ICESat-2 PROJECT SCIENCE OFFICE REPORT
Monday, October 14, 2019 thru Sunday, October 20, 2019

RGTs spanned: 262-368
Cycle 5

SUMMARY:
All ATLAS housekeeping data is nominal; laser 2 is firing at energy level 4 and in science mode. SIPS installed SIPS Build 4.2.2 (ASAS V5.2.2 patch) on OPS and reprocessed all failed rapid R002 ATL03s from September 30, 2019 onwards, and all runs were successfully completed and products distributed to the SCF and internal project science office data storage systems. Preparations are underway for the biannual meeting of the ICESat-2 science team, being held at the University of Washington in two weeks.

NSIDC ICESat-2 Metrics through October 20: 1,821 total users of 10 available data products; 1,163,743 sciences files downloaded. ATL08 is back in the lead with 664 users and 407,978 files downloaded! ATL03 has been demoted to 2nd place with 636 users of 129,897 files, and ATL06 is in 3rd this week with 505 users and an astounding 526,163 files downloaded.

Photon Phriday featured an interesting pass over the Rhine River and a lock/dam system just south of Strasbourg, France.

ELEMENT DETAILS BELOW

CAMS/POD:
CAMS: Regular CAMS operations: constraint and conjunction monitoring for mission weeks 57 and 58, and mission planning for mission week 59.
A laser conjunction was identified for DOY288(MW57), CAMS provided a negative 5deg slew SAT to the ISF for the HIE event with LEMUR2-Alexander (43559). The HIE subsequently self-mitigated.

POD: Regular POD operations continue. Intermediate POD was completed for GPS week 2074. Final POD was completed for GPS week 2072. All results appear nominal.

ISF:
All ATLAS housekeeping data is nominal
Laser 2 is firing at energy level 4 and in science mode
WTEM Peak to Edge Ratio: 1.197
Laser 2 Temperature Error: -0.32C
SADA in Airplane Mode
Spacecraft orientation: + X

Mission Planning:
MW58 ATS is loaded to the spacecraft and currently operating

MW59 is being planned, nominal calibration activities, and the v9 Algorithm parameters test.
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Activities during the past week:

Real-time activities:

Executed sCAR91 to clear routine SBS errors
Continued training new ISF operator - Daniel.

ATS activities:
Routine calibration activities.
Due to ICESat-2 uplink issues the Mission Week 58 ATS was enabled at 06:30 UTC 2019/290. The delayed uplink meant we were unable to execute 8 vegetation tracks, and 6 routine instrument calibration activities which were to have taken place between 00:00-06:30. The PSO MW058 list attached reflects what was executed onboard.

Other Activities:
Set the NOGO/GO ILRS flags around DMU29 2019/290.

Near-term activities:
Continuing to work on the ISF tech refresh

Notes/Issues:
ISF had to switch our routine trending and file processing from the primary server, isfop1 to the redundant server, isfop2, due to what appears to be a failing disk on ops1. The failover was completed mid-week and there were no impacts beyond some internal delays of file transfers and similar issues.

LTO Schedule:
All items remain on schedule

SIPS:

The SIPS is operating nominally:

- Ingested and distributed Level 0 data to the ISF.
- Generated L1A and L1B products and distributed ATL02s to the ISF, POD, and SCF.
- Distributed selected ATL01s to the ISF and SCF by special request.
- Generated rapids ATL03 using ANC03/04/05 files from the CAMS.
- Distributed ATL03 (rapids) to the SCF.

· Completed processing Batch 3 (Dec. 01, 2018 – May 03, 2019) Release 002 products

· Distributed Release 002 ATL04, ATL07, ATL09, ATL10, ATL12 and ATL13 products to NSIDC for DOY 124-177, 2019 and DOY 287-335, 2018.
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- Installed SIPS Build 4.2.2 (ASAS V5.2.2 patch) on OPS and reprocessed all failed rapid R002 ATL03s from September 30, 2019 onwards.
  - All runs were successfully completed and products distributed to the SCF and Cooler.

ASAS:

ASAS developers continue to work the top priority issues as identified by their respective ATBD lead.

ASAS is beginning to evaluate the first post-release 2.0 functional testing data. These data are labelled '953a1' and time spans from October 2018, November 2018 and February 2019.

The re-worked HDF5 product designer is being used by the ASAS team to perform product modifications.

ASAS is providing support towards the analysis of range bias data.

ASAS is providing support in regards to 'fixing' the July data where incorrect leap seconds were uploaded to the SC after the safehold. Current thinking is that ASAS cannot fix this alone, but must fix the time issue in conjunction with POD/PPD.

ATL16/17s that cross cycle boundaries breaks an ASAS assumption that products would not cross cycle boundaries. Code is being revised to handle this case.

L2/L3 atmosphere work continues with the testing of CAL method 3. The developer reports that improved DDA results compare well with results from science team code .

The atmosphere L3B developer is adding code to compute the number of observed points.

The sea ice/freeboard developer has fixed a case that caused NaN values on ATL10 and is working on the L3B products.

The Land Ice ATL11 L3B code is being modified to work in a production environment. The developer is currently implementing coordinate projection conversions for the ICESat-2 surface type mask.

The inland water developer is working on modifying the shape buffer as a function of body/type size.

The ocean developer continues the redesign of the ocean manager.

SCF:

The SCF is operating nominally. Data for releases 002, R002, and 001 are being ingested and distributed, and all subscriptions are current. The first ATL16 and ATL17 data products (release

001) have arrived at the SCF. Visualizer apps have been made and are being tested before release, planned for early next week. A file listing the current SCF data holdings is attached.

* Data Management -- Running smoothly overall. ATL16 and ATL17 have started arriving and are showing up in transaction trending reports, an initial indication that they are being handled correctly by our scripts. We will monitor things to ensure there are no issues with the new products. The operational server will be down for maintenance on Tuesday, October 22; we expect to catch up with processing relatively quickly once maintenance is complete.

* Subsetter -- Also running as expected; nothing major to report this week.

* Visualizer -- The code has been frozen and stand-alone apps have been made for Windows, Ubuntu Linux, and Mac OS X. We expect to complete testing of the apps and make a release of the software with updated related documentation early next week, about one week ahead of the next Science Team meeting.

ATL02/Instrument Science:

Investigation of jumps in the TEP TOF has traced the origin of the jumps to measurement of the start pulse threshold-crossing times. Threshold-crossing times exhibit jumps equal and opposite to the jumps in the TEP TOF. (If the laser were actually firing earlier or later, the TEP photons would also arrive earlier or later, and the TOF would not change.) Further investigation may reveal the exact mechanism causing the jumps; in any case, this appears to be the kind of bias shift that the TEP was intended to detect. This finding will inform the strategy that the team will adopt for choosing when to update the value of TEP TOF used in range bias correction.

In addition, work continues on:

- Further characterization of “afterpulses” and their sources
- Refining the algorithm for pulse position from photon TOF data
- A new method for analyzing the results of on-orbit AMCS calibrations. The current method does not separate return from background, and is usable only for AMCS calibrations done over the night side of the earth. The new method will allow AMCS calibrations to be done usefully over the day side as well.
- Development of an algorithm for estimation of OFM transmittance peak shift from 2-step VBG sweep data.
- Correcting and optimizing ATL02 QA parameters.

ISF ACTIVITIES MISSION WEEK 058:

* Not in science mode
^ Could affect science data quality

2019/290:07:30:13.0000 OCEANscan Duration 22 minutes
* 2019/290:09:07:11.0000 AMCS Cal over open ocean Duration 2 minutes
* 2019/290:10:36:02.0000 TEP data collection Grid 36 Duration 3 minutes
* 2019/290:12:12:57.0000 TEP data collection Grid 69 Duration 3 minutes
* 2019/290:12:36:26.0000 TEP data collection Grid 392 Duration 3 minutes
^ 2019/290 13:30:26.0000 DMU29 for 60 minutes
* 2019/290:15:37:12.0000 TEP data collection Grid 280 Duration 3 minutes
* 2019/290:17:19:19.0000 TEP data collection Grid 385 Duration 3 minutes
* 2019/290:18:35:21.0000 TEP data collection Grid 132 Duration 3 minutes
* 2019/290:18:40:34.0000 TEP data collection Grid 203 Duration 3 minutes
* 2019/290:20:05:18.0000 TEP data collection Grid 57 Duration 3 minutes
2019/290:20:51:36.0000 OCEANscan Duration 22 minutes
* 2019/290:21:36:04.0000 TEP data collection Grid 19 Duration 3 minutes
* 2019/290:23:12:59.0000 TEP data collection Grid 53 Duration 3 minutes
* 2019/290:23:33:52.0000 TEP data collection Grid 340 Duration 3 minutes
* 2019/291:00:44:38.0000 TEP data collection Grid 15 Duration 3 minutes
* 2019/291:00:57:44.0000 TEP data collection Grid 194 Duration 3 minutes
* 2019/291:01:04:26.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
* 2019/291:01:13:23.0000 TEP data collection Grid 409 Duration 3 minutes
* 2019/291:04:00:10.0000 TEP data collection Grid 118 Duration 3 minutes
* 2019/291:04:16:44.0000 TEP data collection Grid 333 Duration 3 minutes
* 2019/291:05:48:25.0000 TEP data collection Grid 295 Duration 3 minutes
* 2019/291:05:51:41.0000 AMCS Cal over open ocean Duration 2 minutes
* 2019/291:07:07:15.0000 AMCS Cal over open ocean Duration 2 minutes
2019/291:08:38:52.0000 OCEANscan Duration 22 minutes
* 2019/291:10:09:09.0000 TEP data collection Grid 1 Duration 3 minutes
* 2019/291:10:30:51.0000 TEP data collection Grid 324 Duration 3 minutes
2019/291:11:00:00.0000 Laser window dump Duration 2 minutes
* 2019/291:11:49:55.0000 TEP data collection Grid 106 Duration 3 minutes
* 2019/291:12:13:25.0000 TEP data collection Grid 429 Duration 3 minutes
* 2019/291:13:22:41.0000 TEP data collection Grid 67 Duration 3 minutes
* 2019/291:13:47:43.0000 TEP data collection Grid 426 Duration 3 minutes
* 2019/291:16:30:11.0000 TEP data collection Grid 63 Duration 3 minutes
* 2019/291:16:51:03.0000 TEP data collection Grid 350 Duration 3 minutes
* 2019/291:18:20:08.0000 TEP data collection Grid 276 Duration 3 minutes
* 2019/291:20:04:53.0000 TEP data collection Grid 417 Duration 3 minutes
2019/291:20:25:58.0000 OCEANscan Duration 22 minutes
* 2019/291:21:10:25.0000 TEP data collection Grid 20 Duration 3 minutes
* 2019/291:21:31:19.0000 TEP data collection Grid 307 Duration 3 minutes
2019/291:21:52:29.0000 RTWscan Duration 90 minutes

* 2019/292:00:33:36.0000 TEP data collection Grid 231 Duration 3 minutes
* 2019/292:00:38:48.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
* 2019/292:05:07:07.0000 TEP data collection Grid 80 Duration 3 minutes
* 2019/292:05:12:21.0000 TEP data collection Grid 152 Duration 3 minutes
* 2019/292:06:41:37.0000 AMCS Cal over open ocean Duration 2 minutes
2019/292:08:13:13.0000 OCEANscan Duration 22 minutes
* 2019/292:09:50:11.0000 AMCS Cal over open ocean Duration 2 minutes
* 2019/292:10:13:29.0000 TEP data collection Grid 432 Duration 3 minutes
* 2019/292:11:20:47.0000 TEP data collection Grid 71 Duration 3 minutes
* 2019/292:13:22:04.0000 TEP data collection Grid 427 Duration 3 minutes
* 2019/292:14:27:37.0000 TEP data collection Grid 30 Duration 3 minutes
* 2019/292:17:41:27.0000 TEP data collection Grid 97 Duration 3 minutes
* 2019/292:17:49:17.0000 TEP data collection Grid 205 Duration 3 minutes
2019/292:20:00:19.0000 OCEANscan Duration 22 minutes
2019/292:21:26:50.0000 RTWscan Duration 90 minutes
* 2019/292:23:57:28.0000 TEP data collection Grid 88 Duration 3 minutes
* 2019/293:00:13:09.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
* 2019/293:01:40:44.0000 TEP data collection Grid 193 Duration 3 minutes
* 2019/293:01:46:58.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
* 2019/293:06:15:58.0000 AMCS Cal over open ocean Duration 2 minutes
2019/293:07:47:35.0000 OCEANscan Duration 22 minutes
* 2019/293:09:24:33.0000 AMCS Cal over open ocean Duration 2 minutes
* 2019/293:14:12:27.0000 TEP data collection Grid 174 Duration 3 minutes
* 2019/293:17:18:25.0000 TEP data collection Grid 133 Duration 3 minutes
2019/293:19:34:40.0000 OCEANscan Duration 22 minutes
2019/293:22:35:29.0000 RTWscan Duration 90 minutes
* 2019/294:01:21:48.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
* 2019/294:05:53:26.0000 AMCS Cal over open ocean Duration 2 minutes
2019/294:07:21:56.0000 OCEANscan Duration 22 minutes
* 2019/294:08:58:54.0000 AMCS Cal over open ocean Duration 2 minutes
2019/294:19:09:02.0000 OCEANscan Duration 22 minutes
* 2019/295:00:56:09.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
2019/295:01:02:00.0000 Stellar window dump Duration 90 minutes
* 2019/295:05:42:14.0000 AMCS Cal over open ocean Duration 2 minutes
* 2019/295:06:58:58.0000 AMCS Cal over open ocean Duration 2 minutes
2019/295:08:30:34.0000 OCEANscan Duration 22 minutes
* 2019/295:18:53:47.0000 Put laser in ARM mode for LCA19 43559 (LEMUR-2 Alexander) 22-Oct-2019 18:54:02 Duration 1 minute
2019/295:20:17:40.0000 OCEANscan Duration 22 minutes
* 2019/296:00:30:30.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
* 2019/296:06:33:19.0000 AMCS Cal over open ocean Duration 2 minutes
2019/296:08:04:55.0000 OCEANscan Duration 22 minutes
* 2019/296:09:41:53.0000 AMCS Cal over open ocean Duration 2 minutes
2019/296:19:52:01.0000 OCEANscan Duration 22 minutes