ICESat-2 PROJECT SCIENCE OFFICE REPORT
Monday, September 9, 2019 thru Sunday, September 15, 2019

RGTs spanned: 1114-1220
Cycle 4

Items of Note:
All ATLAS housekeeping data is nominal; laser 2 is firing at energy level 4 and in science mode. SIPS build 4.2 is now operational, with release R002 (rapid) and 002 (final) data products being delivered to the SCF for review or to NSIDC for immediate public distribution (based on the data review and delivery scheme developed by the PSO and the science team; details below in the SIPS report).

NSIDC ICESat-2 Metrics through September 16: 1,481 total users of 10 available data products; 835,256 sciences files downloaded. ATL08 is in the lead with 532 users and 332,809 files downloaded! ATL03 is 2nd with 497 users and 105,562 files downloaded, followed by ATL06 with 424 users and 313,530 files downloaded.

Happy 1st Birthday ICESat-2! Thanks to everyone who came and celebrated with us last Thursday! There was a very special Photon Phriday featuring project scientist Tom Neumann . . . check it out!

ELEMENT DETAILS BELOW

CAMS/POD/PPD:
CAMS: Regular CAMS operations continue with constraint and conjunction monitoring for Mission Weeks 52 and 53, and mission planning for Mission Week 54.

CAMS supported mini-ATS for MW053

- Mitigated an LEMUR2 WINGO (41874) HIE (2.091 Pl, laser miss < 0.21 km) with laser to arm

CAMS is also preparing to see if any upcoming RGT tracks pass by 3 moorings off the West Coast. CAMS plotted up the RGTs tracks that come near the 3 moorings and calculated the closest distance from these moorings.

POD: Regular POD operations continue. Intermediate POD was completed for GPS week 2069. Final POD was completed for GPS week 2067. All results appear nominal.

POD also analyzed zero-range bias files provided by the ISF, the latest of which contained range bias estimates over the duration of the mission. POD looked to see if there was any correlation between range bias and orbit angle, beta prime angle, or ascending vs. descending passes.

ISF:

All ATLAS housekeeping data is nominal
Laser 2 is firing at energy level 4 and in science mode
WTEM Peak to Edge Ratio: 1.235
Laser 2 Temperature Error: -0.33C
SADA in Airplane Mode
Spacecraft orientation: + X

Mission Planning:
MW53 ATS is loaded to the spacecraft and currently operating
MW54 is being planned, nominal calibration activities, 164 mTEP mode VBG sweep, and a two orbit TEP stare.
~~~~~~

Activities during the past week:

Real-time activities:
Executed standing CAR166 to adjust the VBG setpoint temperature (note 1):
2019/252/19:33, 2019/253/19:08, 2019/255/16:58, 2019/256/16:32
Executed standing CAR91 and CAR102 to clear routine SBS and SXP errors

ATS activities:
Routine calibration activities, one TOO

Other Activities:
Mini-ATS created for LCA16 41874 (LEMUR 2 WINGO) with a laser to ARM sequence 2019/257/15:26:10
Set the NOGO/GO ILRS flags around DMU25 2019/255.
We discussed the results of the August science activities with the PSO and ASET 2019/255, including the shift in the observed AMCS bias following the yaw flip, we'd seen a similar shift flip001, as well as the current status of the LRS, USO, and VBG monitoring and trending.
The ISF and FSSE successfully powered the entire FLATLAS labs hardware in preparation of a planned power outage in Bld 1 this weekend.

Near-term activities:
ISF and FSSE will bring the FLATLAS lab back to powered status mid-next week.
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:
1: The WTEM peak to edge ratio settled back to a higher value following the initial 164 min VBG sweep 2019/251/00:00, increasing to 1.3. The team has been lowering the VBG setpoint temperature gradually to bring the peak to edge ratio back to the desired 1.2 value.
~~~~~~

LTO Schedule:
All items remain on schedule
RSA maintenance agreements are being renewed

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.

· SIPS Build 4.2 is now operational.
· Rapid Release R002 products (ATL03, ATL04, ATL09) are being generated and distributed to the SCF
· Release 002 ATL01 and ATL02 products are being distributed to NSIDC, ISF, POD, and the SCF
· Started production of Release 002 ATL01, ATL02, ATL03, ATL04, ATL06, ATL07, ATL08, ATL09, ATL10, ATL12, and ATL13 for DOY 124-177.
  - ATL03 and higher level products are being distributed to the SCF for review
· Opened up a connection to "Cooler" from the SIPS I/O node and set up subscriptions to distribute selected data.

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

ASAS has been re-developing the HDF product designer. This is the tool used to create/modify the product templates. The old Web/PHP-based version no longer meets NASA security standards. The new code is being rewritten as a stand-alone Python app.

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

Improvements have been made in the SIPS product status report. This report will be made available to the SDT once new hardware is installed at SCF.

L2/L3 atmosphere work continues with the comparison of DDA results with science team code.

The atmosphere L3B developer is reviewing the updated L3B atmosphere ATBD and is providing feedback to the ATBD lead.

The Sea Ice/Freeboard L3B products are in development.

The Land Ice ATL11 L3B code is being modified to work in a production environment.

Several improvements have been made to the ocean code. Developer is now working on photon rate. An issue was discovered within SIPS Release 002 processing where a small percentage of ocean PGE runs enter an infinite loop, running for days. ASAS is investigating.

Inland water work is focused on buffering data when approaching and leaving water bodies.

SCF:
The SCF is operating nominally. Data for releases 002 and R002 are being ingested and distributed; ATL16 and ATL17 release 001 will be ingested and distributed once they are produced. Old data are being deleted as needed to make room for the new data. The data management scripts and Subsetter code have both been updated to Python 3 in operations. A few minor issues have arisen, but they are not specific to the Python 3 conversion; causes are known, and fixes are in progress if not already implemented. A file listing the current SCF data holdings is attached.

* Data Management -- The Python 3 release is operating well, but a few patches are needed.
- ATL08 trending update for product changes (fixed in ops). The code change needed for this was made and tested before but accidentally left out of the release.
- ATL10 trending plots not produced in certain cases (fixed in ops). This was due to a typo in the code.
- Extracting browse images: all available images are extracted, but if any of the expected images are missing, what should be warnings cause SDMS jobs to fail. The cause is known, and fixes are being tested.

* Subsetter -- A previously discovered bug related to no data surviving subsetting reappeared. The cause was identified, and a fix was developed, tested, and promptly put into operations.

* Visualizer -- Updating the code to Python 3 continues. A new plot type has been added to handle the RGB images available in ATL16 and ATL17. A plan is in place for finishing development, testing the code, making the apps, and producing a release in Python 3 in advance of the next Science Team meeting at the end of October.

ATL02/Instrument Science:
Tony Martino presented in invited paper, “ICESat-2 Mission Overview and Early Performance”, at the SPIE Remote Sensing conference in Strasbourg, France.

Versions of the ATL02 ATBD and “Known Issues” document to accompany Release 002 were circulated for review. Some minor changes will be made before release.

Christopher Field’s spectral analysis of TEP time of flight during 2-orbit TEP stares reveals a peak-to-peak variation of 10 to 20 ps in the TEP position at the orbital frequency. Jumps of about 40 ps remain unexplained; we plan to look for coincidences with steps in the calibration data.

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

- 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 053:

* Not in science mode
^ Could affect science data quality

* 2019/255:00:48:47.0000 TEP data collection Duration 3 minutes every orbit grid 341
* 2019/255:03:33:51.0000 TEP data collection Duration 3 minutes every orbit grid 13
* 2019/255:03:57:21.0000 TEP data collection Duration 3 minutes every orbit grid 336
* 2019/255:04:02:35.0000 TEP data collection Duration 3 minutes every orbit grid 408
* 2019/255:05:10:46.0000 TEP data collection Duration 3 minutes every orbit grid 46
* 2019/255:05:23:50.0000 TEP data collection Duration 3 minutes every orbit grid 226
* 2019/255:06:45:03.0000 TEP data collection Duration 3 minutes every orbit grid 44
* 2019/255:08:16:43.0000 TEP data collection Duration 3 minutes every orbit grid 6
* 2019/255:08:22:10.0000 AMCS Cal over open ocean Duration 2 minutes
* 2019/255:08:46:31.0000 TEP data collection Duration 3 minutes every orbit grid 400
  2019/255:09:53:46.0000 OCEANscan Duration 22 minutes
* 2019/255:10:19:45.0000 TEP data collection Duration 3 minutes every orbit grid 398
* 2019/255:11:30:45.0000 AMCS Cal over open ocean Duration 2 minutes
* 2019/255:14:57:23.0000 TEP data collection Duration 3 minutes every orbit grid 355
* 2019/255:16:08:10.0000 TEP data collection Duration 3 minutes every orbit grid 30
* 2019/255:19:24:37.0000 TEP data collection Duration 3 minutes every orbit grid 133
* 2019/255:19:29:50.0000 TEP data collection Duration 3 minutes every orbit grid 205
* 2019/255:21:09:20.0000 TEP data collection Duration 3 minutes every orbit grid 274
* 2019/255:21:17:09.0000 TEP data collection Duration 3 minutes every orbit grid 382
  2019/255:21:40:52.0000 OCEANscan Duration 22 minutes
* 2019/255:22:41:01.0000 TEP data collection Duration 3 minutes every orbit grid 236
* 2019/255:22:46:13.0000 TEP data collection Duration 3 minutes every orbit grid 308

^ 2019/255:23:45:27.0000 DMU025 Duration 60 minutes
* 2019/256:03:21:17.0000 TEP data collection Duration 3 minutes every orbit grid 193
* 2019/256:03:27:59.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
* 2019/256:07:56:31.0000 AMCS Cal over open ocean Duration 2 minutes
2019/256:09:28:07.0000 OCEANscan Duration 22 minutes
* 2019/256:11:05:06.0000 AMCS Cal over open ocean Duration 2 minutes
* 2019/256:14:10:51.0000 TEP data collection Duration 3 minutes every orbit grid 69
* 2019/256:17:32:28.0000 TEP data collection Duration 3 minutes every orbit grid 244
* 2019/256:19:01:35.0000 TEP data collection Duration 3 minutes every orbit grid 169
2019/256:21:15:13.0000 OCEANscan Duration 22 minutes
* 2019/256:22:14:13.0000 TEP data collection Duration 3 minutes every orbit grid 237
* 2019/256:22:17:58.0000 TEP data collection Duration 3 minutes every orbit grid 272
* 2019/256:22:23:11.0000 TEP data collection Duration 3 minutes every orbit grid 344
* 2019/256:23:33:58.0000 TEP data collection Duration 3 minutes every orbit grid 19
* 2019/257:00:00:05.0000 TEP data collection Duration 3 minutes every orbit grid 378
* 2019/257:02:50:25.0000 TEP data collection Duration 3 minutes every orbit grid 122
* 2019/257:03:02:21.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
* 2019/257:03:08:40.0000 TEP data collection Duration 3 minutes every orbit grid 373
* 2019/257:04:32:32.0000 TEP data collection Duration 3 minutes every orbit grid 227
* 2019/257:04:42:57.0000 TEP data collection Duration 3 minutes every orbit grid 371
* 2019/257:07:37:12.0000 AMCS Cal over open ocean Duration 2 minutes
2019/257:09:02:29.0000 OCEANscan Duration 22 minutes
* 2019/257:10:39:27.0000 AMCS Cal over open ocean Duration 2 minutes
* 2019/257:13:47:50.0000 TEP data collection Duration 3 minutes every orbit grid 105
* 2019/257:14:05:42.0000 TEP data collection Duration 3 minutes every orbit grid 357
* 2019/257:15:45:37.0000 TEP data collection Duration 3 minutes every orbit grid 426
* 2019/257:16:51:10.0000 TEP data collection Duration 3 minutes every orbit grid 29
* 2019/257:15:25:55.0000 Put laser in ARM mode for LCA16 41874 (LEMUR 2 WINGO) 14-Sep-2019 15:26:10 Duration 1 minute
* 2019/257:17:14:40.0000 TEP data collection Duration 3 minutes every orbit grid 352
* 2019/257:20:05:00.0000 TEP data collection Duration 3 minutes every orbit grid 96
2019/257:22:23:52.0000 OCEANscan Duration 22 minutes
* 2019/257:23:10:57.0000 TEP data collection Duration 3 minutes every orbit grid 55
2019/258:01:00:00.0000 Laser window dump Duration 2 minutes
* 2019/258:07:24:30.0000 AMCS Cal over open ocean Duration 2 minutes
* 2019/258:08:39:31.0000 AMCS Cal over open ocean Duration 2 minutes
2019/258:10:11:07.0000 OCEANscan Duration 22 minutes
* 2019/258:13:43:03.0000 TEP data collection Duration 3 minutes every orbit grid 393
2019/258:21:58:13.0000 OCEANscan Duration 22 minutes
* 2019/258:23:06:11.0000 TEP data collection Duration 3 minutes every orbit grid 343
* 2019/259:02:06:32.0000 TEP data collection Duration 3 minutes every orbit grid 231
* 2019/259:02:11:03.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
* 2019/259:02:20:00.0000 TEP data collection Duration 3 minutes every orbit grid 410
* 2019/259:08:13:52.0000 AMCS Cal over open ocean Duration 2 minutes

2019/259:09:45:28.0000 OCEANscan Duration 22 minutes
* 2019/259:11:22:27.0000 AMCS Cal over open ocean Duration 2 minutes
2019/259:21:02:00.0000 Stellar window dump Duration 90 minutes
2019/259:23:06:52.0000 OCEANscan Duration 22 minutes
2019/260:00:33:22.0000 RTWscan Duration 90 minutes
* 2019/260:03:19:42.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
* 2019/260:07:48:13.0000 AMCS Cal over open ocean Duration 2 minutes
2019/260:09:19:50.0000 OCEANscan Duration 22 minutes
* 2019/260:10:56:48.0000 AMCS Cal over open ocean Duration 2 minutes
* 2019/260:20:39:07.0000 TEP data collection Duration 3 minutes every orbit grid 310
2019/260:21:06:55.0000 OCEANscan Duration 22 minutes
2019/261:00:07:44.0000 RTWscan Duration 90 minutes
* 2019/261:02:54:03.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
* 2019/261:03:02:59.0000 TEP data collection Duration 3 minutes every orbit grid 409
* 2019/261:07:26:57.0000 AMCS Cal over open ocean Duration 2 minutes
2019/261:08:54:11.0000 OCEANscan Duration 22 minutes
* 2019/261:10:31:09.0000 AMCS Cal over open ocean Duration 2 minutes
2019/261:22:15:34.0000 OCEANscan Duration 22 minutes