs were commanded to Re-acquisition Mode.

GRACE-C At 03:32 the satellite was transitioned to nadir pointing.

At 03:33 a yaw turn-around maneuver was performed (in NOM-ACQ).

At 04:08 the orbit raise maneuver was performed: OC thrusters were activated for 29min50sec (in OCM).

At 16:18:45 the orbit correction maneuver was executed: OC thrusters was activated for 31sec (in OCM).

At 16:22:46 a yaw turn-around maneuver was performed (in NOM-ACQ).

At 16:54:16 the satellite was set back to relative pointing.

GRACE-D At 03:58:30 the satellite was transitioned to nadir pointing.

At 04:02:30 the orbit raise maneuver was performed: OC thrusters were activated for 29min50sec (in OCM)

At 17:30 the satellite was set back to relative pointing.

GRACE-C IPU reboot (commanded) at 17:39:40 - mpaik

GRACE-D IPU reboot (commanded) at 17:39:50

2021-11-09 GPS PRN#03 was announced usable again and will enabled in the IPUs.

GRACE-C IPU reboot (commanded) at 12:42:00 - efahnest

GRACE-D IPU reboot (commanded) at 17:56:50 - efahnest

2021-11-10 GRACE-D Possible micrometeoroid impact at 12:45:28 (delta-v of approximately -0.109 microns/sec). - cmccullo

2021-11-11 GRACE-C Possible micrometeoroid impact at 19:12:27 (delta-v of approximately 0.262 microns/sec). - cmccullo

2021-11-12 GRACE-C Possible micrometeoroid impact at 02:47:13 (delta-v of approximately 0.122 microns/sec). - cmccullo

2021-11-16 GRACE-D Possible micrometeoroid impact at 13:45:53 (delta-v of approximately -0.089 microns/sec). - cmccullo

2021-11-15 GPS PRN#16 was disabled in the IPUs from 18:45 2021-11-15 through 08:16 2021-11-16 due to an announced period of unavailability. - mpaik

2021-11-16 The IPUs on both satellites were restarted at 08:20 (North Pole) in order to resume tracking to all available GPS satellites. - mpaik

GRACE-C IPU reboot (commanded) at 08:25:00

GRACE-D IPU reboot (commanded) at 08:25:40

2021-11-20 GRACE-D Possible micrometeoroid impact at 12:19:03 (delta-v of approximately -0.077 microns/sec). - cmccullo

GRACE-D Possible micrometeoroid impact at 12:20:47 (delta-v of approximately -0.072 microns/sec). - cmccullo

2021-11-22 GRACE-D Possible micrometeoroid impact at 14:47:21 (delta-v of approximately -0.116 microns/sec). - cmccullo

2021-11-23 GRACE-C IPU reboot (spontaneous) at 22:19:30 - cvolk

2021-11-26 GRACE-D Possible micrometeoroid impact at 11:45:07 (delta-v of approximately -0.352 microns/sec). - cmccullo

2021-11-29 LRI diagnostic data were collected during sun-blinding phase. The LRIs were in Diagnostic Mode during these scans. - mpaik

GRACE-C LRI diagnostic data were collected on 2021-11-29:

from 20:13 through 20:58

from 21:48 through 22:33

2021-11-30 GRACE-D LRI diagnostic data were collected on 2021-11-30:

from 00:10 through 00:55

from 01:44 through 02:29

2021-12-02 GRACE-D Possible micrometeoroid impact at 14:17:37 (delta-v of approximately -0.228 microns/sec). - cmccullo

2021-12-03 GPS PRN#29 was disabled in the IPUs (01:30 - 15:01) due to an announced period of unavailability. - mpaik

GRACE-C IPU reboot (commanded) at 15:10:00

GRACE-D IPU reboot (commanded) at 15:10:00

2021-12-08 GRACE-C GPS PRN#22 was disabled in the IPUs (09:50) due to an announced period of unavailability. - cvolk

GRACE-D GPS PRN#22 was disabled in the IPUs (11:30) due to an announced period of unavailability.

2021-12-09 GPS PRN#02 was disabled in the IPUs (11:15 - 00:46) due to an announced period of unavailability. - cvolk

GRACE-D Possible micrometeoroid impact at 13:16:30 (delta-v of approximately -0.143 microns/sec). - cmccullo

2021-12-10 The IPUs on both satellites were restarted at ~03:10 in order to resume tracking to all available GPS satellites. - cvolk

GRACE-D IPU reboot (commanded) at 03:10:00

GRACE-C IPU reboot (commanded) at 03:16:20

GRACE-D Possible micrometeoroid impact at 09:48:36 (delta-v of approximately -0.2 microns/sec). - cmccullo

2021-12-11 GRACE-D Possible micrometeoroid impact at 01:50:41 (delta-v of approximately -0.139 microns/sec). - cmccullo

2021-12-15 GPS PRN 27 was disabled in the IPUs at 17:30* due to an announced period of unavailability. - mpaik

2021-12-19 The LRIs on both satellites were restarted to Diagnostic Mode at 23:59. - cmccullo

2021-12-20 The satellites were transitioned from relative pointing to nadir pointing at 00:00. - cmccullo

2021-12-22 The satellites were transitioned back to relative pointing at 00:00.

The LRIs on both satellites were commanded to Reacquisition Mode at 00:05 and entered Science Mode shortly thereafter. - cmccullo

2021-12-25 GRACE-C Possible micrometeoroid impact at 01:56:43 (delta-v of approximately 0.297 microns/sec). - cmccullo

GRACE-C Possible micrometeoroid impact at 20:55:14 (delta-v of approximately 0.140 microns/sec). - cmccullo

2021-12-26 The LRIs on both satellites were restarted to Diagnostic Mode at 23:59.

GRACE-C Possible micrometeoroid impact at 20:29:08 (delta-v of approximately 0.127 microns/sec). - cmccullo

2021-12-27 The satellites were transitioned from relative pointing to nadir pointing at 00:00. - mpaik

2021-12-28 GRACE-D IPU reboot (spontaneous) at 07:23:00 - mpaik

2021-12-29 The satellites were transitioned back to relative pointing at 00:00.

LRIs on both satellites were commanded to Reacquisition Mode at 00:05 and entered Science Mode shortly thereafter.

GPS PRN#27 was enabled in the IPUs at 19:01. Afterwards, the IPUs was restarted at 19:05 (Red Sea/Saudi Arabia). - mpaik

GRACE-C IPU reboot (commanded) at 19:10:10

GRACE-D IPU reboot (commanded) at 19:10:10

GRACE-C Possible micrometeoroid impact at 17:48:48 (delta-v of approximately 0.209 microns/sec). - cmccullo

2021-12-30 GRACE-C IPU reboot (spontaneous) at 01:14:30 - mpaik

GRACE-C Possible micrometeoroid impact at 14:22:40 (delta-v of approximately 0.056 microns/sec). - cmccullo

2021-12-31 GRACE-C Possible micrometeoroid impact at 05:41:32 (delta-v of approximately 0.059 microns/sec). - cmccullo

2022-01-01 GRACE-C Possible micrometeoroid impact at 15:12:41 (delta-v of approximately 0.063 microns/sec). - cmccullo

2022-01-02 The LRIs on both satellites were restarted to Diagnostic Mode at 23:59. - cvolk

2022-01-03 The satellites were transitioned from relative pointing to nadir pointing at 00:00. - cvolk

2022-01-04 Four LRI reboots were commanded (00:45-00:54) in order to validate all four flight software images. - cvolk

GRACE-C IPU reboot (commanded) at 20:12:30 (Adriatic Sea) in order to resume tracking to all available GPS satellites. - efahnest

2022-01-05 The satellites were transitioned back to relative pointing at 00:00 today.

LRIs on both satellites were commanded to Reacquisition Mode at 00:05 and entered Science Mode shortly thereafter.

2022-01-09 The LRIs on both satellites were restarted to Diagnostic Mode at 23:59. - mpaik

2022-01-10 The satellites were transitioned from relative pointing to nadir pointing at 00:00. - mpaik

2022-01-12 The satellites were transitioned back to relative pointing at 00:00.

LRIs on both satellites were commanded to Reacquisition Mode at 00:05 and entered Science Mode shortly thereafter. - mpaik

2022-01-15 GRACE-D Possible micrometeoroid impact at 19:55:07 (delta-v of approximately -0.061 microns/sec). - cmccullo

2022-01-16 The LRI on GRACE-D was restarted to Master Role at 23:55. - cvolk

The LRIs on both satellites were restarted to Diagnostic Mode at 23:59.

2022-01-17 The satellites were transitioned from relative pointing to nadir pointing at 00:00. - cvolk

2022-01-18 GRACE-C IPU reboot (commanded) at 18:12:40 to resume tracking to all available GPS satellites. -cvolk, efahnest

2022-01-19 The satellites were transitioned back to relative pointing at 00:00 today. - cvolk

LRIs on both satellites were commanded to Reacquisition Mode at 00:05 and entered Science Mode shortly thereafter.

The LRI on GRACE-D was restarted to Transponder/Science Role at 00:15. New LRI datation available at 00:19:38.0

2022-01-23 The LRIs on both satellites were restarted to Diagnostic Mode at 23:59. - mpaik

2022-01-24 The satellites were transitioned from relative pointing to nadir pointing at 00:00. - mpaik

2022-01-25 The IPU was restarted at 20:20 in order to resume tracking to all available GPS satellites. - mpaik

GRACE-C IPU reboot (commanded) at 20:24:50 - mpaik

2022-01-26 The satellites were transitioned back to relative pointing at 00:00. - mpaik

LRIs on both satellites were commanded to Reacquisition Mode at 00:05 and entered Science Mode shortly thereafter.

2022-01-27 GPS PRN 22 was announced usable again. - mpaik

GRACE-C GPS PRN 22 was enabled and the IPU was restarted at 12:31 (South Pacific Ocean/OHG).

GRACE-D GPS PRN 22 was enabled and the IPU was restarted at 19:30 (western Europe/NSG).

GRACE-C IPU reboot (commanded) at 12:36:40

GRACE-D IPU reboot (commanded) at 19:41:00

2022-01-30 The LRIs on both satellites were restarted to Diagnostic Mode at 23:59. - cvolk

2022-01-31 The satellites were transitioned from relative pointing to nadir pointing at 00:00. - cvolk

2022-02-02 The satellites were transitioned back to relative pointing at 00:00. - cvolk

LRIs on both satellites were commanded to Reacquisition Mode at 00:05 and entered Science Mode shortly thereafter.

2022-02-06 The LRIs on both satellites were restarted to Diagnostic Mode at 23:59. - mpaik

2022-02-07 The satellites were transitioned from relative pointing to nadir pointing at 00:00.

2022-02-09 The satellites were transitioned back to relative pointing at 00:00. - mpaik

LRIs on both satellites were commanded to Reacquisition Mode at 00:05 and entered Science Mode shortly thereafter.

The IPU rebooted at 00:54 over western Siberia.

GRACE-C IPU reboot (commanded) at 01:00:00

2022-02-13 The LRIs on both satellites were restarted to Diagnostic Mode at 23:59. - cvolk

2022-02-14 The satellites were transitioned from relative pointing to nadir pointing at 00:00. - cvolk

GRACE-C IPU reboot (commanded) at 20:28:50 - efahnest

2022-02-15 GPS PRN 14 will be disabled at 17:15 (GRACE-D) and 19:55 (GRACE-C)

2022-02-16 The satellites were transitioned back to relative pointing at 00:00. - cvolk

LRIs on both satellites were commanded to Reacquisition Mode at 00:05 and entered Science Mode shortly thereafter.

GRACE-C IPU reboot (commanded) at 18:34:50 - efahnest

GRACE-D IPU reboot (commanded) at 19:39:30 - efahnest

2022-02-18 GRACE-C Possible micrometeoroid impact at 11:49:25 (delta-v of approximately 0.371 microns/sec). - cmccullo

2022-02-20 Center-of-Mass Calibrations (CMCal) were performed on both satellites in NOM-AH. - mpaik

GRACE-C The satellite was in NOM-AH mode from 08:41 to 20:20 and the following CMCal maneuvers were executed:

Yaw: 08:59, 12:08

Roll: 13:56, 15:31

Pitch: 17:05, 18:40, 20:01

GRACE-D The satellite was in NOM-AH mode from 07:45 2022-02-20 to 00:09 2022-02-21 and the following CMCal maneuvers were executed:

Pitch: 08:04, 17:16, 18:51

Roll: 14:08, 15:43

Yaw: 22:15, 23:49

2022-02-21 GRACE-C In preparation for switch to Transponder Role the LRI was commanded to Diagnostic Mode and a new parameter file was uploaded at 6:00. - mpaik

2022-02-22 GRACE-C The new file was installed at 00:00. - mpaik

2022-02-23 LRI Role Swap was performed at 00:00. Both LRIs successfully re-acquired the link and were in Science Mode. - mpaik

GRACE-C The LRI was restarted to Transponder Role at 00:00.

GRACE-D The LRI was restarted to Master Role at 00:00.

New LRI datations were available at 00:04:09.0

GRACE-C Possible micrometeoroid impact at 19:58:29 (delta-v of approximately 0.039 microns/sec). - cmccullo

2022-02-24 GPS PRN#32 was disabled in the IPUs (08:00 - 21:30) due to an announced period of unavailability. - mpaik

The IPUs on both satellites will be restarted at 21:40 (Venezuela).

GRACE-D IPU reboot (commanded) at 21:45:50

GRACE-C After the commanded restart, the IPU failed to reacquire the GPS navigation solution and rebooted at 21:56 (Canada/Baffin Bay).

IPU reboot (commanded) at 22:01:30

2022-02-26 GRACE-D Possible micrometeoroid impact at 08:25:19 (delta-v of approximately -0.150 microns/sec). - cmccullo

2022-03-06 GRACE-C Possible micrometeoroid impact at 10:57:07 (delta-v of approximately 0.041 microns/sec). - cmccullo

GRACE-D Possible micrometeoroid impact at 04:20:45 (delta-v of approximately -0.069 microns/sec). - cmccullo

2022-03-07 GRACE-D Possible micrometeoroid impact at 14:34:32 (delta-v of approximately -0.050 microns/sec). - cmccullo

2022-03-08 GRACE-D The IPU was restarted at 20:00 in order to resume tracking to all available GPS satellites. - mpaik

GRACE-D IPU reboot (commanded) at 20:07:10

GRACE-C Possible micrometeoroid impact at 10:13:15 (delta-v of approximately 0.386 microns/sec). - cmccullo

2022-03-10 GPS PRN#02 was disabled in the IPUs (22:15 through 11:46 2022-03-11) due to an announced period of unavailability. - mpaik

GRACE-C Possible micrometeoroid impact at 09:30:44 (delta-v of approximately 0.026 microns/sec). - cmccullo

2022-03-11 The IPUs on both satellites were restarted at 11:50 (Canada/Inuvik Region) in order to resume tracking to all available GPS satellites. - mpaik

GRACE-D IPU reboot (commanded) at 11:55:50

GRACE-C IPU reboot (commanded) at 11:56:10

2022-03-12 GRACE-C Possible micrometeoroid impact at 08:47:27 (delta-v of approximately 0.371 microns/sec). - cmccullo

2022-03-13 GRACE-C Possible micrometeoroid impact at 14:04:13 (delta-v of approximately 0.004 microns/sec). - cmccullo

2022-03-16 Today at 7:21 several ACC Medium Severity Events (CS_EVT40100) were received. OBCP 43 was triggered which disabled ACC Anomaly Events.

The instrument is in nominal state and no immediate recovery action are necessary. - cvolk, mpaik

2022-03-17 GPS PRN#30 is disabled in the IPUs (13:00 through 02:31 tomorrow) due to an announced period of unavailability. - cvolk, mpaik

2022-03-18 The IPUs on both satellites were restarted at 03:01 (Norway) in order to resume tracking to all available GPS satellites. - cvolk

GRACE-D IPU reboot (commanded) at 03:06:00

GRACE-C IPU reboot (commanded) at 03:06:10

2022-03-24 GPS PRN#20 was disabled in the IPUs (14:00 through 03:31 2022-03-25) due to an announced period of unavailability. - mpaik

2022-03-25 The IPUs on both satellites were restarted at 03:32 (Norwegian Sea) in order to resume tracking to all available GPS satellites. - mpaik

GRACE-D IPU reboot (commanded) at 03:37:00

GRACE-C IPU reboot (commanded) at 03:37:40

2022-03-28 GPS PRN#14 was announced unusable and disabled in the IPU at 17:20 - efahnest

GRACE-C IPU reboot (spontaneous) at 06:03:10, over southern Brazil - efahnest

2022-03-30 GRACE-D Possible micrometeoroid impact at 19:51:02 (delta-v of approximately -0.023 microns/sec). - cmccullo

2022-03-31 GRACE-D Possible micrometeoroid impact at 08:11:48 (delta-v of approximately 0.250 microns/sec). - cmccullo

2022-04-05 GRACE-C Possible micrometeoroid impact at 19:05:39 (delta-v of approximately 0.145 microns/sec). - cmccullo

2022-04-06 GPS PRN 14 was enabled in the IPUs. Tracking of this PRN will be resumed after the IPU restart, scheduled at 15:18 2022-04-08. - mpaik

GRACE-D GPS PRN 14 was enabled at 12:55.

GRACE-C GPS PRN 14 was enabled at 14:30.

2022-04-08 GPS PRN 21 is disabled in the IPUs (01:45 through 15:16) due to an announced period of unavailability.

The IPUs on both satellites were restarted at 15:18 (Canary Islands) in order to resume tracking to all available GPS satellites. - mpaik

GRACE-C IPU reboot (commanded) at 15:23:50

GRACE-D IPU reboot (commanded) at 15:25:40

2022-04-09 GRACE-D at 15:05 the IPU PPS time incorrectly jumped by 34 sec and the on-board time synchronization to GPS was automatically disabled. - cvolk

2022-04-10 GRACE-D IPU reboot (commanded) at 02:26:40 in order to fix the PPS time. - efahnest

GRACE-C Possible micrometeoroid impact at 06:23:32 (delta-v of approximately 0.049 microns/sec). - cmccullo

2022-04-11 GRACE-D The on-board time synchronization to GPS will be re-enabled at 18:30. - cvolk, efahnest

2022-04-17 GRACE-C Possible micrometeoroid impact at 12:03:25 (delta-v of approximately -0.051 microns/sec). - cmccullo

2022-04-21 GPS PRN 17 was disabled in the IPUs (14:00 through 03:31 2022-04-22) due to an announced period of unavailability. - mpaik

2022-04-22 The IPUs on both satellites were restarted at 03:32 (Australia) in order to resume tracking to all available GPS satellites. - mpaik

GRACE-C IPU reboot (commanded) at 03:38:30

GRACE-D After the commanded restart at 03:32, the IPU failed to reacquire the GPS navigation solution and rebooted at 03:48 (Philippine Sea).

IPU reboot (commanded) at 03:53:30

2022-04-23 GRACE-C Possible micrometeoroid impact at 13:00:11 (delta-v of approximately -0.058 microns/sec). - cmccullo

2022-04-29 GRACE-C Possible micrometeoroid impact at 21:51:43 (delta-v of approximately -0.112 microns/sec). - cmccullo

2022-05-01 GRACE-C Possible micrometeoroid impact at 13:14:50 (delta-v of approximately -0.012 microns/sec). - cmccullo

2022-05-02 GRACE-D Possible micrometeoroid impact at 07:29:27 (delta-v of approximately 0.098 microns/sec). - cmccullo

2022-05-03 GRACE-D The IPU was restarted at 15:00 in order to resume tracking to all available GPS satellites. - mpaik

IPU reboot (commanded) at 15:10:00

2022-05-05 GRACE-C The IPU rebooted at 17:30 over the South Pacific Ocean. - mpaik

IPU reboot (spontaneous) at 17:34:20

Possible micrometeoroid impact at 11:46:45 (delta-v of approximately -0.218 microns/sec). - cmccullo

2022-05-06 GRACE-D Possible micrometeoroid impact at 05:38:03 (delta-v of approximately -0.078 microns/sec). - cmccullo

GRACE-C Possible micrometeoroid impact at 13:00:05 (delta-v of approximately -0.056 microns/sec). - cmccullo

2022-05-07 GRACE-D Possible micrometeoroid impact at 18:14:27 (delta-v of approximately 0.126 microns/sec). - cmccullo

2022-05-10 GRACE-C Possible micrometeoroid impact at 11:31:16 (delta-v of approximately -0.024 microns/sec). - cmccullo

GRACE-D Possible micrometeoroid impact at 08:23:13 (delta-v of approximately -0.082 microns/sec). - cmccullo

2022-05-16 GRACE-D Possible micrometeoroid impact at 06:30:05 (delta-v of approximately -0.266 microns/sec). - cmccullo

GRACE-C Possible micrometeoroid impact at 12:26:24 (delta-v of approximately -0.003 microns/sec). - cmccullo

2022-05-18 GRACE-D The ACC was restarted to Large Range Mode (LRM) at 09:56 in order to re-synchronize the ADC. At 10:04 the ADC was

transitioned to Nominal Range Mode (NRM) and ACC Event Report Generation was enabled. - mpaik

2022-05-19 GPS PRN 18 was disabled in the IPUs (18:45 through 08:16 2022-05-20) due to an announced period of unavailability. - mpaik

GRACE-C Possible micrometeoroid impact at 08:27:25 (delta-v of approximately 0.041 microns/sec). - cmccullo

2022-05-20 The IPUs on both satellites were restarted at 08:20 (South Pacific Ocean) in order to resume tracking to all available GPS satellites. - mpaik

GRACE-D IPU reboot (commanded) at 08:25:00

GRACE-C IPU reboot (commanded) at 08:25:10

2022-05-23 GRACE-C Possible micrometeoroid impact at 11:24:39 (delta-v of approximately -0.031 microns/sec). - cmccullo

2022-05-25 GRACE-D Possible micrometeoroid impact at 03:39:05 (delta-v of approximately 0.179 microns/sec). - cmccullo

Possible micrometeoroid impact at 05:06:39 (delta-v of approximately 0.080 microns/sec). - cmccullo

2022-05-26 GPS PRN 12 is disabled in the IPUs (15:45 through 05:16 2022-05-27) due to an announced period of unavailability.

GPS PRN 11 was announced usable again

GRACE-C GPS PRN 11 was enabled at 14:15 - cmccullo

GRACE-C Possible micrometeoroid impact at 19:37:06 (delta-v of approximately 0.139 microns/sec). - cmccullo

2022-05-27 The IPUs on both satellites were restarted around 05:17 in order to resume tracking to all available GPS satellites.

GRACE-C IPU reboot (commanded) at 05:22:20

GRACE-D IPU reboot (commanded) at 05:22:50 - cmccullo

2022-05-30 GRACE-D Possible micrometeoroid impact at 15:50:45 (delta-v of approximately 0.375 microns/sec). - cmccullo

2022-05-31 GRACE-D Possible micrometeoroid impact at 09:14:04 (delta-v of approximately -0.023 microns/sec). - cmccullo

2022-06-01 A potential collision event was reported between GF1 and COSMOS 2251 debris. - mpaik

The Time of Closest Approach (TCA) was at 21:00:20. An orbit maneuver was executed on GF1 to reduce the risk of collision.

On GF2 a formation keeping maneuver was performed. After the maneuvers (with delta-V of 0.01 m/s) orbits of both

satellites were raised by ca. 15m. - mpaik

GRACE-C A collision avoidance maneuver was performed:

19:38 transition from nadir to relative pointing

19:39 yaw turn around maneuver

20:14:25 OC thrusters activation for 69sec (in OCM)

20:19 yaw turn around maneuver to get back to nominal configuration

20:51 transition from nadir to relative pointing

GRACE-D A formation keeping maneuver was performed:

21:46 transition from nadir to relative pointing

21:48:55 OC thrusters activation for 70sec (in OCM)

21:53 transition from nadir to relative pointing

The collision avoidance maneuver on GF1 and the formation correction maneuver on GF2 were executed successfully.

2022-06-05 GRACE-D Possible micrometeoroid impact at 02:34:57 (delta-v of approximately 0.126 microns/sec). - cmccullo

2022-06-06 GPS PRN 15 is disabled in the IPUs (10:45 through 00:16 tomorrow) due to an announced period of unavailability.

2022-06-08 The IPUs on both satellites were restarted at 03:05 (Antarctica) in order to resume tracking to all available GPS satellites.

GRACE-D Possible micrometeoroid impact at 23:22:57 (delta-v of approximately -0.079 microns/sec). - cmccullo

2022-06-09 GRACE-D Possible micrometeoroid impact at 04:19:31 (delta-v of approximately 0.043 microns/sec). - cmccullo

2022-06-13 GRACE-D The IPU rebooted at 16:51 over Antarctica. - mpaik

IPU reboot (spontaneous) at 16:57:50

The flex power is in â€œALL ONâ€ mode.

2022-06-14 GRACE-C Several KBR Missed Interrupts were experienced between 2022-06-13 23:69:22 and 2022-06-14 03:05:12 which were detected and corrected onboard. - mpaik

2022-06-17 GRACE-D The IPU rebooted at 12:30 over Paraguay. - mpaik

IPU reboot (spontaneous) at 12:35:50

2022-06-18 The flex power â€œALL ONâ€ mode is off after 5 days. - mpaik

2022-06-22 An orbit raise maneuver was performed on both satellites. Inter-satellite measurements were stopped for the duration of the maneuvers:

02:25 the IPUs were restarted with K/Ka trackers disabled

02:30 the LRIs were commanded to Diagnostic Mode

02:34 GRACE-C transitioned to nadir pointing

03:06 GRACE-D transitioned to nadir pointing

03:10:05 GRACE-C orbit raise performed, OC thrusters were activated for 29m50s, 0.2645 m/s

03:10:19 GRACE-D orbit raise performed, OC thrusters were activated for 29m23s, 0.2607 m/s

14:30 GRACE-C a yaw turnaround maneuver was performed (in NOM-ACQ)

15:05 GRACE-C transitioned back to relative pointing

15:05 GRACE-D transitioned back to relative pointing

15:15 the IPUs were restarted to Normal Mode with K/Ka trackers enabled.

15:20 the LRIs were commanded to Re-acquisition Mode and entered Science Mode shortly thereafter.

Orbits of both satellites were raised by ca. 460m.

2022-06-23 GRACE-C Possible micrometeoroid impact at 06:02:33 (delta-v of approximately -0.060 microns/sec). - cmccullo

2022-06-24 GPS PRN 9 is disabled in the IPUs (06:15 through 19:46) due to an announced period of unavailability. - cvolk

The IPUs on both satellites will be restarted at 19:50 (North Pole) in order to resume tracking to all available GPS satellites.

GRACE-D IPU reboot (commanded) at 19:54:20

GRACE-C IPU reboot (commanded) at 19:55:00

2022-06-30 GPS PRN 8 is disabled in the IPUs (06:00 through 19:30) due to an announced period of unavailability. - mpaik

The IPUs on both satellites were restarted at 19:50 (South Atlantic/Southern Ocean) in order to resume tracking to all available GPS satellites.

GRACE-C IPU reboot (commanded) at 19:54:50

GRACE-D IPU reboot (commanded) at 19:54:50

2022-07-01 The LRIs on both satellites were restarted to Diagnostic Mode yesterday at 23:59. - mpaik

The satellites were transitioned from relative pointing to nadir pointing at 00:00. LRI measurements are suspended but LRIDATATION cards at 00:00:21

2022-07-07 GRACE-D A drift correction maneuver was executed at 02:41:17 (SOE has time 02:41:35.591851). Orbit Control Thrusters were activated for 24sec providing a delta-V of 0.3493 cm/s. - efahnest

2022-07-14 GPS PRN 2 is disabled in the IPUs (12:55 through 2022-07-15 14:26) due to an announced period of unavailability. - cmccullo

2022-07-15 The IPUs on both satellites were restarted at 14:30 (South Pacific Ocean) in order to resume tracking to all available GPS satellites. - cmccullo

GRACE-D IPU reboot (commanded) at 14:34:40

GRACE-C IPU reboot (commanded) at 14:35:50 - efahnest

2022-07-29 GPS PRN 4 was disabled in the IPUs (00:30 through 14:01) due to an announced period of unavailability.

The IPUs on both satellites were restarted at 14:02 (South Pacific Ocean) in order to resume tracking to all available GPS satellites.

GRACE-C IPU reboot (commanded) at 14:02:22 - efahnest

GRACE-D IPU reboot (commanded) at 14:07:00 - efahnest

GRACE-C Shortly after the scheduled restart, the IPU rebooted at 14:18 over the North Pacific Ocean

GRACE-C IPU reboot (spontaneous) at 14:23:40 - efahnest

2022-08-03 Orbit raise maneuvers were performed on both satellites

01:55:10 GRACE-C IPU reboot (commanded) with K/Ka trackers disabled

01:55:10 GRACE-D IPU reboot (commanded) with K/Ka trackers disabled

02:30:00 GRACE-C yaw turnaround maneuver performed

02:30:24 GRACE-D 1st orbit raise maneuver started, duration = 29m50s, dv = 0.2647 m/s

02:30:29 GRACE-C 1st orbit raise maneuver started, duration = 29m40s, dv = 0.2633 m/s

07:15:24 GRACE-D 2nd orbit raise maneuver started, duration = 29m50s, dv = 0.2647 m/s

07:15:29 GRACE-C 2nd orbit raise maneuver started, duration = 29m40s, dv = 0.2633 m/s

20:00:14 GRACE-C yaw turnaround maneuver performed

21:59:55 GRACE-D orbit correction maneuver started, duration = 28s, dv = 0.004168 m/s

22:13:50 GRACE-C IPU reboot (commanded) to Normal Mode with K/Ka trackers enabled

22:13:50 GRACE-D IPU reboot (commanded) to Normal Mode with K/Ka trackers enabled

2022-08-08 Update of the LRI FPGA image to version 511 started on both satellites. - mpaik

2022-08-11 Ongoing update of the LRI FPGA image to version 5.11.

GPS PRN 31 was disabled in the IPUs (20:45 through 2022-08-12 10:16) due to an announced period of unavailability. - mpaik

2022-08-12 The IPUs on both satellites were restarted at 10:40 (Gulf of Mexico) in order to resume tracking to all available GPS satellites. - mpaik

GRACE-C IPU reboot (commanded) at 10:46:10 - efahnest

GRACE-D IPU reboot (commanded) at 10:47:30 - efahnest

2022-08-14 Upload of the LRI FPGA image to version 5.11 was completed. - efahnest

2022-08-21 GRACE-C An orbit lowering collision avoidance maneuver was successfully executed at 00:48:51 UTC. - efahnest

GRACE-C A constellation correction maneuver followed at 16:29:57 UTC, which was successful in raising the orbit to re-establish formation with GF2. - efahnest

2022-08-22 Center-of-Mass Calibrations (CMCal) were started, continuing through 2022-08-23. Both satellites in NOM-AH for the CMCals.

GRACE-C transitioned to NOM-AH at 17:39. LRI was switched to auto acquisition mode, with mirror scanning enabled at 17:44. The following CMCal maneuvers were executed:

- Pitch: 18:34

- Yaw: 21:04

- Roll: 22:54

GRACE-D transitioned to NOM-AH at 17:39. LRI was switched to auto acquisition mode, with mirror scanning enabled at 17:44. The following CMCal maneuvers were executed:

- Roll: 23:03

2022-08-23 Center-of-Mass Calibrations (CMCal) were completed. Both satellites in NOM-AH for the CMCals.

GRACE-C The following CMCal maneuvers were executed:

- Roll: 00:28

- Pitch: 02:03 & 03:37

- Yaw: 07:10

GRACE-C Autonomous transition to NOM-FP was enabled at 07:25.

GRACE-D The following CMCal maneuvers were executed:

- Roll: 00:38

- Pitch: 02:12, 03:47 & 06:31

- Yaw: 08:45 & 10:20

GRACE-D Autonomous transition to NOM-FP was enabled at 10:35.

For both GRACE-C and GRACE-D, LRI auto acquisition mode and mirror scanning were disabled, followed by a warm reset of LRI at 10:40. New LRI datation cards at 11:00:21

2022-08-26 A Missed Interrupt occurred around 16:49:52. KBR restart tracker command was issued on 2022-08-27 at 02:03:02 (per SOE), which cured the issue. - mpaik, efahnest

2022-08-30 GRACE-D autonomous onboard KBR Missed Interrupt Handling was enabled in the IPU at 02:35

2022-09-01 The satellites were transitioned back to relative pointing at 00:00 today.

LRIs on both satellites were commanded to Reacquisition Mode at 00:05 and entered Science Mode shortly thereafter. - cvolk

2022-09-04 New LRI parameter files for FPGA v5.11 were uploaded in Diagnostic Mode: - mpaik`

GRACE-C The LRI was commanded to Diagnostic Mode at 04:53 and the parameter files were uploaded.

GRACE-D The LRI was commanded to Diagnostic Mode at 02:13 and the parameter files were uploaded.

2022-09-05 The parameter files were installed and the LRI on both satellites will be restarted and the new FPGA will be activated in the next couple of days. - mpaik

2022-09-06 GRACE-D The LRI was restarted with the new FPGA v.5.11 at 14:30 and entered Reacquisition Mode shortly thereafter. - mpaik

2022-09-07 GRACE-C The LRI was restarted with the new FPGA v.5.11 at 01:07 and entered Science Mode three minutes later. - mpaik

The LRI is operating in Science Mode since 01:10.

2022-09-08 GPS PRN 26 is disabled in the IPUs (10:45 through 2022-09-09 00:16) due to an announced period of unavailability. - mpaik

GPS PRN 23 has been announced unusable until further notice and will be disabled in the IPU at the next uplink contact.

2022-09-09 The IPUs on both satellites were restarted at 03:30 (west of Spain) in order to resume tracking to all available GPS satellites. - mpaik

GRACE-D IPU reboot (commanded) at 03:39:30 - efahnest

GRACE-C IPU reboot (commanded) at 03:42:20 - efahnest

2022-09-15 GPS PRN 06 is disabled in the IPUs (13:30 through 03:01 tomorrow) due to an announced period of unavailability. - cvolk

2022-09-16 LRI Role Swap was performed today at 00:00. Both LRIs successfully re-acquired the link and are in Science Mode. - cvolk

GRACE-C restarted to master role at 00:00

GRACE-D restarted to transponder role at 00:00

GRACE-D PRN06 was disabled in the IPU at 00:51

GRACE-C PRN06 was disabled in the IPU at 02:30

The IPUs on both satellites were restarted at 03:05 (western Pacific Ocean) in order to resume tracking of all GPS satellites

GRACE-C IPU reboot (commanded) at 03:09:40 - efahnest

GRACE-D IPU reboot (commanded) at 03:12:10 - efahnest

GRACE-D PRN 30 was enabled and the IPU was rebooted at 13:52 to resume tracking

GRACE-D IPU reboot (commanded) at 13:56:00 - efahnest

2022-09-17 GRACE-C PRN 30 was enabled and the IPU was rebooted to resume tracking

GRACE-C IPU reboot (commanded) at 13:33:10 - efahnest

2022-09-22 GPS PRN 06 was disabled in the IPUs (13:15 through 2022-09-23 02:46) due to an announced period of unavailability. - mpaik

2022-09-23 The IPUs on both satellites were restarted at 03:01 (North Atlantic Ocean) in order to resume tracking to all available GPS satellites. - mpaik

GRACE-C IPU reboot (commanded) at 03:06:00

GRACE-D IPU reboot (commanded) at 03:13:10

2022-09-27 A 24h AOCS test to minimize thrusters activity started today morning at 06:15.

A new AOCS parameter set was uploaded (in NOM-AH) to allow wider relative pointing angles.

With the new settings it is not possible to acquire LRI link, therefore the LRI was commanded to Diagnostic Mode at 06:00.

For the test, both satellites were commanded to nadir pointing at 06:04. - cvolk

2022-09-28 The 24h AOCS test ended at 06:17 when AOCS parameters were reset back to the dafault settings (in NOM-AH).

The satellites were transitioned back to relative pointing at 06:30.

At 06:35, the LRIs on both satellites were commanded to Reacquisition Mode and entered Science Mode shortly thereafter. - cvolk

2022-09-29 GPS PRN 05 will be disabled in the IPUs (21:00 through 10:31 tomorrow) due to an announced period of unavailability. - cvolk

2022-09-30 The IPUs on both satellites were restarted at 10:42 (Indian Ocean) in order to resume tracking to all available GPS satellites. - mpaik

GRACE-C IPU reboot (commanded) at 10:47:40

GRACE-D IPU reboot (commanded) at 10:47:40

2022-10-05 GPS PRN 23 was enabled in the IPUs. The tracking to this PRN will be activated after the IPU restart which is planned on 7-Oct. - mpaik

2022-10-06 GPS PRN 03 was disabled in the IPUs (12:55 through 2022-10-07 02:26) due to an announced period of unavailability. - mpaik

2022-10-07 The IPUs on both satellites were restarted at 03:01 (Philippine Sea) in order to resume tracking to all available GPS satellites. - mpaik

GRACE-C IPU reboot (commanded) at 03:05:10

GRACE-D IPU reboot (commanded) at 03:06:00

2022-10-11 GPS PRN 25 is disabled in the IPUs (06:00 through 14:01 tomorrow) due to an announced period of unavailability. - cvolk

2022-10-13 GPS PRN 32 is disabled in the IPUs (13:00 through 20:31 tomorrow) due to an announced period of unavailability. - cvolk

2022-10-14 The IPUs on both satellites were restarted at ~20:35 (Arctic Ocean) in order to resume tracking to all available GPS satellites. - efahnest

GRACE-C IPU reboot (commanded) at 20:40:10 - efahnest

GRACE-D IPU reboot (commanded) at 20:41:20 - efahnest

2022-10-18 GPS PRN 24 was disabled (13:00 - 20:01) and PRN 09 was disabled (20:30 - 00:01 2022-10-19) in the IPUs due to an announced period of unavailability. - mpaik

2022-10-19 The IPUs on both satellites were restarted at 03:01 (western Russia) in order to resume tracking to all available GPS satellites. - mpaik

GRACE-C IPU reboot (commanded) at 03:05:30

GRACE-D IPU reboot (commanded) at 03:05:40

GPS PRNs were disabled in the IPUs due to an announced period of unavailability:

PRN 03 from 17:30 through 23:01

PRN 27 from 21:00 through 03:01 2022-10-20

2022-10-20 The IPUs on both satellites were restarted at 03:02 (Western Australia) in order to resume tracking to all available GPS satellites. - mpaik

GRACE-D IPU reboot (commanded) at 03:07:40

GRACE-C IPU reboot (commanded) at 03:10:50

GPS PRNs were disabled in the IPUs due to an announced period of unavailability:

PRN 26 from 18:30 through 00:01 2022-10-21

PRN 08 from 22:30 through 04:01 2022-10-21

2022-10-21 The IPUs on both satellites were restarted at 04:02 (Hunan, China) in order to resume tracking to all available GPS satellites. - mpaik

GRACE-C IPU reboot (commanded) at 04:07:20

GRACE-D IPU reboot (commanded) at 04:16:30

GPS PRN 10 was disabled (12:20 - 17:01) and PRN 01 was disabled (16:00 - 21:31) in the IPUs due to an announced period of unavailability.

2022-10-22 The IPUs on both satellites were restarted at 03:05 (North Atlantic Ocean). - mpaik

GRACE-C IPU reboot (commanded) at 03:10:10

GRACE-D IPU reboot (commanded) at 03:10:50

2022-10-26 Orbit raise maneuvers were performed on both satellites. - mpaik

At 00:30 the IPUs were restarted with K/Ka trackers disabled.

00:34 the LRIs were commanded to Diagnostic Mode

Orbits of both satellites were raised by ca. 960m.

At 16:15 the IPUs were restarted to Normal Mode with K/Ka trackers enabled and KBR measurement were resumed.

At 16:17 the LRIs were commanded to Re-acquisition Mode and entered Science Mode shortly thereafter.

GRACE-C At 00:40 a yaw turn-around maneuver was performed (in NOM-ACQ)

At 01:15:05 the 1st orbit raise maneuver was performed in OCM: duration= 29min50sec, dV=0.2654 m/s

At 05:00:05 the 2nd orbit raise maneuver was performed in OCM: duration= 29min50sec, dV=0.2655 m/s

At 14:00 a yaw turn-around maneuver was performed (in NOM-ACQ)

IPU reboot (commanded) at 16:20:10

GRACE-D At 01:15:10 the 1st orbit raise maneuver was performed in OCM: duration= 29min40sec, dV=0.2635 m/s

At 05:00:10 the 2nd orbit raise maneuver was performed in OCM: duration= 29min40sec, dV=0.2637 m/s

At 16:03:45 an orbit correction maneuver was performed in OCM: duration= 29sec, dV=0.4237 cm/s

IPU reboot (commanded) at 16:20:10

2022-10-28 The IPU rebooted at 10:25 over the North Pacific Ocean. - mpaik

GRACE-D IPU reboot (spontaneous) at 10:31:10

2022-10-30 The IPU rebooted at 15:07 over Argentina. - mpaik

GRACE-D IPU reboot (spontaneous) at 15:12:20

2022-11-02 GPS PRN 30 was disabled in the IPUs (22:25 through 11:56 2022-11-03) due to an announced period of unavailability. - mpaik

2022-11-03 GPS PRN 12 was disabled (04:25 - 17:56) and PRN 17 was disabled (22:30 - 12:01 2022-11-04) in the IPUs due to an announced period of unavailability.

The IPUs on both satellites was restarted at 17:57 (western Canada) in order to resume tracking to all available GPS satellites. - mpaik

GRACE-D IPU reboot (commanded) at 18:02:10

GRACE-C IPU reboot (commanded) at 18:02:20

2022-11-04 GPS PRN 29 is disabled in the IPUs (07:15 - 20:46) due to an announced period of unavailability. - mpaik

The IPUs on both satellites was restarted at 20:47 (North Pacific Ocean) in order to resume tracking to all available GPS satellites.

GRACE-C IPU reboot (commanded) at 20:50:40

GRACE-D IPU reboot (commanded) at 20:51:00

2022-11-07 GPS PRN 05 (08:31 - 20:01) and PRN 15 (10:30 - 00:01 tomorrow) are disabled in the IPUs due to an announced period of unavailability.

GRACE-D IPU reboot (spontaneous) at 23:18:40 - cvolk

2022-11-08 The IPUs on both satellites were restarted at 03:05 (North Atlantic Ocean) in order to resume tracking to all available GPS satellites.

GRACE-C IPU reboot (commanded) at 03:09:30 - cvolk

GRACE-D IPU reboot (commanded) at 03:09:30 - cvolk

2022-11-09 GPS PRN 31 will be disabled in the IPUs (18:16 through 07:46 tomorrow) due to an announced period of unavailability.

2022-11-10 GPS PRN 02 is disabled in the IPUs (23:30 yesterday - 01:01 tomorrow) due to an announced period of unavailability.

2022-11-11 The IPUs on both satellites were restarted at 03:30 (Caribbean Sea) in order to resume tracking to all available GPS satellites.

GRACE-C IPU reboot (commanded) at 03:34:30 - cvolk

GRACE-D IPU reboot (commanded) at 03:34:50 - cvolk

2022-11-13 GRACE-C The STR-A rebooted at 00:56 over the South Atlantic Ocean. - mpaik

2022-11-14 GPS PRN 07 was disabled in the IPUs (20:30 - 10:01 2022-11-15) due to an announced period of unavailability. - mpaik

2022-11-15 GPS PRN 06 was disabled in the IPUs (02:45 - 16:16) due to an announced period of unavailability.

The IPUs on both satellites were restarted at 16:17 (Kazakhstan) in order to resume tracking to all available GPS satellites. - mpaik

GRACE-D IPU reboot (commanded) at 16:23:00

GRACE-C IPU reboot (commanded) at 16:23:10

2022-11-16 GPS PRN 15 was disabled in the IPUs (09:30 - 23:01) due to an announced period of unavailability. - mpaik

L2C Radio Occultation measurements for PRN 11 were enabled in the IPU at 22:13(GF1) and 20:36(GF2).

2022-11-17 The IPUs on both satellites were restarted at 03:05 (Arctic Ocean) in order to resume tracking to all available GPS satellites. - mpaik

GRACE-D IPU reboot (commanded) at 03:09:20

GRACE-C IPU reboot (commanded) at 03:10:20

2022-11-18 GRACE-D IPU reboot (spontaneous) at 19:27:10 - mpaik

2022-11-22 Orbit raise manevuers were performed on both satellites - cvolk

At 04:00:22 the IPUs were restarted with K/Ka trackers disabled.

04:04 the LRIs were commanded to Diagnostic Mode

Orbits of both satellites were raised by ca. 480m.

At 21:30:22 the IPUs were restarted to Normal Mode with K/Ka trackers enabled and KBR measurement were resumed.

At 21:32 the LRIs were commanded to Re-acquisition Mode and entered Science Mode shortly thereafter.

GRACE-C IPU reboot (commanded) at 04:05:10

At 04:10 a yaw turn-around maneuver was performed (in NOM-ACQ)

At 04:45:05 the 1st orbit raise maneuver was performed in OCM: duration= 29min50sec, dV=0.2654 m/s

At 20:15 a yaw turn-around maneuver was performed (in NOM-ACQ)

IPU reboot (commanded) at 21:35:40

GRACE-D IPU reboot (commanded) at 04:05:10

At 04:45:10 the 1st orbit raise maneuver was performed in OCM: duration= 29min40sec, dV=0.2637 m/s

At 16:30:35 an orbit correction maneuver was performed in OCM: duration= 16sec, dV=0.2262 cm/s

IPU reboot (commanded) at 21:37:50

2022-12-05 Flex power is â€œALL Onâ€ mode again from 2022-12-05 00:00:00 UTC. - mpaik

2022-12-06 GPS PRN 31 is disabled in the IPUs (08:30 - 10:01 tomorrow) due to an announced period of unavailability. - cvolk

GRACE-D IPU reboot (spontaneous) at 10:51 over the South Atlantic Ocean

GRACE-C & GRACE-D autonomous KBR restart tracker command at 22:25:22 - cvolk

2022-12-07 The IPUs on both satellites were restarted at 10:02 (North Atlantic Ocean) in order to resume tracking to all available GPS satellites. - cvolk

GRACE-C IPU reboot (commanded) at 10:06:00 - efahnest

GRACE-D IPU reboot (commanded) at 10:06:00 - efahnest

2022-12-08 GPS PRN 26 is disabled in the IPUs (11:30 - 13:02 tomorrow) due to an announced period of unavailability. - cvolk

GRACE-D, AOCS parameters in SGM were updated today with their RAM values.

2022-12-09 The IPUs on both satellites were restarted at 13:02 (Antarctica) in order to resume tracking to all available GPS satellites.

GRACE-C, AOCS parameters update in SGM was started.

GRACE-C IPU reboot (commanded) at 13:08:10 - efahnest

GRACE-D IPU reboot (commanded) at 13:08:30 - efahnest

2022-12-10 Flex power is out of â€œALL ONâ€ mode and back to its nominal mode. - mpaik

2022-12-12 GRACE-D autonomous KBR restart tracker command at 23:19:04 - cvolk

2022-12-13 LRI parameter files for the low CNR scan were enabled and both LRIs were restarted. - mpaik

GRACE-D The LRI was restarted at 06:14.

GRACE-C The LRI was restarted at 07:48. AOCS parameters update in SGM was finished at 08:05.

GPS PRN 23 was disabled in the IPUs (09:30 - 11:02 2022-12-14) due to an announced period of unavailability.

2022-12-14 The IPUs on both satellites were restarted at 11:10 (Weddell Sea) in order to resume tracking to all available GPS satellites. - mpaik

GRACE-C IPU reboot (commanded) at 11:15:10

GRACE-D IPU reboot (commanded) at 11:15:30

GRACE-D autonomous KBR restart tracker command at 22:42:22 - cvolk

GRACE-C autonomous KBR restart tracker command at 22:42:24

2022-12-15 LRI low CNR scans were performed on both satellites from 00:00 through 14:00. At 14:00 nominal parameter files were restored and both LRI were restarted to science mode.

Four LRI reboots were commanded (14:30 - 14:40) in order to validate all four flight software images.

GPS PRN 31 is disabled in the IPUs (08:30 - 15:01 2022-12-16) due to the announced period of unavailability.

GRACE-C autonomous KBR restart tracker command at 22:20:42 - cvolk

GRACE-D autonomous KBR restart tracker command at 22:20:44

2022-12-16 The IPUs on both satellites were restarted at 15:05 (South Pacific Ocean) in order to resume tracking to all available GPS satellites. - mpaik

GRACE-C IPU reboot (commanded) at 15:10:30

GRACE-D IPU reboot (commanded) at 15:10:30

2022-12-17 GRACE-D After the commanded IPU restart on 2022-12-16, the IPU stopped to track KBR signals. Therefore another IPU restart was performed on Saturday, 2022-12-17 at 04:43. - efahnest

GRACE-D IPU reboot (commanded) at 04:49:20

After the restart, the KBR tracking was resumed.

2022-12-19 The autonomous Missed Interrupt (MI) handling was reconfigured in the IPU: the floor setting was changed from 0.05 to 0.07. - efahnest

GRACE-C MI setting was reconfigured at 05:35.

GRACE-D MI setting was reconfigured at 07:10.

2022-12-20 GPS PRN 19 is disabled in the IPUs (15:15 - 04:46 tomorrow) due to an announced period of unavailability.

2022-12-21 The IPUs on both satellites were restarted around 04:50 (Russland/Belarus) in order to resume tracking to all available GPS satellites. - cvolk

GRACE-C IPU reboot (commanded) at 04:58:40.

GRACE-D IPU reboot (commanded) at 04:57:10.

2022-12-31 A 24h AOCS test to minimize thrusters activity was started on 31-Dec-2022:

at 23:49 GF2 LRI was restarted to Master role and both LRIs were commanded to Diagnostic Mode.

at 23:54 both satellites were commanded to nadir pointing

at 23:58 a new AOCS parameter set was uploaded (in NOM-AH) to allow wider relative pointing angles (+-2deg).

2023-01-11 GPS PRN 22 was disabled in the IPUs due to an announced period of unavailability. - mpaik

GRACE-C GPS PRN 22 was disabled from 01:45 through 15:16.

GRACE-D GPS PRN 22 was disabled from 03:16 through 15:16.

The IPUs on both satellites were restarted at 15:25 (Sudan) in order to resume tracking to all available GPS satellites.

GRACE-C IPU reboot (commanded) at 15:30:20

GRACE-D IPU reboot (commanded) at 15:30:20

2023-01-20 The IPU rebooted at 03:12 over Libya. - mpaik

GRACE-D IPU reboot (spontaneous) at 03:18:30

2023-01-23 GPS PRN 22 was disabled in the IPUs until further notice at 16:30. - mpaik

Odometer: 26000 revolutions completed.

2023-01-26 GPS PRN 01 has been announced unusable until further notice. - mpaik

GRACE-C GPS PRN 01 was disabled at the OHG contact at 18:50.

GRACE-D GPS PRN 01 was disabled in the IPU at 14:40.

GPS PRN 25 was disabled in the IPUs (14:00 - 03:31 2023-01-27) due to an announced period of unavailability.

2023-01-27 The IPUs on both satellites were restarted at 03:32 (Norwegian Sea) in order to resume tracking to all available GPS satellites. - mpaik

GRACE-D IPU reboot (commanded) at 03:35:50

GRACE-C IPU reboot (commanded) at 03:38:30

GPS PRN 01 has been announced usable again.

GRACE-C GPS PRN 01 was enabled and the IPU was restarted at 14:15 over Black Sea/NSG.

GRACE-D GPS PRN 01 was enabled and the IPU was restarted at the OHG contact at 20:01.

GRACE-C IPU reboot (commanded) at 14:21:30

GRACE-D IPU reboot (commanded) at 20:09:20

2023-01-30 GPS PRN 01 has been announced unusable again and will be disabled in the IPUs. - cvolk

GRACE-C GPS PRN 01 will be disabled at the next OHG contact at 18:53.

GRACE-D GPS PRN 01 will be disabled at the next OHG contact at 17:19.

2023-01-31 GRACE-D A drift correction maneuver was performed at 06:30:30 in OCM: duration=36sec, dV=0.53 cm/s. The satellite orbit was raised by ca 9m. - cvolk

2023-02-03 GPS PRN 01 has been announced usable again and will be enabled in the IPU at 16:30. One minute later both IPUs will be restarted over the Arctic Ocean. - cvolk

GRACE-C IPU reboot (commanded) at 16:35:30 - mpaik

GRACE-D IPU reboot (commanded) at 16:35:30

2023-02-04 GRACE-D The IPU rebooted at 20:22 over the Pacific Ocean, west of Chile. - mpaik

GRACE-D IPU reboot (spontaneous) at 20:26:00

2023-02-16 GPS PRN 16 will be disabled in the IPUs (20:00 - 09:31 tomorrow) due to an announced period of unavailability. - cvolk

2023-02-17 The IPUs on both satellites were restarted at 09:32 (Siberia) in order to resume tracking to all available GPS satellites.

GPS PRN 28 was announced usable again and was enabled in the IPUs.

GRACE-D IPU reboot (commanded) at 09:37:20

GRACE-C IPU reboot (commanded) at 09:37:20

GRACE-D PRN 28 was enabled at 12:36.

GRACE-C PRN 28 was enabled at 14:08.

2023-02-18 GRACE-C Recording of STR images was not successful. The issue is being investigated. - mpaik

2023-02-25 The OD formal error cutoff was raised to 15cm (from 3cm) to remove a 15 min gap in the CLK1B

2023-02-27 GPS PRN 31 will be disabled in the IPUs (from 22:45 through 1-Mar 00:15) due to an announced period of unavailability. - cvolk

2023-03-01 The two-month AOCS test ended today:

at 00:00 the default AOCS settings were restored

at 00:10 the satellites were transitioned to relative pointing

at 00:15 LRIs on both satellites were commanded to reacquisition mode and entered science mode shortly thereafter.

The IPUs on both satellites were restarted at 03:00 (Tasman Sea) in order to resume tracking to all available GPS satellites. - cvolk

GRACE-D IPU reboot (commanded) at 03:05:50

GRACE-C IPU reboot (commanded) at 03:05:50

2023-03-04 Center-of-Mass Calibrations (CMCal) were performed on 4-Mar on both satellites in NOM-AH. - mpaik

GRACE-C The satellite was in NOM-AH mode on 4-Mar from 04:00 to 20:00 and the following CMCal maneuvers were executed:

Yaw: 06:46, 16:52

Roll: 13:29, 15:03

Pitch: 04:16, 18:12, 19:47

GRACE-D The satellite was in NOM-AH mode on 4-Mar from 04:50 to 18:40 and the following CMCal maneuvers were executed:

Yaw: 05:12, 18:27

Roll: 07:12, 08:46

Pitch: 10:21, 11:55, 16:13

2023-03-09 GPS PRN 07 was disabled in the IPUs (20:15 - 09:15 2023-03-10) due to an announced period of unavailability. - mpaik

2023-03-10 The IPUs on both satellites were restarted at 09:47 (western Pacific) in order to resume tracking to all available GPS satellites. - mpaik

GRACE-C IPU reboot (commanded) at 09:53:00

GRACE-D IPU reboot (commanded) at 09:55:20

2023-03-15 The IPU rebooted at 13:37 over Mauritania. - efahnest

GRACE-D IPU reboot (spontaneous) at 13:42:30 - efahnest

2023-04-06 GPS PRN 02 was disabled in the IPUs due to an announced period of unavailability. - mpaik

GRACE-C GPS PRN 02 was disabled from 2023-04-06 09:00 through 2023-04-07 10:31.

GRACE-D GPS PRN 02 was disabled from 2023-04-06 09:00 through 2023-04-07 10:31.

2023-04-07 The IPUs on both satellites were restarted at 10:32 in order to resume tracking all available GPS satellites. - mpaik

GRACE-D IPU reboot (commanded) at 10:36:10

GRACE-C IPU reboot (commanded) at 10:36:20

2023-04-13 GPS PRN 29 was disabled in the IPUs (17:45 - 07:16 2023-04-13) due to an announced period of unavailability. - mpaik

2023-04-14 The IPUs on both satellites were restarted at 07:17 (eastern Pacific) in order to resume tracking to all available GPS satellites. - efahnest

GRACE-D IPU reboot (commanded) at 07:22:40.0000

GRACE-C IPU reboot (commanded) at 07:22:50.0000

KBR restart trackers were autonomously commanded on both spacecraft at approximately 21:32:42 - cmccullo

2023-04-21 KBR restart trackers were autonomously commanded on both spacecraft at approximately 17:17:32 - cmccullo

GRACE-C Ka-band carrier phase data was missing from 735355044.55 (2023-04-21 13:17:24.55) to 735355084.45 (2023-04-21 13:18:04.45). - mpaik

This 40-second gap in the high-rate GRACE-C Ka phase data occurred due to a coinciding event of decoding and observing the log messages, which revealed a DSP fpga scrubbing event. This causes us to believe that a SEU corrupted a channel in the DSP fpga, and caused the 40 second gap. - Tim Rogstad

2023-04-23 GRACE-D IPU reboot (spontaneous) at 22:56:20 over the South Atlantic Ocean. - cvolk

The OD formal error cutoff was raised to 15cm (from 3cm) to remove large gaps in the CLK1B - cmccullo

2023-04-28 The IPU rebooted at 19:35:22 over the southern Indian Ocean. - cvolk

GRACE-C IPU reboot (spontaneous) at 19:41:30 - efahnest

2023-05-05 KBR restart trackers were autonomously commanded on both spacecraft at approximately 08:38:32 - cmccullo

2023-05-07 The LRI entered / was in a reacquisition mode at 06:43 - efahnest

2023-05-10 KBR restart trackers were autonomously commanded on both spacecraft at approximately 19:14:52 - cmccullo

2023-05-16 LRI PMH (Pump Module Head) scans was performed in diagnostic mode at 20:00 and last approx. 5 hours. The LRI on both satellites was in master mode during the test.

GRACE-C The LRI was restarted to master role at 19:30. After the test, the unit was restarted to transponder role at 01:16 2023-05-17. - mpaik

2023-05-17 K/Ka band trackers on both satellites were restarted at 18:06:52 by the onboard MI Monitor. - mpaik

2023-05-18 GPS PRN 20 was disabled in the IPUs (21:00 - 10:30 2023-05-19) due to an announced period of unavailability. - mpaik

2023-05-19 The IPUs on both satellites were restarted at 10:32 (North Atlantic Ocean) in order to resume tracking to all available GPS satellites. - mpaik

GRACE-C IPU reboot (commanded) at 10:37:00 - efahnest

GRACE-D IPU reboot (commanded) at 10:39:00 - efahnest

2023-05-26 The autonomous Missed Interrupt (MI) handling was reconfigured in the IPU: the floor setting was changed from 0.07 to 0.1. - cvolk

GRACE-C MI handling reconfigured at 07:43

GRACE-D MI handling reconfigured at 06:08

2023-06-02 GPS PRN 31 was disabled in the IPUs (12:00 - 01:31 2023-06-03) due to an announced period of unavailability. - mpaik

2023-06-03 The IPUs on both satellites were restarted at 03:05 (Russia/Perm Krai) in order to resume tracking to all available GPS satellites. - mpaik

GRACE-C IPU reboot (commanded) at 03:10:40

GRACE-D IPU reboot (commanded) at 03:10:40

2023-06-09 The IPUs on both satellites will be restarted today at 19:17, in order to resume tracking all available GPS satellites.

GRACE-C IPU reboot (commanded) at 19:28:40

GRACE-D IPU reboot (commanded) at 19:28:40

2023-06-12 Center-of-Mass Calibrations (CMCal) were performed in NOM-AH mode.

GRACE-C The satellite was transitioned to NOM-AH at 08:30. The following CMCal maneuvers were executed:

Pitch: 08:46 13:44 18:27

Yaw: 11:00 22:56

Roll: 15:19 16:53

At 23:10 the nominal NOM-FP mode was restored.

GRACE-D The satellite was transitioned to NOM-AH at 15:09. The following CMCal maneuvers were executed:

Pitch: 15:29 17:04 20:27

Yaw: 21:22 00:31

Roll: 18:37 23:22

At 00:50 on 2023-06-13 the nominal NOM-FP mode was restored.

The LRI was in Re-Acquisition mode from 17:09 to 21:23 after the parameter update on GF2. - mpaik

GRACE-D LRI pump module head temperature setting was updated at 17:09. - mpaik

2023-06-15 GRACE-D A drift correction maneuver was performed at 10:22:19 in OCM: duration=4sec, dV=0.06 cm/s. - efahnest

But SOE card gives center-time of actual maneuver at 10:22:35.5922

2023-06-30 GPS PRN 11 was disabled in the IPUs (03:45 - 17:16) due to an announced period of unavailability. - mpaik

The IPUs on both satellites were restarted at 17:17 (South Pacific Ocean) in order to resume tracking to all available GPS satellites.

GRACE-C IPU reboot (commanded) at 17:28:40

GRACE-D IPU reboot (commanded) at 17:31:50

A 6 months AOCS test to minimize thrusters activity was started. The LRI on both satellites was in diagnostic mode and master role during the test.

GRACE-C at 23:49:00 LRI was restarted to master role. At 23:53:30 LRI was commanded to diagnostic mode

GRACE-D at 23:49:00 LRI was commanded to diagnostic mode

At 23:53:45 both satellites were commanded to nadir pointing

At 23:58:00 AOCS parameters were modified (in NOM-AH) to allow wider relative pointing angles (+-2deg).

2023-07-06 GPS PRN 17 will be disabled in the IPUs (19:45 - 09:16 tomorrow) due to an announced period of unavailability.

2023-07-07 The IPUs on both satellites were restarted at 09:17 (South Indian Ocean) in order to resume tracking to all available GPS satellites.

GRACE-C IPU reboot (commanded) at 09:22:20

GRACE-D IPU reboot (commanded) at 09:22:30

2023-07-11 GPS PRN 1 and 28 were disabled in the IPUs until further notice. - mpaik

GRACE-C PRN 1 was disabled at 03:45. PRN 28 was disabled at 13:30.

GRACE-D PRN 1 was disabled at 02:10. PRN 28 was disabled at 15:05.

2023-07-14 GPS PRN 30 was disabled in the IPUs (00:15 - 13:46) due to an announced period of unavailability. - mpaik

GPS PRN 28 was announced usable again and will be enabled in the IPUs tomorrow at 03:50.

In order to resume tracking to all available GPS satellites the IPUs were restarted at 13:47:22 (Arctic Ocean).

GRACE-D IPU reboot (commanded) at 13:53:00

GRACE-C IPU reboot (commanded) at 13:53:10

2023-07-15 In order to resume tracking to all available GPS satellites the IPUs were restarted at 03:51:22 (Norwegian Sea) - mpaik

GRACE-C IPU reboot (commanded) at 03:56:50

GRACE-D IPU reboot (commanded) at 03:57:20

2023-07-17 The IPU rebooted at 01:05:53 over Mozambique -efahnest

GRACE-C IPU reboot (spontaneous) at 01:10:30 - efahnest

2023-07-27 GRACE-D A drift correction maneuver was performed at 03:58:51 in OCM: duration=46sec, dV=0.68 cm/s. The satellite orbit was raised by ca 13m. - mpaik

2023-07-30 GRACE-D KBR restart tracker was autonomously commanded at approximately 03:20:32 - cmccullo

2023-08-22 GPS PRN 22 was announced usable again and was re-enabled in the IPUs at 04:15. - mpaik

In order to resume tracking all available satellites, the IPUs were restarted at 04:16:22 (North Atlantic Ocean).

GRACE-D IPU reboot (commanded) at 04:20:30

GRACE-C IPU reboot (commanded) at 04:20:40

2023-08-23 GPS PRN 15 has been announced as unavailable and will be disabled in the IPUs at the next available uplink contact. - mpaik

2023-08-24 GPS PRN 15 has been announced as available again and will be re-enabled in the IPUs at the next available uplink contact. - mpaik

GRACE-D GPS PRN 15 was disabled in the IPU at 00:17.

GRACE-C GPS PRN 15 was disabled in the IPU at 02:54.

GRACE-C GPS PRN 15 was re-enabled in the IPU at 18:26

2023-08-25 GPS PRN 15 was re-enabled in the IPUs after it became available for use again. In order to resume tracking all GPS satellites, the IPUs were restarted at 06:05:22 (North Pacific Ocean). - mpaik

GRACE-D GPS PRN 15 was re-enabled in the IPU at 05:40.

GRACE-D IPU reboot (commanded) at 06:10:10

GRACE-C IPU reboot (commanded) at 06:11:00

2023-08-26 The GF2 IPU experienced a spontaneous reboot on 26 Aug at 13:38:16

GRACE-D IPU reboot (spontaneous) at 13:50:30 - mpaik

2023-08-27 GF1 IPU experienced spontaneous reboot on 27 Aug at 14:43:41

GRACE-C IPU reboot (spontaneous) at 14:51:30 - efahnest

GRACE-C a KBR Missed Interrupt occurred around 19:05:52

GRACE-C a KBR Missed Interrupt occurred around 20:39:14

2023-08-28 GF1 IPU experienced spontaneous reboot on 28 Aug at 09:45:05

GRACE-C IPU reboot (spontaneous) at 09:50:00 - cvolk

2023-08-31 GPS PRN 12 will be disabled in the IPUs (00:00-13:31 tomorrow) due to an announced period of unavailability.

2023-09-01 The IPUs on both satellites were restarted at 13:45 (South Atlantic Ocean) in order to resume tracking all available GPS satellites.

GRACE-C IPU reboot (commanded) at 13:50:20 - efahnest

GRACE-D IPU reboot (commanded) at 13:50:20 - efahnest

2023-09-07 GPS PRN 02 was disabled in the IPUs (18:15-07:46 2023-09-08) due to an announced period of unavailability. - mpaik

2023-09-08 The IPUs on both satellites were restarted at 07:50 (Antarctica) in order to resume tracking all available GPS satellites. - mpaik

GRACE-D IPU reboot (commanded) at 07:54:10

GRACE-C IPU reboot (commanded) at 07:54:30

2023-09-14 GPS PRN 09 will be disabled in the IPUs (22:15-11:46 tomorrow) due to an announced period of unavailability.

2023-09-15 The IPUs on both satellites were restarted at 11:47:22 (North Pacific Ocean) in order to resume tracking all available GPS satellites.

GRACE-D IPU reboot (commanded) at 11:52:00 - efahnest

GRACE-C IPU reboot (commanded) at 11:52:10 - efahnest

2023-09-24 The IPU rebooted at 19:41:30 over the North Pacific Ocean.

GRACE-C IPU reboot (spontaneous) at 19:47:20 - cvolk

2023-10-06 GPS PRN 22 was disabled in the IPUs (02:30 - 16:01) due to an announced period of unavailability. - mpaik

The IPUs on both satellites were restarted at 16:02 (Western Siberia) in order to resume tracking to all available GPS satellites.

GRACE-C IPU reboot (commanded) at 16:06:10

GRACE-D IPU reboot (commanded) at 16:07:20

2023-10-13 GPS PRN 21 was disabled in the IPUs (04:45 - 18:16) due to an announced period of unavailability.

The IPUs on both satellites were restarted at 18:17:22 (North Pacific Ocean) in order to resume tracking to all available GPS satellites.

GRACE-D IPU reboot (commanded) at 18:22:40 - efahnest

GRACE-C IPU reboot (commanded) at 18:23:50 - efahnest

2023-10-19 GRACE-D A drift correction maneuver was performed at 00:43:45 in OCM: duration=66sec, dV=0.98 cm/s. The satellite orbit was raised by ca 16m. - mpaik

GPS PRN 22 was disabled in the IPUs (14:45 - 03:46 2023-10-20) due to an announced period of unavailability.

2023-10-20 The IPUs on both satellites were restarted at 03:47 (North Pacific Ocean) in order to resume tracking to all available GPS satellites. - mpaik

GRACE-C IPU reboot (commanded) at 03:51:30

GRACE-D IPU reboot (commanded) at 03:51:30

2023-10-31 KBR restart trackers were autonomously commanded on both spacecraft at approximately 22:53:02 - mpaik

2023-11-02 GPS PRN 15 was temporarily disabled in the IPUs at 19:30. Both IPUs will be restarted tomorrow at 09:02. - mpaik

2023-11-03 The IPUs on both satellites were restarted at 09:02:22 in order to resume tracking to all available GPS satellites. - mpaik

GRACE-D IPU reboot (commanded) at 09:07:30

GRACE-C IPU reboot (commanded) at 09:17:10

KBR restart trackers were autonomously commanded on both spacecraft at approximately 20:00:24 - mpaik

2023-11-04 The IPU rebooted at 19:47:40, west of Portugal.

GRACE-D IPU reboot (spontaneous) at 19:52:50 - mpaik

2023-11-05 KBR restart trackers were autonomously commanded on both spacecraft at approximately 16:08:44 - mpaik

2023-11-28 GPS PRN 22 was disabled in the IPUs (09:00 - 10:31 2023-11-29) due to an announced period of unavailability. - mpaik

2023-11-29 The IPUs on both satellites were restarted at 10:32 (North Pacific Ocean) in order to resume tracking to all available GPS satellites. - mpaik

GRACE-C IPU reboot (commanded) at 10:41:20

GRACE-D IPU reboot (commanded) at 10:41:40

2023-11-30 GPS PRN 28 was disabled in the IPUs (11:30 - 01:01 2023-12-01) due to an announced period of unavailability. - mpaik

2023-12-01 The IPUs on both satellites were restarted at 03:15 (Antarctica) in order to resume tracking to all available GPS satellites. - mpaik

GRACE-D IPU reboot (commanded) at 03:19:30 - mpaik

GRACE-C IPU reboot (commanded) at 03:20:30 - efahnest

2023-12-07 An out-of-plane constellation correction maneuver was executed on GF2 to correct:

- drift of relative inclination

- drift rate between the two satellites

The orbit correction maneuver was executed in OCM mode:

- 02:28 attitude slew by 73deg was commanded

- 02:45:08 OCM thrusters were activated for 74sec providing dV=1.1cm/s

- 02:47 slew-back to the nominal attitude was commanded

MWI measurements ignored between attitude slew at 02:28 and their resumption at 02:55

GPS PRN 08 was disabled in the IPUs (18:00 - 07:31 2023-12-08) due to an announced period of unavailability. - efahnest

2023-12-08 The IPUs on both satellites were restarted at 07:35:22 (Greenland) in order to resume tracking to all available GPS satellites. - mpaik

GRACE-D IPU reboot (commanded) at 07:40:10

GRACE-C IPU reboot (commanded) at 07:40:40

2023-12-14 Four LRI reboots were commanded (16:30 - 16:40) in order to validate all four flight software images. - mpaik

GPS PRN was disabled in the IPUs (15:30 - 05:01 2023-12-15) due to an announced period of unavailability.

2023-12-15 The IPUs on both satellites were restarted at 05:20 (Antarctica) in order to resume tracking to all available GPS satellites. - mpaik

GRACE-C IPU reboot (commanded) at 05:23:50

GRACE-D IPU reboot (commanded) at 05:24:00

2023-12-21 GPS PRN 06 is disabled in the IPUs (09:45 - 23:16) due to an announced period of unavailability.

2023-12-22 The IPUs on both satellites were restarted at 03:05 (Bering Sea) in order to resume tracking to all available GPS satellites. - mpaik

GRACE-C IPU reboot (commanded) at 03:10:30

GRACE-D IPU reboot (commanded) at 03:13:10

2024-01-02 GPS PRN 27 is disabled in the IPUs until further notice, Disabled on GRACE-D (GF2) at 12:40 and on GRACE-C (GF1) at 14:10. - efahnest

2024-01-04 GRACE-D An in-plane collision avoidance maneuver was successfully executed at 16:03:50: duration=81sec, dV=1.2 cm/s. - cvolk

2024-01-05 GPS PRN 03 was disabled in the IPUs (06:15 - 19:46) due to an announced period of unavailability.

The IPUs on both satellites were restarted at 19:47:22 (west of Sumatra) in order to resume tracking to all available GPS satellites.

GRACE-C IPU reboot (commanded) at 19:54:50 - mpaik

GRACE-D IPU reboot (commanded) at 19:54:50 - mpaik

GRACE-C KBR Missed Interrupt autonomous restart tracker command at 21:40:12

2024-01-06 Executed an in-plane orbit maneuver (180 deg yaw / anti-flight direction) on GF2 to minimize the risk of collision

with another satellite and to restore the original formation.

Maneuver input from FDS:

-- DeltaV = 1.1 cm/s,

-- COB = 10:40:37 UTC

-- 74 sec on-time BOTH OCT starting at t0

-- t0 = 10:40:00 UTC

-- m0 = 596,363 kg (taken from latest PVT analysis 2024/DOY004)

09:55:00 - Thruster and NOM Ctrl parameters to DPG

10:05:00 - Rotate S/C of 180 deg (yaw)

10:37:30 - Transition NOM to OCM

10:40:00 - Initiate the burn with OCT11 and OCT22 thruster

Thruster burn between 10:40:00 and 10:41:14

10:41:54 - Transition from OCM to NOM

10:44:44 - Rotate S/C of 180 deg (yaw)

11:16:14 - Thruster and NOM Ctrl parameters [set-4] to DPG

GRACE-C KBR Missed Interrupt autonomous restart tracker command at 10:07:52

GRACE-D KBR Missed Interrupt autonomous restart tracker command at 10:07:54

GRACE-D KBR Missed Interrupt autonomous restart tracker command at 10:09:42

GRACE-C KBR Missed Interrupt autonomous restart tracker command at 10:10:02

GRACE-D KBR Missed Interrupt autonomous restart tracker command at 10:57:52

GRACE-D KBR Missed Interrupt autonomous restart tracker command at 10:59:54

2024-01-11 GPS PRN 24 was disabled in the IPUs (10:00 - 23:31) due to an announced period of unavailability. - mpaik

2024-01-12 The IPUs on both satellites were restarted at 03:01 (Antarctica) in order to resume tracking to all available GPS satellites. - mpaik

GRACE-C IPU reboot (commanded) at 03:05:00

GRACE-D IPU reboot (commanded) at 03:08:00

2024-01-15 GRACE-C Center-of-Mass Calibrations (CMCal) performed in NOM-AH mode. The satellite was transitioned to NOM-AH at 07:09.

The following CMCal maneuvers were executed:

Roll - 07:24 and 10:33

Pitch - 12:07, 13:41, and 16:24

Yaw - 18:41 and 20:12

At 20:25 the nominal NOM-FP mode was restored.

More detailed maneuver details are:

07:24:00 - 07:27:00 / ROLL / lon = -088Â° / 71.8Â° > lat > 60.5Â° / Eclipse, no blindings

10:32:30 â€“ 10:35:30 / ROLL / lon = -135Â° / 72.4Â° > lat > 60.9Â° / Eclipse, no blindings

12:07:00 â€“ 12:10:00 / PITCH / lon = -158Â° / 71.7Â° > lat > 60.3Â° / Eclipse, no blindings

13:41:00 â€“ 13:44:00 / PITCH / lon = -178Â° / 72.8Â° > lat > 61.5Â° / Eclipse, no blindings

16:24:00 â€“ 16:27:00 / PITCH / lon = -041Â° / 09.3Â° < lat < 20.9Â° / Sun, SC1 fully blinded

18:37:30 â€“ 18:40:30 / YAW / lon = +105Â° / 21.2Â° > lat > 09.7Â° / Eclipse, no blindings

20:12:00 â€“ 20:15:00 / YAW / lon = +082Â° / 20.5Â° > lat > 09.0Â° / Eclipse, no blindings - cmccullo

2024-01-18 GRACE-C A trim mass was moved to change CoM in x direction (body frame) by 120 Î¼m. - mpaik

- 16:41: switch on MTE-A

- 16:43: move trim mass in x axis forward by 5744 steps (14.36 mm)

- 16:45: switch off MTE-A

2024-01-20 GRACE-C Center-of-Mass Calibrations (CMCal) were performed. The satellite was transitioned to NOM-AH at 03:42. - mpaik

The following CMCal maneuvers were executed:

Roll: 06:52 08:26

Pitch: 04:00 10:00 13:09

Yaw: 16:31 18:06

At 18:19 the nominal NOM-FP mode was restored.

2024-01-23 GRACE-D The IPU was restarted at 19:40 (Arctic Ocean/SGS) in order to resume the nominal output of all DSP channels. - mpaik

GRACE-D IPU reboot (commanded) at 19:45:30 - efahnest

2024-01-24 GRACE-C The IPU was restarted at 14:28 (Greenland Sea/SGS) in order to resume the nominal output of the DSP channels 28. - mpaik

GRACE-C IPU reboot (commanded) at 14:33:00 - efahnest

2024-01-26 GPS PRN 05 was disabled in the IPUs (00:30 - 14:01) due to an announced period of unavailability.

The IPUs on both satellites were restarted at 14:02:22 (western Pacific Ocean) in order to resume tracking to all available GPS satellites. - efahnest

GRACE-C IPU reboot (commanded) at 14:07:00

GRACE-D IPU reboot (commanded) at 14:09:30 - mpaik

2024-02-06 GPS PRN 27 was enabled in the IPUs. It will be used effectively after the next IPU restart, scheduled for 10-Feb. - mpaik

2024-02-09 GPS PRNs 02 and 10 were disabled in the IPUs due to an announced period of unavailability: - mpaik

PRN02 from 01:00 to 2024-02-10 02:31

PRN10 from 14:30 to 2024-02-19 16:01

2024-02-10 The IPUs on both satellites were restarted at 03:18 (Weddel Sea) in order to resume tracking to all available GPS satellites. - mpaik

GRACE-C IPU reboot (commanded) at 03:22:40

GRACE-D IPU reboot (commanded) at 03:22:40

2024-02-19 GRACE-C The IPU rebooted at 10:49 over the South Atlantic Ocean. - cmccullo

GRACE-C IPU reboot (spontaneous) at 11:01:50

The IPUs on both satellites were restarted at 16:05 (Arctic Ocean) in order to resume tracking to GPS PRN 10. - mpaik

GRACE-C IPU reboot (commanded) at 16:09:30

GRACE-D IPU reboot (commanded) at 16:10:10

2024-02-21 GPS PRN 08 was disabled in the IPUs from 19:00 through 2024-03-02 20:31 due to an announced period of unavailability. - mpaik

2024-02-27 GRACE-D A drift correction maneuver was performed at 10:18:25 in OCM: duration=70sec, dV=1.03 cm/s - cmccullo

Full maneuver details:

10:03:25 - Thruster and NOM Ctrl parameters [LEOP default] to DPG

10:15:55 - Transition NOM to OCM

10:18:25 - Initiate the burn with OCT11 and OCT22 thruster

Thruster burn between 10:18:25 and 10:19:35

10:20:15 - Transition from OCM to NOM

10:23:35 - Thruster and NOM Ctrl parameters [set-4] to DPG

2024-03-02 The IPUs on both satellites were restarted at approximately 20:34:22 (Greece) in order to resume tracking to all available GPS satellites - cmccullo

GRACE-C IPU reboot (commanded) at 20:41:10

GRACE-D IPU reboot (commanded) at 20:40:20

2024-03-08 GPS PRN 04 is disabled in the IPUs (06:20 - 20:01) due to an announced period of unavailability. - mpaik

The IPUs on both satellites were restarted at 20:03 (Antarctica) in order to resume tracking to all available GPS satellites.

GRACE-D IPU reboot (commanded) at 20:07:30

GRACE-C IPU reboot (commanded) at 20:08:10

2024-03-20 GPS PRN 29 was disabled in the IPUs (13:30 - 03:01 2024-03-21) due to an announced period of unavailability. - mpaik

2024-03-21 The IPUs on both satellites were restarted at 03:04:22 (Bay of Campeche) in order to resume tracking to all available GPS satellites. - efahnest

GRACE-C IPU reboot (commanded) at 03:08:40 - mpaik

GRACE-D IPU reboot (commanded) at 03:09:30

2024-03-26 GRACE-C KBR Missed Interrupt autonomous restart tracker command at 00:59:32

GRACE-D KBR Missed Interrupt autonomous restart tracker command at 00:59:32

GRACE-C KBR Missed Interrupt autonomous restart tracker command at 13:32:52

GRACE-D KBR Missed Interrupt autonomous restart tracker command at 13:32:54 - cvolk

2024-03-27 GRACE-C KBR Missed Interrupt autonomous restart tracker command at 16:12:51 - mpaik

GRACE-D KBR Missed Interrupt autonomous restart tracker command at 16:12:52

2024-03-30 GRACE-C KBR Missed Interrupt autonomous restart tracker command at 05:31:24 - mpaik

GRACE-D KBR Missed Interrupt autonomous restart tracker command at 05:31:24

2024-04-01 GRACE-C KBR Missed Interrupt autonomous restart tracker command at 04:39:12 - mpaik

GRACE-D KBR Missed Interrupt autonomous restart tracker command at 04:39:12

2024-04-02 GRACE-C KBR Missed Interrupt autonomous restart tracker command at 16:48:52 - mpaik

GRACE-D KBR Missed Interrupt autonomous restart tracker command at 16:48:52

2024-04-03 GPS PRN 17 was disabled in the IPUs from 13:30 to April 13 due to an announced period of unavailability. - mpaik

2024-04-11 The IPU rebooted at 05:41 over the Indian Ocean. -cvolk

GRACE-D IPU reboot (spontaneous) at 05:46:20

2024-04-12 The IPUs on both satellites will be restarted tomorrow at 15:05 (Iran) in order to resume tracking to GPS PRN 17. - cvolk

2024-04-13 GRACE-C IPU reboot (commanded) at 15:10:10

GRACE-D IPU reboot (commanded) at 15:10:50

GRACE-C KBR Missed Interrupt autonomous restart tracker command at 15:47:02 - mpaik

2024-04-16 GRACE-D KBR Missed Interrupt autonomous restart tracker command at 15:27:52 - mpaik

GRACE-D KBR Missed Interrupt autonomous restart tracker command at 15:30:12

2024-04-20 The IPU rebooted at 23:02 over the North Atlantic Ocean. - mpaik

GRACE-C IPU reboot (spontaneous) at 23:06:10 - doubled up LRIDATATION cards!

2024-05-02 GRACE-C The MI setting was reconfigured at 21:20 - mpaik

2024-05-03 The autonomous Missed Interrupt (MI) handling was reconfigured in the IPU: the floor setting was changed from 0.1 to 0.11. - mpaik

GRACE-D The MI setting was reconfigured at 04:20

2024-05-15 GRACE-D A drift correction maneuver was performed at 06:11:49 in OCM: duration=66sec, dV=0.99 cm/s. - mpaik

Full maneuver details:

05:56:49 - GF2_NAOC_7120 - Thruster and NOM Ctrl parameters [LEOP default] to DPG

06:07:49 - GF2_NPUS_7100 - Set rate of SPID 21112 (SID 36) to 1 Hz

06:09:19 - GF2_NAOC_2200 - Transition NOM to OCM

06:11:49 - GF2_NAOC_4050 - Initiate the burn with OCT11 and OCT22 thruster

Thruster burn between 06:11:49 and 06:12:55

06:12:55 - GF2_NAOC_4060 - Disable OCT driver and perform OCT mech check

06:13:35 - GF2_NAOC_2300 - Transition from OCM to NOM

06:16:05 - GF2_NPUS_7100 - Set rate of SPID 21112 (SID 36) to the default rate of 1/6 Hz

06:16:55 - GF2_NAOC_7111 - Thruster and NOM Ctrl parameters [set-4] to DPG

2024-05-16 GPS PRN 25 was disabled in the IPUs (09:00 - 21:00) due to an announced outage. In the meantime, the outage has been rescheduled to 22-May. - mpaik

2024-05-18 GPS PRN 17 has been announced unusable until further notice and was disabled in the IPUs. - mpaik

The IPUs on both satellites were restarted at 03:01:22 (Pacific Ocean/Kiribati) in order to resume tracking to all available GPS satellites. - mpaik

GRACE-C IPU reboot (commanded) at 03:07:00 - efahnest, missing LRIDATATION!

GRACE-D IPU reboot (commanded) at 03:08:20 - efahnest, missing LRIDATATION!

2024-05-22 GPS PRN 25 is disabled in the IPUs (07:15 - 21:46) due to an announced outage.

GPS PRN 17 will be enabled in the IPUs at 20:47.

The IPUs on both satellites were restarted 20:50:22 (Indian Ocean) in order to resume tracking to all available GPS satellites.

GRACE-C IPU reboot (commanded) at 20:59:30 - efahnest, missing LRIDATATION!

GRACE-D IPU reboot (commanded) at 20:59:30 - efahnest, missing LRIDATATION!

GRACE-D IPU reboot (spontaneous) at 21:15:40 - efahnest, missing LRIDATATION!

2024-05-27 GRACE-D KBR Missed Interrupt autonomous restart tracker command at 20:42:34 - mpaik

2024-05-31 GPS PRN 16 was temporarily disabled in the IPUs (04:00 - 17:30) due to an announced outage.

The IPUs on both satellites were restarted at 18:05:22 (Antarctica) in order to resume tracking all available GPS satellites. - mpaik

GRACE-C IPU reboot (commanded) at 18:09:00 - mpaik

GRACE-D IPU reboot (commanded) at 18:10:00

2024-06-06 GPS PRN 7 has been announced as usable again and will be re-enabled in the IPUs at 18:35.

The IPUs on both satellites were restarted at 18:38:22 (Antarctica) in order to resume tracking all available GPS satellites.

GRACE-C IPU reboot (commanded) at 18:43:10

GRACE-D IPU reboot (commanded) at 18:44:10

2024-06-13 GPS PRN 20 was disabled in the IPUs (13:15 - 02:46 2024-06-14) due to an announced period of unavailability. - mpaik

2024-06-14 The IPUs on both satellites were restarted at 03:01 (south of Portugal) in order to resume tracking to all available GPS satellites. - mpaik

GRACE-D IPU reboot (commanded) at 03:06:40

GRACE-C IPU reboot (commanded) at 03:10:00

2024-06-18 GPS PRN 20 was disabled in the IPUs (13:00 - 02:31 2024-06-19) due to an announced period of unavailability. - cmccullo

2024-06-19 The IPUs on both satellites were restarted at 03:01:22 (south Pacific Ocean) in order to resume tracking to all available GPS satellites. - cmccullo

GRACE-D IPU reboot (commanded) at 03:07:10

GRACE-C IPU reboot (commanded) at 03:07:40

2024-06-27 GPS PRN 23 was disabled in the IPUs (16:30 - 06:01 2024-06-28) due to an announced period of unavailability. - efahnest

2024-06-28 The IPUs on both satellites were restarted at 06:10:22 (north Atlantic Ocean) in order to resume tracking to all available GPS satellites. - efahnest

GRACE-C IPU reboot (commanded) at 06:14:30 - mpaik

GRACE-D IPU reboot (commanded) at 06:14:30

2024-07-13 An in-plane maneuver to minimize the risk of collision with another satellite was performed on GF1. Science operations were interrupted from 2024-07-13 01:30 to 02:44.

GRACE-C The maneuver was executed at 02:05:17, duration=206sec, dV=+3.0 cm/s. - mpaik

GRACE-C KBR Missed Interrupt autonomous restart tracker command at 2024-07-13 01:33:12

GRACE-C KBR Missed Interrupt autonomous restart tracker command at 2024-07-13 01:35:13

GRACE-C KBR Missed Interrupt autonomous restart tracker command at 2024-07-13 02:24:43

GRACE-C KBR Missed Interrupt autonomous restart tracker command at 2024-07-13 02:28:02

GRACE-D KBR Missed Interrupt autonomous restart tracker command at 2024-07-13 01:33:14

GRACE-D KBR Missed Interrupt autonomous restart tracker command at 2024-07-13 01:35:14

GRACE-D The IPU rebooted on Saturday, 13-Jul at 01:47:00 over the Coral Sea - efahnest

GRACE-D IPU reboot (spontaneous) at 01:53:40 - efahnest

GRACE-D KBR Missed Interrupt autonomous restart tracker command at 2024-07-13 02:28:02

Full maneuver details are: - cmccullo

Execute an in-plane orbit maneuver (+0 deg yaw / flight direction) on GF1 on 2024.07.13 (DoY 195).

Maneuver input from FDS:

-- DeltaV = 3.0 cm/s,

-- COB = 2024-07-13 02:07:00 UTC (1720836420 unixTimeInSeconds)

-- 206 sec on-time BOTH OCT starting at t0

-- t0 = 2024-07-13 02:05:17 UTC

-- m0 = 595.223 kg (taken from latest PVT analysis 2024/DOY192.5)

The complete SSF is based on the Ground Operations Procedure GOP_NFOS_1300 - Create a maneuver sequence, Step 4.2 (Leader, Backward Flying, 180deg yaw bias, inflight direction maneuver):

01:20:17 - GF1_NAOC_7120 - Thruster and NOM Ctrl parameters [LEOP default] to DPG

01:30:17 - GF1_NAOC_4150 - Rotate S/C of 180 deg (yaw) - ASP60650 = 0.0

02:01:17 - GF1_NPUS_7100 - Set rate of SPID 21112 (SID 36) to 1 Hz

02:02:47 - GF1_NAOC_2200 - Transition NOM to OCM

02:05:17 - GF1_NAOC_4050 - - Initiate the burn with OCT11 and OCT22 thruster

Thruster burn between 02:05:17 and 02:08:43

02:08:43 - GF1_NAOC_4060 - Disable OCT driver and perform OCT mech check

02:09:23 - GF1_NAOC_2300 - Transition from OCM to NOM

02:11:53 - GF1_NPUS_7100 - Set rate of SPID 21112 (SID 36) to the default rate of 1/6 Hz

02:12:13 - GF1_NAOC_4150 - Rotate S/C of 180 deg (yaw) - ASP60650 = 3.14159

02:43:43 - GF1_NAOC_7111 - Thruster and NOM Ctrl parameters [set-4] to DPG

2024-07-16 An in-plane maneuver to restore the original formation (after the collision avoidance maneuver on GF1) was performed today on GF2.

GRACE-D The maneuver was executed at 03:47:47, duration=250sec, dV=+3.7 cm/s. - cmccullo

Full maneuver details are: - cmccullo

Execute an in-plane orbit maneuver (+0 deg yaw / flight direction) on GF2 on 2024.07.16 (DoY 198).

Maneuver input from FDS: DeltaV = 0.037195 m/s, COB = 03:49:52 UTC, 250 sec on-time BOTH OCT starting at 03:47:47 UTC

The complete SSF is based on the Ground Operations Procedure GOP_NFOS_1300 - Create a maneuver sequence:

03:32:47 - GF2_NAOC_7120 - Thruster and NOM Ctrl parameters [LEOP default] to DPG

03:43:47 - GF2_NPUS_7100 - Set rate of SPID 21112 (SID 36) to 1 Hz

03:45:17 - GF2_NAOC_2200 - Transition NOM to OCM

03:47:47 - GF2_NAOC_4050 - Initiate the burn with OCT11 and OCT22 thruster

Thruster burn between 03:47:47 and 03:51:57

03:51:57 - GF2_NAOC_4060 - Disable OCT driver and perform OCT mech check

03:52:37 - GF2_NAOC_2300 - Transition from OCM to NOM

03:55:07 - GF2_NPUS_7100 - Set rate of SPID 21112 (SID 36) to the default rate of 1/6 Hz

03:55:57 - GF2_NAOC_7111 - Thruster and NOM Ctrl parameters [set-4] to DPG

2024-07-30 GRACE-C The IPU was restarted at 09:26:19 (Finland/NSG) in order to resume the nominal output of DSP channels 39,40,41. - efahnest

GRACE-C IPU reboot (commanded) at 09:32:10 - efahnest

2024-08-08 GPS PRN 13 was disabled in the IPUs (11:30 - 01:01 2024-08-09) due to an announced period of unavailability.

2024-08-09 The IPUs on both satellites were restarted at 03:01:22 (Quebec) in order to resume tracking to all available GPS satellites. - mpaik, efahnest

GRACE-C IPU reboot (commanded) at 03:06:30

GRACE-D IPU reboot (commanded) at 03:07:00

2024-08-13 The IPU on GF2 rebooted at 14:31 over Argentina

GRACE-D IPU reboot (spontaneous) at 14:35:40

2024-08-14 LRI cavity scan was performed on both satellites at 12:00 and both LRI units were restarted at 12:38.

2024-08-15 GPS PRN 29 is disabled in the IPUs (18:45 - 2024/08/16 08:16) due to an announced period of unavailability.

2024-08-16 The IPUs on both satellites were restarted at 08:35:22 (Antarctica) in order to resume tracking to all available GPS satellites. - efahnest

GRACE-C IPU reboot (commanded) at 08:40:10 - mpaik

GRACE-D IPU reboot (commanded) at 08:40:10

2024-08-24 GRACE-C The IPU rebooted at 23:10:23 over the Sea of Okhotsk.

GRACE-C IPU reboot (spontaneous) at 23:18:40 - mpaik

2024-08-29 GRACE-C KBR Missed Interrupt autonomous restart tracker command at 18:54:12 - mpaik

GRACE-D KBR Missed Interrupt autonomous restart tracker command at 18:54:12

2024-09-03 GRACE-C KBR Missed Interrupt autonomous restart tracker command at 05:26:52 - mpaik

GRACE-D KBR Missed Interrupt autonomous restart tracker command at 05:26:52

2024-09-04 GRACE-C KBR Missed Interrupt autonomous restart tracker command at 08:16:02 - mpaik

2024-09-05 GRACE-D The IPU rebooted at 20:20:20 - over Ghana

GRACE-D IPU reboot (spontaneous) at 20:32:30 - mpaik

2024-09-06 GRACE-D KBR Missed Interrupt autonomous restart tracker command at 18:14:22 - mpaik

GRACE-C KBR Missed Interrupt autonomous restart tracker command at 21:22:10

GRACE-D KBR Missed Interrupt autonomous restart tracker command at 21:22:12

GRACE-C The IPU rebooted at 18:14:18 - central Africa

GRACE-C IPU reboot (spontaneous) at 18:18:40 - mpaik

GRACE-D The IPU rebooted at 21:26:10 - west of Guinea

GRACE-D IPU reboot (spontaneous) at 21:34:30 - mpaik

2024-09-07 GRACE-D KBR Missed Interrupt autonomous restart tracker command at 19:29:24 - mpaik

GRACE-D The IPU rebooted at 19:33:10 - Italy/Liguria

GRACE-D IPU reboot (spontaneous) at 19:40:40 - mpaik

2024-09-08 GRACE-C KBR Missed Interrupt autonomous restart tracker command at 11:02:12 - mpaik

GRACE-D KBR Missed Interrupt autonomous restart tracker command at 11:02:14

GRACE-C KBR Missed Interrupt autonomous restart tracker command at 17:19:12

GRACE-D KBR Missed Interrupt autonomous restart tracker command at 17:19:12

GRACE-C KBR Missed Interrupt autonomous restart tracker command at 19:29:20

GRACE-C The IPU rebooted at 20:30:53 - Guinea

GRACE-C IPU reboot (spontaneous) at 20:42:30 - efahnest

GRACE-D The IPU rebooted at 20:39:42 - west of Spain/Galicia

GRACE-D IPU reboot (spontaneous) at 20:45:40 - efahnest

2024-09-09 GRACE-C KBR Missed Interrupt autonomous restart tracker command at 09:00:22

GRACE-D KBR Missed Interrupt autonomous restart tracker command at 09:00:22

GRACE-C KBR Missed Interrupt autonomous restart tracker command at 12:07:30

GRACE-D KBR Missed Interrupt autonomous restart tracker command at 12:07:34

GRACE-C The IPU rebooted at 12:11:16 - South China Sea

GRACE-C IPU reboot (spontaneous) at 12:20:40 - efahnest

GRACE-D The IPU rebooted at 12:11:33 - South China Sea

GRACE-D IPU reboot (spontaneous) at 12:17:10 - efahnest

GRACE-C KBR Missed Interrupt autonomous restart tracker command at 18:25:22

GRACE-D KBR Missed Interrupt autonomous restart tracker command at 18:25:22

2024-09-10 GRACE-D KBR Missed Interrupt autonomous restart tracker command at 07:02:52

GRACE-C KBR Missed Interrupt autonomous restart tracker command at 07:02:53

GRACE-D IPU reboot (spontaneous) at 07:08:08 over North Pacific Ocean

GRACE-C The IPU rebooted at 11:51:58 over the Yellow Sea.

GRACE-C IPU reboot (spontaneous) at 11:58:10 - efahnest

GRACE-D The IPU rebooted at 21:17:44 over the North Atlantic Ocean.

GRACE-D IPU reboot (spontaneous) at 21:23:30 - efahnest

2024-09-11 GRACE-C KBR Missed Interrupt autonomous restart tracker command at 03:25:52

GRACE-D KBR Missed Interrupt autonomous restart tracker command at 03:25:52

An IPU parameter "GPS solution timeout" has been modified on both satellites. The timeout has been increased from 4 min to 20 min.

GRACE-C GPS solution timeout was modified at 12:15

GRACE-D GPS solution timeout was modified at 13:50

GRACE-C KBR Missed Interrupt autonomous restart tracker command at 19:04:32

GRACE-D KBR Missed Interrupt autonomous restart tracker command at 19:04:32

2024-09-12 GRACE-C KBR Missed Interrupt autonomous restart tracker command at 05:59:54

GRACE-D KBR Missed Interrupt autonomous restart tracker command at 05:59:54

GRACE-C KBR Missed Interrupt autonomous restart tracker command at 07:35:34

GRACE-D KBR Missed Interrupt autonomous restart tracker command at 07:35:34

GRACE-D A drift correction maneuver was performed today at 10:14:11 in OCM: duration=84sec, dV=1.26 cm/s.

Detailed maneuver information:

Execute an in-plane orbit maneuver (+0 deg yaw / flight direction) on GF2 on 2024.09.12 (DoY 256).

Maneuver input from FDS: DeltaV = 0.012578 m/s, COB = 10:14:53 UTC, 84 sec on-time BOTH OCT starting at 10:14:11 UTC

- 09:59:11 - Thruster and NOM Ctrl parameters [LEOP default] to DPG

- 10:10:11 - Set rate of SPID 21112 (SID 36) to 1 Hz

- 10:11:41 - Transition NOM to OCM

- 10:14:11 - Initiate the burn with OCT11 and OCT22 thruster

Thruster burn between 10:14:11 and 10:15:35#

- 10:15:35 - Disable OCT driver and perform OCT mech check

- 10:16:15 - Transition from OCM to NOM

- 10:18:45 - Set rate of SPID 21112 (SID 36) to the default rate of 1/6 Hz

- 10:19:35 - Thruster and NOM Ctrl parameters [set-4] to DPG

2024-09-13 GPS PRN 18 was disabled in the IPUs (01:30 - 15:01) due to an announced period of unavailability.

The IPUs on both satellites were restarted at 15:05:22 (Arabian Sea) in order to resume tracking to all available GPS satellites.

GRACE-C IPU reboot (commanded) at 15:11:10 - efahnest

GRACE-D IPU reboot (commanded) at 15:18:20 - efahnest

The Autonomous Onboard Missed Interrupt (MI) Monitor was disabled in the IPU on both satellites.

GRACE-C The MI Monitor was disabled at 12:55.

GRACE-D The MI Monitor was disabled at 19:55.

2024-09-18 GPS PRN 17 was disabled in the IPUs (19:15 - 08:46 2024-09-19) due to an announced period of unavailability. - mpaik

2024-09-19 The IPUs on both satellites were restarted at 08:50 (South Pacific Ocean) in order to resume tracking to all available GPS satellites. - mpaik

GRACE-C IPU reboot (commanded) at 08:59:50

GRACE-D IPU reboot (commanded) at 08:59:50

2024-09-27 GPS PRN 31 was disabled in the IPUs (02:45 - 16:16) due to an announced period of unavailability.

The IPUs on both satellites were restarted at 16:25 (Sudan) in order to resume tracking to all available GPS satellites - mpaik

GRACE-C IPU reboot (commanded) at 16:29:00

GRACE-D IPU reboot (commanded) at 16:29:50

2024-10-03 GPS PRN 11 was disabled in the IPUs (21:30 - 11:01 2024-10-04) due to an announced period of unavailability.

2024-10-04 The IPUs on both satellites were restarted at 11:05:22 in order to resume tracking to all available GPS satellites - mpaik

GRACE-D IPU reboot (commanded) at 11:10:10 - efahnest

GRACE-C IPU reboot (commanded) at 11:10:30 - efahnest

2024-10-15 GPS PRN 30 was disabled in the IPUs (21:30 - 11:01 2024-10-16) due to an announced period of unavailability. - mpaik

2024-10-16 The IPUs on both satellites were restarted at 11:05 (Northern Canada) in order to resume tracking to all available GPS satellites. - mpaik

GRACE-D IPU reboot (commanded) at 11:10:50

GRACE-C IPU reboot (commanded) at 11:11:00

2024-10-31 OBC Onboard SW will be checked on both satellites: - mpaik

17:01 - 21:20: CRCs of the OBCPs in EEPROM and RAM

21:24 - 21:35: CRCs of SGM

21:40 - 22:09: Event Action configuration

2024-11-12 GRACE-C The IPU rebooted at 01:42 over Congo. - mpaik

GRACE-C IPU reboot (spontaneous) at 01:47:30 - efahnest

2024-11-15 GPS PRN 19 was disabled in the IPUs (01:00 - 14:30) due to an announced period of unavailability.

The IPUs on both satellites were restarted at 14:32 (South Pacific Ocean) in order to resume tracking to all available GPS satellites. - efahnest

GRACE-D IPU reboot (commanded) at 14:37:10 - mpaik

GRACE-C IPU reboot (commanded) at 14:37:40

2024-11-18 GRACE-D The IPU rebooted at 06:49 east of Argentina. - efahnest

GRACE-D IPU reboot (spontaneous) at 06:53:20

2024-11-20 GPS PRN 12 was disabled in the IPUs (20:15 - 09:46 2024-11-21) due to an announced period of unavailability. - cvolk

2024-11-21 The IPUs on both satellites were restarted at 09:47:22 (Gulf of California) in order to resume tracking to all available GPS satellites.

GRACE-D IPU reboot (commanded) at 09:52:20

GRACE-C IPU reboot (commanded) at 09:56:40

2024-11-27 GPS PRN 06 was announced unusable. - mpaik

GRACE-C GPS PRN 06 was disabled in the IPU at 14:11.

GRACE-D GPS PRN 06 was disabled in the IPU at 16:50.

2024-11-29 GPS PRN 06 was enabled in the IPUS at 08:15 after a short period of unavailability. - mpaik

The IPUs on both satellites were restarted at 08:16 (Indian Ocean) in order to resume tracking to all available GPS satellites.

GRACE-C IPU reboot (commanded) at 08:22:30

GRACE-D IPU reboot (commanded) at 08:29:20

2024-12-04 A Constellation Correction Maneuver was executed on GF2 which consisted of:

- an in-plane component to perform a drift correction relative to GF1

- an out-of-plane component to correct the drift of the relative inclination

MWI measurements were interrupted from 04:22 to 04:45.

Execute a combination of in-plane and out-of-plane orbit maneuver with a yaw angle of -0.83798 rad (-48.013 deg) on GF2 on 2024.12.04 (DoY 339).

Maneuver input from FDS: DeltaV = 2.1526 cm/s, COB = 04:38:00 UTC, 144 sec on-time BOTH OCT starting at 04:36:48 UTC

04:01:48 - GF2_NAOC_7120 - Thruster and NOM Ctrl parameters [LEOP default] to DPG

04:16:48 - GF2_NAOC_2200 - Transition NOM to OCM

04:19:48 - GF2_NAOC_6012 - AOCS Attitude Slew by -48deg commanded in OCM

04:36:48 - GF2_NAOC_4050 - Initiate the burn with OCT11 and OCT22 thruster

Thruster burn between 04:36:48 and 04:39:12

04:39:12 - GF2_NAOC_4060 - Disable OCT driver and perform OCT mech check

04:39:52 - GF2_NAOC_6012 - AOCS Attitude Slew back to the nominal attitude commanded in OCM

04:56:12 - GF2_NAOC_2300 - Transition from OCM to NOM

04:59:12 - GF2_NAOC_7111 - Thruster and NOM Ctrl parameters [set-4] to DPG

2024-12-06 GPS PRN 07 was disabled in the IPUs (03:00 - 16:31) due to an announced outage.

GRACE-C The IPU rebooted at 14:03:25 over Antarctica. - efahnest

IPU reboot (spontaneous) at 14:10:20

The IPUs on both satellites were restarted at 16:35 (Korea Strait) in order to resume tracking to all available GPS satellites. - efahnest

GRACE-C IPU reboot (commanded) at 16:46:40

GRACE-D The commanded IPU reboot was not performed due to nudge timeout. - mpaik

GRACE-D The IPU rebooted at 16:51 over Western Australia, shortly after the scheduled restart. - mpaik

IPU reboot (spontaneous) at 16:57:30

2024-12-09 GPS PRN 21 has been announced unusable from 09-Dec through 19-Dec and was disabled in the IPUs at 16:30. - mpaik

Four LRI reboots were commanded 16:30 - 16:40 in order to validate all four flight software images.

2024-12-12 An in-plane maneuver to minimize the risk of collision with the satellite SKYKRAFT-3D was successfully performed on GF2. - mpaik

GRACE-D The maneuver was executed at 11:56:49: duration=201sec, dV=3 cm/s.

Execute an in-plane orbit maneuver (+0 deg yaw / flight direction) on GF2 on 2024.12.12 (DoY 347).

Maneuver input from FDS: DeltaV = 3.0 cm/s, COB = 11:58:30 UTC, 201 sec on-time BOTH OCTs starting at 11:56:49 UTC

11:41:49 - GF2_NAOC_7120 - Thruster and NOM Ctrl parameters [LEOP default] to DPG

11:54:19 - Transition NOM to OCM

11:56:49 - Initiate the burn with OCT11 and OCT22 thruster

Thruster burn between 11:56:49 and 12:00:10

12:00:10 - Disable OCT driver and perform OCT mech check

12:00:50 - Transition from OCM to NOM

12:04:10 - GF2_NAOC_7111 - Thruster and NOM Ctrl parameters [set-4] to DPG

2024-12-14 A constellation correction maneuver was performed on GF2. Science operations were interrupted from 08:42 to 09:55. - mpaik

GRACE-D The maneuver was executed at 09:17:25: duration=213sec, dV=3.2 cm/s.

Execute an in-plane orbit maneuver (180 deg yaw / anti-flight direction) on GF2 on 2024.12.14 (DoY 349).

Maneuver input from FDS: DeltaV = 3.1729 cm/s, COB = 09:19:11 UTC, 213 sec on-time BOTH OCT starting at 09:17:25 UTC

08:32:25 - GF2_NAOC_7120 - Thruster and NOM Ctrl parameters [LEOP default] to DPG

08:42:25 - Rotate S/C of 180 deg (yaw)

09:14:55 - Transition NOM to OCM

09:17:25 - Initiate the burn with OCT11 and OCT22 thruster

Thruster burn between 09:17:25 and 09:20:58

09:20:58 - Disable OCT driver and perform OCT mech check

09:21:38 - Transition from OCM to NOM

09:24:28 - Rotate S/C of 180 deg (yaw)

09:55:58 - GF2_NAOC_7111 - Thruster and NOM Ctrl parameters [set-4] to DPG

2024-12-17 GPS PRN 21 was enabled in the IPUs at 05:30 at after it was announced as usable again.

The IPUs on both satellites were restarted at 05:31:22 (Antarctica) in order to resume tracking all available GPS satellites.

GRACE-D IPU reboot (commanded) at 05:35:50

GRACE-C IPU reboot (commanded) at 05:36:00

2024-12-18 GPS PRN 09 was disabled in the IPUs (13:45 - 03:16 2024-12-19) due to an announced outage.

2024-12-19 The IPUs on both satellites were restarted at 03:20:22 (New Guinea) in order to resume tracking to all available GPS satellites.

GRACE-D IPU reboot (commanded) at 03:28:10 - efahnest

GRACE-C IPU reboot (commanded) at 03:31:00 - efahnest

2024-12-23 GPS PRN 09 was disabled in the IPUs (13:45 - 2024-12-24 03:16) due to an announced outage.

2024-12-24 The IPUs on both satellites were restarted at 03:30 (Southern Ocean) in order to resume tracking to all available GPS satellites.

GRACE-C IPU reboot (commanded) at 03:35:50

A Ka missed interrupt occurred at approximately 06:30

GRACE-D IPU reboot (commanded) at 03:37:20

2024-12-25 GRACE-C A restart tracker command was sent at 04:34:03 to cure the missed interrupt. - cmccullo

2024-12-31 The GF2 IPU rebooted at 22:06:00 over Antarctica. - efahnest

GRACE-D IPU reboot (spontaneous) at 22:11:20 - efahnest

2025-01-09 GPS PRN 10 was disabled in the IPUs (08:15 - 21:46 2025-01-10) due to an announced outage. - mpaik

2025-01-10 The IPUs on both satellites were restarted at 03:05 (Antarctica) in order to resume tracking to all available GPS satellites.

GRACE-D IPU reboot (commanded) at 03:09:10 - mpaik

GRACE-C IPU reboot (commanded) at 03:09:50

2025-01-20 GRACE-C KBR1A has a time gap of 30.1 seconds due to a missed interrupt. - mpaik

2025-01-23 GPS PRN 21 was announced unusable until further notice and disabled in the IPUs at 17:30. - mpaik

2025-01-24 GPS PRNs 01 and 22 were announced usable again and were re-enabled in the IPUs at 08:00. - mpaik

The IPUs on both satellites were restarted at 08:05:22 (North Pacific Ocean) in order to resume tracking all available GPS satellites.

GRACE-C IPU reboot (commanded) at 08:10:50 - mpaik

GRACE-D IPU reboot (commanded) at 08:10:50

2025-01-30 GPS PRN 28 was disabled in the IPUs (23:15 - 12:46 2025-01-31) due to an announced outage. In the meantime, the outage was rescheduled to 2025-02-05.

2025-01-31 The IPUs on both satellites were restarted at 12:50:22 (South Indian Ocean). - efahnest

Then the GF2 IPU rebooted at 13:06:20 over Antarctica, shortly after the scheduled restart. - efahnest

GRACE-C IPU reboot (commanded) at 12:56:00 - efahnest

GRACE-D IPU reboot (commanded) at 12:56:00 - efahnest

GRACE-D IPU reboot (spontaneous) at 13:11:50 - efahnest

2025-02-04 GPS PRN 28 was disabled in the IPUs (22:45 - 12:16 2025-02-05) due to an announced outage. -efahnest

2025-02-05 The IPUs on both satellites were restarted at 12:35:22 (North Atlantic Ocean) in order to resume tracking all available GPS satellites. -efahnest

GRACE-C IPU reboot (commanded) at 12:40:50 - mpaik

GRACE-D IPU reboot (commanded) at 12:40:50

2025-02-07 GPS PRN 02 was disabled in the IPUs (00:45 - 2025-02-8 02:16) due to an announced outage. - mpaik

2025-02-08 The IPUs on both satellites were restarted at 03:01 (Indian Ocean) in order to resume tracking to all available GPS satellites. - mpaik

GRACE-C IPU reboot (commanded) at 03:04:40

GRACE-D IPU reboot (commanded) at 03:04:50

2025-02-11 GRACE-D A drift correction maneuver was performed today at 08:50:29 in OCM: duration=103sec, dV=1.54 cm/s.

Execute an in-plane orbit maneuver (+0 deg yaw / flight direction) on GF2 on 2025.02.11 (DoY 042).

Maneuver input from FDS: DeltaV = 0.015404 m/s, COB = 08:51:21 UTC, 103 sec on-time BOTH OCT starting at 08:50:29 UTC

Maneuver sequence:

08:35:29 - GF2_NAOC_7120 - Thruster and NOM Ctrl parameters [LEOP default] to DPG

08:46:29 - GF2_NPUS_7100 - Set rate of SPID 21112 (SID 36) to 1 Hz

08:47:59 - GF2_NAOC_2200 - Transition NOM to OCM

08:50:29 - GF2_NAOC_4050 - Initiate the burn with OCT11 and OCT22 thruster

Thruster burn between 08:50:29 and 08:52:12#

08:52:12 - GF2_NAOC_4060 - Disable OCT driver and perform OCT mech check

08:52:52 - GF2_NAOC_2300 - Transition from OCM to NOM

08:55:22 - GF2_NPUS_7100 - Set rate of SPID 21112 (SID 36) to the default rate of 1/6 Hz

08:56:12 - GF2_NAOC_7111 - Thruster and NOM Ctrl parameters [set-4] to DPG

2025-02-12 GPS PRN 32 was disabled in the IPUs (12:45 - 02:16 2025-02-13) due to an announced outage.

2025-02-13 The IPUs on both satellites were restarted at 03:01:22 (Eastern Pacific) in order to resume tracking to all available GPS satellites.

GRACE-D IPU reboot (commanded) at 03:05:50 - efahnest

GRACE-C IPU reboot (commanded) at 03:06:00 - efahnest

GRACE-C KBR Missed Interrupt occurred at 03:43:17

GRACE-C KBR Missed Interrupt occurred at 09:20:49

GRACE-C KBR Missed Interrupt occurred at 10:30:41

GRACE-C KBR Missed Interrupt occurred at 11:27:57

GRACE-C KBR Missed Interrupt occurred at 14:15:32

GRACE-C KBR Missed Interrupt occurred at 15:24:35

GRACE-C KBR Missed Interrupt occurred at 16:06:55

GRACE-C KBR Missed Interrupt occurred at 17:12:32

GRACE-C RestartTracker command was sent at 19:59, which resolved the missed interrupts

2025-03-05 GPS PRN 08 has been announced unusable until further notice and will be disabled in the IPUs. - mpaik

GRACE-C GPS PRN 08 was disabled at the OHG contact at 22:53.

GRACE-D GPS PRN 08 was disabled at the OHG contact at 21:21.

2025-03-06 GPS PRN 06 was disabled in the IPUs (18:15 - 07:46 2025-03-07) due to an announced outage. In the meantime, the outage has been rescheduled to 11/12-Mar.

2025-03-07 The IPUs on both satellites were restarted at 07:50 (South Pacific Ocean) in order to resume tracking to all available GPS satellites. - mpaik

GRACE-D IPU reboot (commanded) at 07:55:40

GRACE-C IPU reboot (commanded) at 07:56:50

2025-03-11 GPS PRN 06 was disabled in the IPUs (18:15 - 07:46 2025-03-12) due to an announced outage.

2025-03-12 The IPUs on both satellites were restarted at 07:47:22 (near North Pole) in order to resume tracking to all available GPS satellites. - efahnest

GRACE-C IPU reboot (commanded) at 07:51:40

GRACE-D IPU reboot (commanded) at 07:51:40

GPS PRN 08 has been announced usable again and will be re-enabled in the IPUs at 2025-03-13 05:44.

2025-03-13 The IPUs on both satellites were restarted at 05:45:22 (Arctic Ocean) in order to resume tracking to all available GPS satellites. - efahnest

GRACE-C IPU reboot (commanded) at 05:50:10

GRACE-D IPU reboot (commanded) at 05:51:30

2025-03-27 The autonomous Missed Interrupt (MI) handling was enabled in the IPUs with the floor level set to 0.19 cycle.

GRACE-C The MI monitor was enabled at 08:50.

GRACE-D The MI monitor was enabled at 15:55.

2025-04-03 GPS PRN 02 was disabled in the IPUs (19:15 - 20:46 2025-04-04) due to an announced outage. - mpaik

2025-04-04 The IPUs on both satellites were restarted at 20:47:22 (South China Sea) in order to resume tracking to all available GPS satellites. - mpaik

GRACE-C IPU reboot (commanded) at 20:52:50 - efahnest

GRACE-D IPU reboot (commanded) at 20:52:50 - efahnest

GRACE-C IPU reboot (spontaneous) at 21:02:20 - efahnest

2025-04-17 GPS PRN 26 was disabled in the IPUs (11:15 - 00:46 2025-04-18) due to an announced outage. - efahnest

GPS PRN 15 was disabled in the IPUs (19:30 - 09:01 2025-04-18) due to an announced outage. - efahnest

2025-04-18 The IPUs on both satellites were restarted at 09:02 (Ontario, Canada) in order to resume tracking to all available GPS satellites. - efahnest

GRACE-C IPU reboot (commanded) at 09:07:20 - mpaik

GRACE-D IPU reboot (commanded) at 09:07:30

A Missed Interrupt occurred at 09:12. A RestartTracker Command was executed at 15:33, which successfully corrected the issue. - mpaik

GRACE-C KBR Missed Interrupt occurred at 13:50:12

GRACE-C KBR Missed Interrupt occurred at 15:36:43

2025-04-23 GPS PRN 05 was disabled in the IPUs (03:30 - 17:01 2025-04-24) due to an announced outage. - mpaik

2025-04-24 The IPUs on both satellites were restarted at 17:05 (Arctic Ocean) in order to resume tracking to all available GPS satellites. - mpaik

GRACE-D IPU reboot (commanded) at 17:09:40 - mpaik

GRACE-C IPU reboot (commanded) at 17:10:10

2025-05-01 The IPU on GF1 rebooted at 22:46 over the Barents Sea. - efahnest

GRACE-C IPU reboot (spontaneous) at 22:50:30 - mpaik

2025-05-02 GPS PRN 03 was disabled in the IPUs (01:45 - 15:16) due to an announced outage. - efahnest

The IPUs on both satellites were restarted at 15:20:22 (Antarctica) in order to resume tracking to all available GPS satellites.

GRACE-D IPU reboot (commanded) at 15:25:40 - mpaik

GRACE-C IPU reboot (commanded) at 15:28:00

2025-05-08 GPS PRN 08 was disabled in the IPUs (18:30 - 08:01 2025-05-09) due to an announced outage.

The IPU on GF2 rebooted at 18:10 over Argentina - efahnest

GRACE-D IPU reboot (spontaneous) at 18:14:00 - efahnest

2025-05-09 The IPUs on both satellites were restarted at 08:02:22 (Bay of Bengal) in order to resume tracking to all available GPS satellites. - efahnest

GRACE-C IPU reboot (commanded) at 08:06:20

GRACE-D IPU reboot (commanded) at 08:13:30

GRACE-D The outage of GPS PRN 08 was extended, so it was disabled in the GF2 IPU (14:04 - 15:56 2025-05-10)

2025-05-10 GRACE-D The IPU on GF2 was restarted at 16:00:22 East of Tasmania - efahnest

IPU reboot (commanded) at 16:05:20

2025-05-15 GRACE-C The command to enable PRN 08 on 9-May was unsuccessful. Therefore PRN 08 was re-enabled at 17:59 and the IPU was restarted at 18:00:22 over the Southern Ocean.

IPU reboot (commanded) at 18:10:50 - mpaik

GRACE-C KBR Missed Interrupt autonomous restart tracker command at 20:24:54 - mpaik

2025-05-23 GPS PRN 11 has been announced unusable until further notice and was disabled in the IPUs. - mpaik

GRACE-C GPS PRN 11 was disabled at the next OHG contact at 16:40.

GRACE-D GPS PRN 11 was disabled at the next OHG contact at 18:15.

2025-05-27 GPS PRN 11 was enabled in the IPUs at 04:29.

The IPUs on both satellites were restarted at 04:30:22 (Greenland/Baffin Bay) in order to resume tracking to all available GPS satellites. - mpaik

GRACE-C IPU reboot (commanded) at 04:35:40 - mpaik

GRACE-D IPU reboot (commanded) at 04:35:40

2025-06-02 The IPU on GF2 rebooted at 23:05:09 over Libya. - efahnest

GRACE-D IPU reboot (spontaneous) at 23:09:40 - efahnest

2025-06-04 An out-of-plane constellation correction maneuver was executed on GF2 to correct:

drift of relative inclination

drift rate between the two satellites

MWI measurements were interrupted from 02:52 to 03:16.

Maneuver input: DeltaV = 1.5976 cm/s, COB = 03:10:00 UTC with 107 sec on-time starting at 03:09:06 UTC

The orbit correction maneuver was executed in OCM mode:

02:34:06 thruster and NOM Ctrl parameters to DPG

02:49:96 transition NOM to OCM

02:52:06 attitude slew by -34deg

03:09:06 OCM thrusters were activated for 107sec providing dV=1.6cm/s

03:11:33 slew-back to the nominal attitude

03:27:53 transition OCM to NOM

03:30:53 thruster and NOM Ctrl parameters to DPG

GRACEC restart tracker command at 2025-06-04 02:54:44

GRACED restart tracker command at 2025-06-04 02:55:13

GRACEC restart tracker command at 2025-06-04 03:14:24

GRACED restart tracker command at 2025-06-04 03:14:24

GPS PRN 29 was disabled in the IPUs (14:00 - 03:31 2025-06-05) due to an announced outage.

2025-06-05 The IPUs on both satellites were restarted at 03:32:22 (Indian Ocean) in order to resume tracking to all available GPS satellites.

GRACE-C IPU reboot (commanded) at 03:37:00 - mpaik

GRACE-D IPU reboot (commanded) at 03:38:40

2025-06-11 GPS PRN 26 was disabled in the IPUs at 23:30, due to period of unavailability. - mpaik

2025-06-18 An in-plane maneuver to minimize the risk of collision with another satellite was performed today on GF1.

Science operations were interrupted from 14:50 to 16:00

The maneuver was executed at 15:26:46, duration=69sec, dV=+1.0 cm/s.

14:41:46 - Thruster and NOM Ctrl parameters [LEOP default] to DPG

14:51:46 - Rotate S/C of 180 deg (yaw)

15:24:16 - Transition NOM to OCM

15:26:46 - - Initiate the burn with OCT11 and OCT22 thruster

Thruster burn between 15:26:46 and 15:27:55

15:27:55 - Disable OCT driver and perform OCT mech check

15:28:35 - Transition from OCM to NOM

15:31:25 - Rotate S/C of 180 deg (yaw)

16:02:55 - Thruster and NOM Ctrl parameters [set-4] to DPG

GRACEC restart tracker command at 2025-06-18 14:54:42

GRACED restart tracker command at 2025-06-18 14:56:42

GRACED restart tracker command at 2025-06-18 15:46:54

2025-06-21 A constellation correction maneuver was performed on GF2.

The maneuver was executed at 10:36:58, duration=74 sec, dV=1.1 cm/s.

10:21:58 - Thruster and NOM Ctrl parameters [LEOP default] to DPG

10:34:28 - Transition NOM to OCM

10:36:58 - Initiate the burn with OCT11 and OCT22 thruster

Thruster burn between 10:36:58 and 10:38:12

10:38:12 - Disable OCT driver and perform OCT mech check

10:38:52 - Transition from OCM to NOM

10:42:12 - Thruster and NOM Ctrl parameters [set-4] to DPG

2025-06-22 The IPU on GF1 rebooted at 21:33:22 over the Southern Ocean. - mpaik

GRACE-C IPU reboot (spontaneous) at 21:38:10

2025-06-26 GPS PRN 26 was re-enabled in the IPUs at 01:01. - mpaik

The IPUs on both satellites were restarted at 03:05 (Mongolia) in order to resume tracking all available GPS satellites.

GRACE-C IPU reboot (commanded) at 03:09:40

GRACE-D IPU reboot (commanded) at 03:09:40

GPS PRN 21 has been announced usable again and was enabled in the IPUs at 16:10. - mpaik

The IPUs on both satellites were restarted at 16:15:22 (Antarctica) in order to resume tracking all available GPS satellites.

GRACE-D IPU reboot (commanded) at 16:19:00

GRACE-C IPU reboot (commanded) at 16:19:30

2025-07-02 GRACE-D The lower FDIR limit for gas tank pressure was changed from 185 bar to 165 bar at 09:15.

2025-07-03 GPS PRN 20 was disabled in the IPUs (17:45 - 07:16 2025-07-04) due to an announced outage.

GRACE-C The lower FDIR limit for gas tank pressure was changed from 185 bar to 165 bar at 07:10.

2025-07-04 The IPUs on both satellites were restarted at 07:17:22 (South Pole) in order to resume tracking to all available GPS satellites.

GRACE-C IPU reboot (commanded) at 07:22:10

GRACE-D IPU reboot (commanded) at 07:22:40

2025-07-10 GPS PRN 27 was disabled in the IPUs (02:45 - 16:16) due to an announced outage. - mpaik

The IPUs on both satellites were restarted at 16:17 (East Pacific Ocean) in order to resume tracking to all available GPS satellites.

GRACE-C IPU reboot (commanded) at 16:22:20

GRACE-D IPU reboot (commanded) at 16:26:10

2025-07-27 The IPU on GF2 rebooted at 23:39:50 over Brazil. - efahnest

GRACE-D IPU reboot (spontaneous) at 23:45:40

2025-07-31 GPS PRN 14 was disabled in the IPUs (06:30 - 20:01) due to an announced outage. - efahnest

The IPUs on both satellites were restarted at 20:05:22 (Mauritania) in order to resume tracking to all available GPS satellites.

GRACE-C IPU reboot (commanded) at 20:10:00

GRACE-D IPU reboot (commanded) at 20:10:30

2025-08-04 GPS PRN 20 was announced unusable until further notice and was disabled in the IPUs. - efahnest

GRACE-C GPS PRN 20 was disabled at 18:03

GRACE-D GPS PRN 20 was disabled at 19:39

2025-08-06 GRACE-D KBR Missed Interrupt occurred at 20:40:36.25 - efahnest

2025-08-07 GRACE-D A RestartTracker command was sent at 07:27:09. - mpaik

2025-08-13 The IPU on GF2 rebooted at 02:50:32 over the Strait of Hormuz. - efahnest

GRACE-D IPU reboot (spontaneous) at 02:55:20

2025-08-18 GPS PRN 4 was disabled in both satellites after a period of unavailability was announced. - mpaik

2025-08-20 GRACE-D The IPU rebooted at 21:50:20 over Bolivia. - mpaik

GRACE-D IPU reboot (spontaneous) at 22:02:10

2025-08-25 GPS PRN 4 was enabled in the IPUs of both satellites after its usability was announced.

2025-08-27 GPS PRN 01 was disabled in the IPUs (18:15 - 07:46 2025-08-28) due to an announced outage. - efahnest

2025-08-28 The IPUs on both satellites were restarted at 07:50:22 (Antarctica) in order to resume tracking to all available GPS satellites. - efahnest

GRACE-C IPU reboot (commanded) at 07:54:30

GRACE-D IPU reboot (commanded) at 07:55:10

2025-09-02 GPS PRN 01 was disabled in the IPUs due to an announced outage. - mpaik

GRACE-C PRN 01 was disabled from 19:30 through 07:31 2025-09-03.

GRACE-D PRN 01 was disabled from 18:00 through 07:31 2025-09-03.

GRACE-D The lower FDIR limit for gas tank pressure (165 bar) was saved in the SGM EEPROM.

At 01:00 the jamming & geometry gets so bad that the number of GPS tracked drops to below 4 for 10 minutes (and the GPS that remain tracked have bottom-of-the-barrel SNRs). - Mark

2025-09-03 The IPUs on both satellites were restarted at 07:40:22 (south of South Georgia) in order to resume tracking to all available GPS satellites.

GRACE-C IPU reboot (commanded) at 07:44:20 - mpaik

GRACE-D IPU reboot (commanded) at 07:46:00

2025-09-04 GPS PRN 16 was disabled in the IPUs (19:30 - 09:01 2025-09-05) due to an announced outage. - mpaik

2025-09-05 The IPUs on both satellites were restarted at 09:05:22 (North Pole) in order to resume tracking to all available GPS satellites. - mpaik

GRACE-C IPU reboot (commanded) at 09:09:20

GRACE-D IPU reboot (commanded) at 09:11:30

2025-09-06 GRACE-D A time gap in GNV1A occurred at 00:53:56 due to a drop in the number of tracked GPS satellites.

Everything recovered before the 20 minute timeout so there is no IPU reboot. - cmccullo

2025-09-24 GRACE-D The lower FDIR limit for gas tank pressure (165 bar) was saved in the SGM EEPROM today.

2025-09-26 GRACE-C in-plane collision avoidance maneuver to minimize the risk of collision with the satellite GHOST-4 was performed.

Science operations were interrupted from 20:34 to 21:35.

The maneuver was planned to be executed at 21:08:51, duration=137sec, dV=+2.0 cm/s.

Maneuver input from FDS: 0.02 m/s, 137 sec on-time both OCT starting at 21:08:51 UTC

Maneuver details:

20:23:51 - Thruster and NOM Ctrl parameters changed

20:33:51 - Rotate S/C of 180 deg (yaw)

21:06:21 - Transition NOM to OCM

21:08:51 - Initiate the burn with OCT11 and OCT22 thruster

Thruster burn between 21:08:51 and 21:11:08

21:11:48 - Transition from OCM to NOM

21:14:38 - Rotate S/C of 180 deg (yaw)

21:46:08 - Thruster and NOM Ctrl parameters changed

GRACE-C autonomous KBR restart tracker command at 20:36:54, 20:39:54, and 20:41:42 - mpaik

GRACE-D autonomous KBR restart tracker command at 20:36:54, 20:38:52, and 21:30:22

2025-09-30 GRACE-D two constellation correction maneuvers were performed to correct: - mpaik

- the drift rate between the two satellites

- the relative eccentricity and the drift of the relative inclination

The first maneuver was planned to be executed in-plane at 03:18:36: duration=168sec, dV=2.5 cm/s.

The second maneuver was planned to be a mixed in-plane/out-of-plane maneuver at a yaw angle of -11 deg, executed at 03:59:25: duration=70sec, dV=1.0492 cm/s.

1st maneuver input: 2.5 cm/s, 168 sec on-time both OCT starting at 03:18:36

1st maneuver details:

03:03:36 - Thruster and NOM Ctrl parameters changed

03:16:06 - Transition NOM to OCM

03:18:36 - Initiate the burn with OCT11 and OCT22 thruster

Thruster burn between 03:18:36 and 03:21:24

03:22:14 - Transition from OCM to NOM

2nd maneuver input: 1.0492 cm/s, 70 sec on-time both OCT starting at 03:59:25 UTC

2nd maneuver details:

03:39:25 - Transition NOM to OCM

03:42:25 - AOCS Attitude Slew in OCM

03:59:25 - Initiate the burn with OCT11 and OCT22 thruster

Thruster burn between 03:59:25 and 04:00:35

04:01:15 - AOCS Attitude Slew in OCM

04:17:45 - Transition from OCM to NOM

04:20:45 - Thruster and NOM Ctrl parameters changed

2025-10-02 GPS PRN 25 was disabled in the IPUs (20:45 - 2025-10-03 10:16) due to an announced outage. - mpaik

2025-10-03 The IPUs on both satellites were restarted at 10:21 (South Pacific Ocean) in order to resume tracking to all available GPS satellites. - mpaik

GRACE-C IPU reboot (commanded) at 10:26:00

GRACE-D IPU reboot (commanded) at 10:31:30

2025-10-06 GPS PRN 01 was announced unusable until further notice and was disabled in the IPUs.

GRACE-C GPS PRN 20 was disabled at 14:05.

GRACE-D GPS PRN 20 was disabled at 12:34.

2025-10-07 GPS PRN 01 was announced usable again and was enabled in the IPUs at 19:42.

The IPUs on both satellites were restarted at 19:47:22 (Florida) in order to resume tracking to all available GPS satellites.

GRACE-C IPU reboot (commanded) at 19:52:30

GRACE-D IPU reboot (commanded) at 19:53:00

2025-10-09 GPS PRN 20 was announced usable again and was re-enabled in the IPUs at 20:10. - efahnest

The IPUs on both satellites were restarted at 20:15:22 (Gulf of Mexico) in order to resume tracking all available GPS satellites. -- efahnest

GRACE-C IPU reboot (commanded) at 20:20:50

GRACE-D IPU reboot (commanded) at 20:21:40

2025-10-16 GPS PRN 04 was disabled in the IPUs (16:45 - 2025-10-17 06:16) due to an announced outage. - efahnest

2025-10-17 GPS PRN 04 was announced usable again and was re-enabled in the IPUs at 06:16. - efahnest

The IPUs on both satellites were restarted at 06:21:22 (East Indian Ocean) in order to resume tracking all available GPS satellites. -- efahnest

GRACE-C IPU reboot (commanded) at 06:27:00 - mpaik

GRACE-D IPU reboot (commanded) at 06:30:40

2025-11-06 The IPU rebooted at 15:45:57 over Paraguay. - mpaik

GRACE-C IPU reboot (spontaneous) at 15:58:00

2025-11-07 The IPU rebooted this morning at 10:51:31 over Poland. - mpaik

GRACE-D IPU reboot (spontaneous) at 10:58:40