ICESat-2 PROJECT SCIENCE OFFICE REPORT
Monday, September 16, 2019 thru Sunday, September 22, 2019

RGTs spanned: 1221-1327
Cycle 4

Items of Note:
All ATLAS housekeeping data is nominal; laser 2 is firing at energy level 4 and in science mode. Evaluation of release 002 data products continues, with a planned release of data to the public via NSIDC planned for early-mid October.

NSIDC ICESat-2 Metrics through September 22: 1,534 total users of 10 available data products; 877,925 sciences files downloaded. ATL08 is in the lead with 549 users and 342,892 files downloaded! ATL03 is 2nd with 527 users and 109,555 files downloaded, followed by ATL06 with 437 users and 342,892 files downloaded.

Photon Phriday featured data collected over a glacier in northwest Greenland that had recently been overflown by the Operation IceBridge mission.

ELEMENT DETAILS BELOW

CAMS/POD:
CAMS: Regular CAMS operations: constraint and conjunction monitoring for mission weeks 53 and 54, and mission planning for mission week 55

- MW054: Recommended laser to ARM for LC with 43894 (3K FLOCK 1), Pl 0.332%, miss distance 0.69km, TCA 2019/264 00:49:02

POD: Regular POD operations continue. Intermediate POD was completed for GPS week 2070. Final POD was completed for GPS week 2068. All results appear nominal.

POD is currently working on pointing bias calibration solutions for DoY 206-250 (spacecraft TAI-GPS offset fix through yaw-flip).

ISF:
All ATLAS housekeeping data is nominal
Laser 2 is firing at energy level 4 and in science mode
WTEM Peak to Edge Ratio: 1.224
Laser 2 Temperature Error: -0.26C
SADA in Airplane Mode
Spacecraft orientation: + X

Mission Planning:
MW54 ATS is loaded to the spacecraft and currently operating
MW55 is being planned, nominal calibration activities.

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Activities during the past week:

Real-time activities:
Executed sCAR166 to adjust the VBG setpoint temperature: 2019/256/18:09
Executed sCAR249 to adjust the BSM offset to 15.0, 11.0
Executed standing CAR427 to clear file load error flags (note this only cleared one flag; the CAR will be updated and re-run to clear the other flag.)
Executed sCAR91 and sCAR102 to clear routine SBS and SXP errors
Continued training new ISF operator - Daniel.

ATS activities:
Routine calibration activities, 2 orbits of TEP and extended VBG sweep in TEP mode.

Other Activities:
Split-ATS created for HIE14 with 43894 that was waived off due to object self-mitigating
Powered up the FLATLAS lab hardware after the planned power outage in Bld 1. One rack did not power due to bad UPS; facility engineers provided temporary power while UPS is being replaced.

Near-term activities:
Continuing to work with ASET and PSO regarding the frequency and location of nominal instrument calibrations
Continuing to work on the ISF tech refresh

Notes/Issues:

LTO Schedule:
All items remain on schedule

<u>SIPS</u>:

- 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 production of Release 002 ATL01, ATL02, ATL03, ATL04, ATL06, ATL07, ATL08, ATL09, ATL10, ATL12, and ATL13 for DOY 124-177, 2019.
  - ATL03 and higher level products have been distributed to the SCF for review
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- ATL01s and ATL02s have been distributed to NSIDC

· Completed production of Release 002 ATL01, ATL02, ATL03, ATL04, ATL06, ATL07, ATL08, ATL09, ATL10, ATL12, and ATL13 for DOY 287-335, 2018.
  - ATL03 and higher level products have been distributed to the SCF for review
  - ATL01s and ATL02s have been distributed to NSIDC

ASAS:
ASAS developers are working on the top priority issues as identified by their respective ATBD lead.

The L1B developer is working on verification of the useflag.

The L2A/L3A atmosphere developer is working on calibration method 3 and verification of the density dimension algorithm.

The L3B atmosphere developer is working on image smoothing.

The L3A/L3B sea ice developer is working on investigating specular returns and beginning work on the L3B PGE.

The L3A inland water developer is working on geolocation segment buffering.

The L3A ocean developer is investigating an infinite loop discovered in Ops processing.

SCF:
The SCF is operating nominally. Data for releases 002 and R002 are being ingested and distributed. Cooler is now receiving data products directly from SIPS, so its subscriptions at the SCF have been disabled. Older releases and data on the SCF and cooler are being deleted as needed. Two updates have been made to the operational code to improve performance, and formal testing of the next Visualizer release is set to begin next week. A file listing the current SCF data holdings is attached.

* Data Management -- A change to a verbose mode flag was made in the code to process browse images to stop certain cases from casing SDMS jobs to fail; a better method of handling those cases has undergone preliminary testing and may be put into operations in the future. A modification to the transaction trending calculation code has been made and is expected to significantly decrease the runtime of this job going forward. The cause of some empty plots when trending ATL08 is currently under investigation; it is not clear yet whether this is a problem or the proper results for the given data.

* Subsetter -- Currently running as expected. Some increase in speed is expected given recent improvements to surface type handling, already in operations.

* Visualizer -- Development of the Visualizer for its next release is expected to finish by Monday, at which point formal testing will begin. The release is planned for about one week before the next Science Team meeting, and it is currently on track.

ATL02/Instrument Science:
Christopher Field compared jumps in TEP TOF with steps in the calibration files used; there were some coincidences, but not complete correlation. The investigation continues. In doing this, he made the first extensive use of the parameter database that Katie Gosmeyer has constructed from ATL02 QA files.

Speaking of the ATL02 QA database, here's a short synopsis:
We created a PostgresSQL database and a supporting Python software architecture to store and daily ingest the contents of the ICESat-2 "QA" files produced alongside each product's H5 file. These QA files contain, as appropriate, either summary statistics or string values of the H5 file's parameters. Example parameters include sensor temperatures, photon times of flight, and names of calibration products. The database allows querying for product files based on parameter values, such as a temperature range or a flag setting, enables long-term trending of any parameter, and is more efficient than opening and retrieving information from the QA or H5 files themselves. In addition, this database has advantage over science-targeted databases such as the National Snow and Ice Data Center because it stores the full set of parameters, regardless of applicability to engineering or science. For our studies the database has so far proven to be a valuable tool in retrieving lists of product files containing seldom-downlinked data groups, finding product files with certain "useflag" ranges, and trending mean temperatures of certain sensors across time.

Experiments with automatic screening of ATL02 QA parameters have begun. This is expected to result in refinement of the screening parameters.

In addition, work continues on:

- Re-analysis of TEP and MA/AT return times of flight during instrument thermal/vacuum testing, using the latest TOF computation methods. This includes inquiry into the stability of the exponentially-modified Gaussian fits.

- 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.

- Investigation of apparent change in Spot 3 TEP strength after the late June/early July safehold

- Estimation of OFM transmittance peak shift from 2-step VBG sweep data

ISF ACTIVITIES MISSION WEEK 054:

* Not in science mode
^ Could affect science data quality

* 2019/262:00:36:54.0000 Grid 53 TEP data collection Duration 3 minutes
* 2019/262:01:34:26.0000 Grid 249 TEP data collection Duration 3 minutes
* 2019/262:01:47:29.0000 Grid 69 TEP data collection Duration 3 minutes
* 2019/262:02:58:17.0000 Grid 391 TEP data collection Duration 3 minutes
* 2019/262:03:13:56.0000 Grid 175 TEP data collection Duration 3 minutes
* 2019/262:03:21:47.0000 Grid 66 TEP data collection Duration 3 minutes
* 2019/262:03:59:18.0000 Grid 227 TEP data collection Duration 3 minutes
* 2019/262:04:37:48.0000 Grid 317 TEP data collection Duration 3 minutes
* 2019/262:05:17:09.0000 Grid 10 TEP data collection Duration 3 minutes
* 2019/262:05:38:03.0000 Grid 297 TEP data collection Duration 3 minutes
* 2019/262:05:45:37.0000 Grid 405 TEP data collection Duration 3 minutes
* 2019/262:06:04:14.0000 Grid 423 TEP data collection Duration 3 minutes
* 2019/262:06:19:54.0000 Grid 206 TEP data collection Duration 3 minutes
* 2019/262:06:31:14.0000 Grid 61 TEP data collection Duration 3 minutes
* 2019/262:06:51:56.0000 Grid 7 TEP data collection Duration 3 minutes
* 2019/262:07:07:08.0000 Grid 223 TEP data collection Duration 3 minutes
* 2019/262:07:15:18.0000 AMCS Cal over open ocean Duration 2 minutes
* 2019/262:07:48:59.0000 Grid 276 TEP data collection Duration 3 minutes
* 2019/262:07:54:12.0000 Grid 204 TEP data collection Duration 3 minutes
* 2019/262:08:04:39.0000 Grid 59 TEP data collection Duration 3 minutes
* 2019/262:08:31:10.0000 AMCS Cal over open ocean Duration 2 minutes
* 2019/262:09:31:05.0000 Grid 165 TEP data collection Duration 3 minutes
  2019/262:10:02:47.0000 OCEANscan Duration 22 minutes
* 2019/262:10:27:50.0000 Grid 398 TEP data collection Duration 3 minutes
* 2019/262:10:47:04.0000 Grid 416 TEP data collection Duration 3 minutes
* 2019/262:10:54:57.0000 Grid 307 TEP data collection Duration 3 minutes
* 2019/262:11:39:33.0000 Grid 108 TEP data collection Duration 3 minutes
^ 2019/262:12:07:12.0000 DMU026 Duration 55 minutes
* 2019/262:14:02:26.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
* 2019/262:14:25:32.0000 Grid 13 TEP data collection Duration 3 minutes
* 2019/262:14:55:58.0000 Grid 211 TEP data collection Duration 3 minutes
* 2019/262:15:32:36.0000 Grid 372 TEP data collection Duration 3 minutes
* 2019/262:17:09:30.0000 Grid 334 TEP data collection Duration 3 minutes
* 2019/262:18:46:24.0000 Grid 295 TEP data collection Duration 3 minutes
* 2019/262:19:28:25.0000 Grid 60 TEP data collection Duration 3 minutes
* 2019/262:20:18:17.0000 AMCS Cal over open ocean Duration 2 minutes
* 2019/262:21:10:32.0000 Grid 166 TEP data collection Duration 3 minutes

2019/262:21:49:53.0000 OCEANscan Duration 22 minutes
* 2019/262:22:41:12.0000 Grid 128 TEP data collection Duration 3 minutes
* 2019/263:01:45:33.0000 Grid 51 TEP data collection Duration 3 minutes
* 2019/263:01:53:24.0000 Grid 159 TEP data collection Duration 3 minutes
* 2019/263:02:02:43.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
* 2019/263:02:32:38.0000 Grid 392 TEP data collection Duration 3 minutes
* 2019/263:02:58:46.0000 Grid 31 TEP data collection Duration 3 minutes
* 2019/263:03:45:10.0000 Grid 408 TEP data collection Duration 3 minutes
* 2019/263:05:49:03.0000 Grid 279 TEP data collection Duration 3 minutes
* 2019/263:06:25:47.0000 Grid 8 TEP data collection Duration 3 minutes
* 2019/263:07:15:30.0000 Grid 385 TEP data collection Duration 3 minutes
* 2019/263:07:19:52.0000 Grid 313 TEP data collection Duration 3 minutes
* 2019/263:08:05:32.0000 AMCS Cal over open ocean Duration 2 minutes
2019/263:09:37:08.0000 OCEANscan Duration 22 minutes
* 2019/263:11:14:06.0000 AMCS Cal over open ocean Duration 2 minutes
* 2019/263:13:36:47.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
* 2019/263:14:25:06.0000 Grid 140 TEP data collection Duration 3 minutes
* 2019/263:15:14:47.0000 Grid 265 TEP data collection Duration 3 minutes
* 2019/263:18:23:22.0000 Grid 260 TEP data collection Duration 3 minutes
* 2019/263:19:14:37.0000 Grid 241 TEP data collection Duration 3 minutes
* 2019/263:19:52:39.0000 AMCS Cal over open ocean Duration 2 minutes
* 2019/263:20:39:10.0000 Grid 95 TEP data collection Duration 3 minutes
2019/263:21:24:14.0000 OCEANscan Duration 22 minutes
* 2019/263:23:01:13.0000 AMCS Cal over open ocean Duration 2 minutes
* 2019/264:01:19:48.0000 Grid 52T EP data collection Duration 3 minutes
* 2019/264:01:37:04.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
* 2019/264:03:04:00.0000 2 orbits of TEP calibration with BSM in manual mode Duration 192 minutes
* 2019/264:07:39:53.0000 AMCS Cal over open ocean Duration 2 minutes
* 2019/264:08:29:23.0000 Grid 311 TEP data collection Duration 3 minutes
2019/264:09:11:30.0000 OCEANscan Duration 22 minutes
* 2019/264:10:48:28.0000 AMCS Cal over open ocean Duration 2 minutes
* 2019/264:14:45:26.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
* 2019/264:15:36:22.0000 Grid 174 TEP data collection Duration 3 minutes
* 2019/264:16:23:26.0000 Grid 266 TEP data collection Duration 3 minutes
* 2019/264:16:30:16.0000 Grid 155 TEP data collection Duration 3 minutes
* 2019/264:19:27:00.0000 AMCS Cal over open ocean Duration 2 minutes
2019/264:21:00:00.0000 Laser window dump Duration 2 minutes
* 2019/264:21:10:01.0000 AMCS Cal over open ocean Duration 2 minutes
2019/264:22:32:53.0000 OCEANscan Duration 22 minutes
2019/264:23:59:24.0000 RTWscan Duration 90 minutes
* 2019/265:02:45:43.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
* 2019/265:07:16:45.0000 AMCS Cal over open ocean Duration 2 minutes
2019/265:08:45:51.0000 OCEANscan Duration 22 minutes

* 2019/265:10:22:49.0000 AMCS Cal over open ocean Duration 2 minutes
* 2019/265:14:19:47.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
* 2019/265:19:11:02.0000 AMCS Cal over open ocean Duration 2 minutes
  2019/265:20:32:57.0000 OCEANscan Duration 22 minutes
* 2019/265:22:09:56.0000 AMCS Cal over open ocean Duration 2 minutes
* 2019/265:23:54:00.0000 VBG sweep in Manual TEP mode with AMCS in Manual mode Duration 172 minutes
* 2019/266:07:05:32.0000 AMCS Cal over open ocean Duration 2 minutes
* 2019/266:08:22:53.0000 AMCS Cal over open ocean Duration 2 minutes
  2019/266:09:54:29.0000 OCEANscan Duration 22 minutes
* 2019/266:13:54:08.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
* 2019/266:20:09:59.0000 AMCS Cal over open ocean Duration 2 minutes
  2019/266:21:41:35.0000 OCEANscan Duration 22 minutes
  2019/266:23:08:06.0000 RTWscan Duration 90 minutes
* 2019/267:01:54:25.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
  2019/267:02:02:00.0000 Stellar window dump Duration 90 minutes
* 2019/267:07:57:14.0000 AMCS Cal over open ocean Duration 2 minutes
  2019/267:09:28:50.0000 OCEANscan Duration 22 minutes
* 2019/267:11:05:48.0000 AMCS Cal over open ocean Duration 2 minutes
* 2019/267:13:28:29.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
* 2019/267:15:02:46.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
* 2019/267:19:44:20.0000 AMCS Cal over open ocean Duration 2 minutes
  2019/267:21:15:56.0000 OCEANscan Duration 22 minutes
* 2019/267:22:52:55.0000 AMCS Cal over open ocean Duration 2 minutes
* 2019/268:01:28:46.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
* 2019/268:07:31:35.0000 AMCS Cal over open ocean Duration 2 minutes
  2019/268:09:03:11.0000 OCEANscan Duration 22 minutes
* 2019/268:10:40:09.0000 AMCS Cal over open ocean Duration 2 minutes
* 2019/268:13:05:40.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
* 2019/268:14:37:07.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
* 2019/268:19:18:41.0000 AMCS Cal over open ocean Duration 2 minutes
  2019/268:20:50:17.0000 OCEANscan Duration 22 minutes
* 2019/268:22:27:16.0000 AMCS Cal over open ocean Duration 2 minutes