

**ICESat-2 PROJECT SCIENCE OFFICE REPORT**  
**Monday, December 10, 2018 thru Sunday, December 16, 2018**

RGTs spanned: 1120-1217  
Cycle 1

**Items of Note:**

All ATLAS housekeeping data is nominal; Laser 2 is firing at energy level 4 and in science mode. The PSO had a substantial presence at the Fall AGU meeting in Washington DC last week with posters on ATLAS pre-launch calibration efforts, preliminary on-orbit characterization and assessment of ATLAS, ATL03 photon classification, organization of the ATL03 data product, and evaluation using the 88S GPS and airborne data sets. In addition, plots of ATL03 data were the main attraction at the Town Hall, Press Briefing, and ICESat-2 overview oral presentations.

**\*\*ELEMENT DETAILS BELOW\*\***

**CAMS/POD/PPD:**

**CAMS:** CAMS continues to monitor and screen for mission week 014. No conjunction or constraints to report. Daily operations continue nominally. There are no constraint warning or detected laser conjunction events at this time.

**POD:** Final POD for GPS week 2028 has been completed and delivered to SIPS. Intermediate POD for GPS week 2030 has not yet been completed, due to multiple issues with ATL02 files from last week (multiple gaps in files, and many files missing datasets).

POD also performed calibration runs for days beyond the first calibration period where round-the-world scans were performed. From this we were able to observe the time-varying nature of the roll/pitch bias solutions, which are significant.

PPD: Still working on PAD with the LRS stellar side and we are also coordinating with POD to continue the investigation into the large biases on pointing.

**ISF:**

All ATLAS housekeeping data is nominal  
Laser 2 is firing at energy level 4 and in science mode  
Laser 2 Temp Err: -0.13  
WTEM Peak to Edge Ratio 1.121

**Mission Planning:**

MW14 ATS is loaded to the spacecraft and currently operating.

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Activities during the past week:

ATS activities:

All ATLAS and pointing activities were routine and completed as planned

DMU006 executed successfully on Thursday, 12/13 (2018/347 00:32:22.0000 to 2018/347 01:34:27.0000)

Real-time activities

Dec 11: 2018/345/14:50:45 Executed standing CAR91 to clear SBC errors

Dec 12: 2018/346/20:38:34 Executed standing CAR91 to clear SBC errors

Dec 13:

2018/347/13:58:44: CAR336 Updated the LRS Stellar Background Image to v4.2 to mitigate for warm pixels and start Stellar image window dumps. ^ no stellar centroids down-linked due to the window dumps

2018/347/16:56:25: CAR336 Stopped the stellar window image dumps.

2018/347/20:20:53: Executed CAR338 to clear the SBC route error

Dec 14: 2018/348/13:32:47 Executed standing CAR91 to clear SBC errors

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Upcoming activities:

MW14 scheduled activities in the ATS: MW14 Attached

MW15 planning

Other Near-term activities:

ISF server patching - trouble-shooting an issue for Redhat patching across RIONet.

ISF Quarterly Scan - Dec 17

Yaw flip to -X - December 28

Retrograde DMU Demo

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Notes/Issues:

1. It appears some re-dumps did not contain expected VC6 data - working with the MOC to resolve this.
2. PDB E.0.0 was received from the MOC; it will be installed on the dev server and tested. \* No rec files were found in the zip file - the MOC was notified

### **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 ATL01s via special request to the SCF.
- EDOS started delivery of the star tracker VC-05 PDSs to SIPS. SIPS is routinely ingesting and distributing three of the five VC-05 PDSs (APIDs 27, 133, 142, 144, and 153). APIDs 144 and 153 have not been turned on.
- Produced and distributed Rel 201 ATL03/04/09 files for DOY 329-335 to the PSO and NSIDC.
- Produced and distributed Rel 202 ATL03/04/09 files for DOY 322-328 to the PSO and NSIDC.

### **ASAS:**

Reprocessing five days of on-orbit data with the latest ASAS code: 10-14-2018 thru 10-17-2018 and 10-19-2018. The mixture of predict/intermediate/final geolocation products (and multiple versions of each) added a new twist that required changes to the ASAS test infrastructure. However, updated L1-L2 and ATL09 products should be going onto dev1 (and cooler) later today. The remaining L3A products will come later.

Developed an automated, web-based test report generator for ASAS test products. The test report provides a summary of the products created, including statistics on file sizes, processing time and QA/Error status. Detailed reports are also generated that include extracted browse images and detail-level error and QA information.

### **L1A –ATL01**

Continued verification and implementation of S/C star tracker VC5 packet additions. Achieved a full merge on the single test case for which the VC5 data are available. Remaining task is to determine if there is any way to verify that alignment is correct.

### **L1B- ATL02**

Continued working Calibration updates with engineering team

Implementing ATBD QA checks.

The ATBD lead has identified issues with both the calibration product and ATBD algorithms for receiver sensitivity. An ATBD update is forthcoming.

#### **L2A-ALT ATL03**

Implementing change to reduced background counts based on ATBD updates

#### **L2A – ATM ATL04**

Implementing replacement background method1 algorithm

#### **L3A-ATM ATL09**

ST is evaluating removal of the ground surface as the lowest cloud and ground surface from Density method

#### **L3B –ATM ATL16/17**

Continue developing unit test for L3B PGE.

#### **L3A- land ice ATL06**

New test file provide to ST lead for evaluation and latest code delivered for their use.

Preparing issues for CCB review

#### **L3A Sea Ice ATL07/10**

Investigating bugs that cause crash with in flight data.

Fixed implementation of first photon bias to use proper signal width.

Implementing product updates.

Implementing disable for multi-beam freeboard

#### **L3A- Land ATL08**

Continued evaluation of alternative DRAGANN to improve results.

#### **L3A Ocean ATL12**

No work. Developer working Land Ice

Issues with ASAS sea state bias computation are next implementations.

#### **L3A Inland Water ATL13**

Preparing issues for CCB review by working with ST lead provided data.

Providing test results on background removal from long segment histogram and background QA flag

### **SCF:**

The SCF has ingested and distributed data for releases 202 and 201 that it received from SDMS. All operations are nominal. We installed a new set of scripts that streamline some of the functions and add the capability to use multiple polynomial KML files when subsetting. We wrote a script to parse the instrument activity file and output a csv file listing the ATLO3 files affected for each activity. Both the original instrument activity files and the csv files are posted on the SCF website under Instrument/ATLAS ISF Activities. All reports, browse products and trending plots have been updated regularly.

### **ATLO2:**

Two posters were presented at the American Geophysical Union fall meeting:

“Pre-Launch Calibration Efforts for the ATLAS Instrument on ICESat-2” (C.M. Gosmeyer et al.)

“Preliminary On-Orbit Performance Characterization of the ATLAS Instrument on ICESat-2” (A.J. Martino et al.)

Investigation of a question from the atmospheric science group revealed an error in CAL 30 (nominal absolute receiver sensitivity). While the source of the error in analysis from raw data is being sought, interim CAL 30 data files were produced using an analysis of sequential print files that showed reliably consistent accuracy throughout I&T. The same investigation also revealed some corrections needed in the ATLO2 product.

Work continued on CAL 47, CAL 49, and CAL 52.

Investigation continues on:

- Possible afterpulsing evident under very strong return conditions
- Power drop in Flight 1 laser (in laboratory life test)

### **ATLO3:**

The ATLO3 data product had a substantial presence at the Fall AGU meeting in Washington DC last week with posters on the photon classification, organization of the ATLO3 data product, and evaluation using the 88S GPS and airborne data sets. In addition, plots of ATLO3 data were the main attraction at the Town Hall, Press Briefing, and ICESat-2 overview oral presentations.

In parallel, a new version of ATL03 was generated last week, and included all edits to date. This version closes 8 issues, and will be reviewed at the ATL03 tag up on Friday. Pending ASAS concurrence, this release will support our first post-launch ATL03 data release.

A thorough scrub of the geophysical corrections on ATL03 demonstrated that the corrections agree with external models to better than 0.1 mm in most cases. There appears to be some small systematic discrepancies that remain a focus of continued investigation. For example the difference in the Ocean Pole Tide (i.e. the Ocean Pole Tide error) ranges around the orbit from -50 microns to +50 microns, suggesting a time interpolation problem. The differences are small enough to not impact science results, but point to improvements that are possible in the ATL03 implementation of these models.

#### **ISF ACTIVITIES MISSION WEEK 014:**

\* Not in science mode

^ Could affect science data quality

\* 2018/347:00:30:38.0000 TEP data collection for 3 minutes

^ 2018/347 00:32:22.0000 DMU006 for 62 minutes

\* 2018/347:02:04:55.0000 TEP data collection for 3 minutes

^ 2018/347:02:15:00.0000 Stellar centroid image dump for 90 minutes (no stellar centroids)

\* 2018/347:03:39:13.0000 TEP data collection for 3 minutes

^ 2018/347:09:35:30.0000 AMCS Cal for 2 minutes

2018/347:11:07:06.0000 OCEANscan (22 minutes)

^ 2018/347:12:44:05.0000 AMCS Cal for 2 minutes

\* 2018/347:16:13:32.0000 TEP data collection for 3 minutes

\* 2018/347:17:47:50.0000 TEP data collection for 3 minutes

\* 2018/347:19:22:07.0000 TEP data collection for 3 minutes

\* 2018/347:20:56:25.0000 TEP data collection for 3 minutes

\* 2018/347:22:30:42.0000 TEP data collection for 3 minutes

2018/347:22:54:21.0000 OCEANscan (22 minutes)

\* 2018/348:00:04:59.0000 TEP data collection for 3 minutes

\* 2018/348:01:39:17.0000 TEP data collection for 3 minutes

\* 2018/348:03:13:34.0000 TEP data collection for 3 minutes

^ 2018/348:04:00:00.0000 Stellar centroid window dump for 90 minutes (no stellar centroids)

^ 2018/348:09:09:52.0000 AMCS Cal for 2 minutes

2018/348:10:41:27.0000 OCEANscan (22 minutes)

^ 2018/348:12:18:26.0000 AMCS Cal for 2 minutes

\* 2018/348:15:47:54.0000 TEP data collection for 3 minutes

\* 2018/348:17:22:11.0000 TEP data collection for 3 minutes

\* 2018/348:18:56:29.0000 TEP data collection for 3 minutes

\* 2018/348:20:30:46.0000 TEP data collection for 3 minutes

\* 2018/348:22:05:04.0000 TEP data collection for 3 minutes

2018/348:22:28:43.0000 OCEANscan (22 minutes)

\* 2018/348:23:39:21.0000 TEP data collection for 3 minutes

\* 2018/349:01:13:38.0000 TEP data collection for 3 minutes

\* 2018/349:02:47:56.0000 TEP data collection for 3 minutes

^ 2018/349:08:44:13.0000 AMCS Cal for 2 minutes

2018/349:10:15:49.0000 OCEANscan (22 minutes)  
^ 2018/349:11:52:48.0000 AMCS Cal for 2 minutes  
^ 2018/349:12:19:06.0000 Mini-VBG sweep (set temp = 61.83) for 3 minutes  
2018/349:13:16:37.0000 RTWscan (90 minutes)  
\* 2018/349:15:25:34.0000 TEP data collection for 3 minutes  
\* 2018/349:16:56:32.0000 TEP data collection for 3 minutes  
\* 2018/349:18:30:50.0000 TEP data collection for 3 minutes  
\* 2018/349:20:05:07.0000 TEP data collection for 3 minutes  
\* 2018/349:21:39:25.0000 TEP data collection for 3 minutes  
2018/349:22:03:04.0000 OCEANscan (22 minutes)  
\* 2018/349:23:13:42.0000 TEP data collection for 3 minutes  
\* 2018/350:00:48:00.0000 TEP data collection for 3 minutes  
\* 2018/350:02:22:17.0000 TEP data collection for 3 minutes  
^ 2018/350:08:32:19.0000 AMCS Cal for 2 minutes  
^ 2018/350:09:52:52.0000 AMCS Cal for 2 minutes  
2018/350:11:24:27.0000 OCEANscan (22 minutes)  
^ 2018/350:13:27:45.0000 Mini-VBG sweep (set temp = 63.83) for 3 minutes  
\* 2018/350:16:30:54.0000 TEP data collection for 3 minutes  
\* 2018/350:18:05:11.0000 TEP data collection for 3 minutes  
\* 2018/350:19:39:29.0000 TEP data collection for 3 minutes  
\* 2018/350:21:13:46.0000 TEP data collection for 3 minutes  
\* 2018/350:22:48:03.0000 TEP data collection for 3 minutes  
2018/350:23:11:43.0000 OCEANscan (22 minutes)  
\* 2018/351:00:22:21.0000 TEP data collection for 3 minutes  
\* 2018/351:01:56:38.0000 TEP data collection for 3 minutes  
\* 2018/351:03:30:55.0000 TEP data collection for 3 minutes  
^ 2018/351:09:27:13.0000 AMCS Cal for 2 minutes  
2018/351:10:58:48.0000 OCEANscan (22 minutes)  
^ 2018/351:12:35:06.0000 AMCS Cal for 2 minutes  
\* 2018/351:16:05:15.0000 TEP data collection for 3 minutes  
\* 2018/351:17:39:32.0000 TEP data collection for 3 minutes  
\* 2018/351:19:13:50.0000 TEP data collection for 3 minutes  
\* 2018/351:20:48:07.0000 TEP data collection for 3 minutes  
\* 2018/351:22:22:25.0000 TEP data collection for 3 minutes  
2018/351:22:46:04.0000 OCEANscan (22 minutes)  
\* 2018/351:23:56:42.0000 TEP data collection for 3 minutes  
\* 2018/352:01:30:59.0000 TEP data collection for 3 minutes  
\* 2018/352:03:05:17.0000 TEP data collection for 3 minutes  
^ 2018/352:09:01:34.0000 AMCS Cal for 2 minutes  
2018/352:10:33:10.0000 OCEANscan (22 minutes)  
^ 2018/352:12:10:09.0000 AMCS Cal for 2 minutes  
\* 2018/352:15:39:36.0000 TEP data collection for 3 minutes  
\* 2018/352:17:13:53.0000 TEP data collection for 3 minutes  
\* 2018/352:18:48:11.0000 TEP data collection for 3 minutes  
\* 2018/352:20:22:28.0000 TEP data collection for 3 minutes  
\* 2018/352:21:56:46.0000 TEP data collection for 3 minutes  
2018/352:22:20:25.0000 OCEANscan (22 minutes)  
\* 2018/352:23:31:03.0000 TEP data collection for 3 minutes

- \* 2018/353:01:05:20.0000 TEP data collection for 3 minutes
- \* 2018/353:02:39:38.0000 TEP data collection for 3 minutes
- ^ 2018/353:08:35:55.0000 AMCS Cal for 2 minutes
- 2018/353:10:07:31.0000 OCEANscan (22 minutes)
- ^ 2018/353:11:44:30.0000 AMCS Cal for 2 minutes
- ^ 2018/353:12:14:36.0000 Laser image dump over Antarctica for 6 minutes (no laser centroids)
- 2018/353:13:08:19.0000 RTWscan (90 minutes)
- \* 2018/353:15:15:57.0000 TEP data collection for 3 minutes
- \* 2018/353:16:48:14.0000 TEP data collection for 3 minutes
- \* 2018/353:18:22:32.0000 TEP data collection for 3 minutes
- \* 2018/353:19:56:49.0000 TEP data collection for 3 minutes
- \* 2018/353:21:31:07.0000 TEP data collection for 3 minutes
- 2018/353:21:54:46.0000 OCEANscan (22 minutes)
- \* 2018/353:23:05:24.0000 TEP data collection for 3 minutes