**ICESat-2 PROJECT SCIENCE OFFICE REPORT**
**Monday, June 24, 2019 thru Sunday, June 30, 2019**

RGTs spanned: ---
Cycle 3

**Items of Note**:
ICESat-2 entered Safe mode on 2019/177 ~18:12. ATLAS is OFF. Spacecraft recovery has started. All Spacecraft related ATLAS housekeeping data is nominal for safe mode.

On June 26 at approximately 18:35 GMT ICESat-2 experienced a Solar Array Drive Assembly (SADA) potentiometer fault which transitioned the spacecraft to Safe Hold Mode. Members of the ICESat-2 Flight Operation Team, Spacecraft Sustaining Engineering, ATLAS Sustaining Engineering, Mission Director, ESMO, and Project Science Office quickly pulled together to verify the safety of ATLAS and the spacecraft, undergo solar array slew tests, begin powering on spacecraft systems, and plan instrument turn on procedures to safely transition back to normal operations.

New data products covering the period 2/24-5/2 began to be produced by SIPS and were distributed to the PSO and ICESat-2 science team for evaluation prior to public distribution. Shortly after the evaluation period began an anomaly was discovered and through quick communication between the PSO, POD/PPD, SIPS, and ASAS teams the root cause of the anomaly was determined to be due to the incorrect application of range biases. A new version of the data products is now being produced with initial evaluation showing a level quality more in line with data from the period prior to 2/24 which is currently publicly available.

Your weekly Photon Phriday update!

Have a great 4th of July!

**ELEMENT DETAILS BELOW**

**CAMS/POD/PPD**:
**CAMS:** Regular CAMS operations continued with constraint and conjunction monitoring for mission weeks 41 and 42. Monitoring stopped on June 27, 2019 due to the spacecraft being in safehold. Mission planning for mission week 43 was performed today. Further mission planning will continue when ATLAS is powered back on.

CAMS generated ~~a~~ corrected SAT to be used after the SADA transition to AIRPLANE mode to correct the pitch and roll values of the 1st two Ocean Scans after the transition. These 2 Ocean Scans had roll and pitch values that were used in SAILBOAT mode. In addition, CAMS generated an MCR to re-plan the maneuver for June 29, 2019 that satisfied all constraint restrictions. Neither of these files were used due to the satellite being in safehold.

**POD:** Regular POD operations continue. Final POD was completed for GPS week 2056.

POD re-delivered to SIPS corrected ANC04 files for DoY 2019055 – 2019122. The Science team discovered the original ANC04 files had an issue. The POD team investigated and discovered the files contained the wrong range bias values. The ANC04 files were then generated with the correct range bias values.

PPD: Nominal operations continue. Final ANC05 PPD products have been delivered through DOY 161(June 10).

**ISF**:
ICESat-2 entered Safe mode on 2019/177 ~18:12. ATLAS is OFF. Spacecraft recovery has started.

All Spacecraft related ATLAS housekeeping data is nominal for safe mode.

SADA in Airplane Mode
Spacecraft orientation: - Z, Sun pointing

Mission Planning:
MW41 ATS was stopped during safemode entry (updated MW_41 PSO list attached)
MW42 planning was completed and loaded but was not activated due to safemode entry.
No further planning until return to normal operations
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Activities during the past week:
ATS activities:
All ATLAS and pointing activities were routine and completed as planned until safemode entry.

Real-time activities:
Daily/as-need: Executed standing CAR 91 and 102 (routine error cleanup)
Executed CAR 396 to dump additional diagnostic packets. 2019/176 (6/25/19) (note 1)

Other Activities:
Team continues to plan and schedule the upcoming tech refresh
Team continues to review the MCR and Laser Conjunction processes.
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Next week's ATLAS activities:
Perform activation to power on and return to science mode

Other Near-term activities:
Load V8 Receiver Algorithm Parameters

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Notes/Issues:

1. FSSE requested diagnostic data to investigate 'HS logger dropped messages' event on PCE1 and to clear the resultant error counts.

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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.
- Spacecraft went into safe hold on June 27 and no Level 0 data has been delivered to the SIPS since that time.
- Received final ANC03/04/05 files from the POD for DOY 055-122 on June 24.
  - Generated and distributed the L2A and L3A products to the SCF from DOY 55-89. Stopped producing additional days as there was a problem with the POD files.
- Received an updated set of final ANC03/04/05 files from the POD (version 002) for DOY 055-122 on June 27.
  - Started production of Release 001 ATL03, ATL04, ATL06, ATL07, ATL08, ATL09, ATL10, ATL12, and ATL13 products for DOY 055-122.
  - Started distribution of these products to the SCF.

**ASAS**:

A resolution was found to the issue of easily sharing ASAS test data with science team members. Unfortunately, it involves a hardware purchase. We will attempt to distribute the 952 pre-release data in the same manner as 951. Once hardware is in place, we can deliver intermediate results much easier.

Most of the QA checks for ATL02 are code-complete. Next step is to add all those QA flags to ATL02.

No work on ATL03.

The vertical alignment correction and bin height calculations are being corrected for ATL04/ATL09.

Testing is underway for using an updated Antarctic DEM using ATL06 data to fill gaps.

Work is underway on all impacted PGE regarding the addition of equilibrium tide.

The Land/Veg developer is continuing to work on additional quality checks for DRAGGAN-detected signal.

The Sea Ice developer is beginning to look at the L3B Sea Ice product and working an issue regarding the correct beam assignment for ASR.

The inland water developer continues to work on sub-surface detection.

The ocean developer fixed the infinite loop at equator crossings and is now working on thresholds.

ASAS assisted in the verification of updated range bias parameters and helped resolve an issue in production processing caused by updated range biases.

**SCF**:
The SCF is operating nominally. Data for releases 001 and R001 are being ingested and distributed. When notified that some of the newest 001 data had a problem, the affected data present at the SCF were deleted. These are now being replaced by a new version of the data that resolves the issue. A bug in trending ATL06 has been identified, and options for fixing it are being evaluated. Work continues on developing and testing a Python 3 environment suitable for our code base. A file listing the current SCF data holdings is attached.

* Data Management -- Monitored ingest of data and resolved failed jobs, most of which were due to deleting data before jobs had finished running. Set up another staff member with the SDMS Desktop, which required restarting SDMS; manual adjustments were made in the database to handle jobs affected by the restart. Found and examined an issue with ATL06 trending where missing ground tracks are not always handled correctly. How to fix this without negatively impacting the creation of trending plots is under discussion.

* Subsetter -- Continued working on and testing a Python 3 environment that will also work with the data management scripts. Decided this is probably sufficiently stable to install system-wide and use in further testing.

* Visualizer -- Updated repository with latest version of the code. Continued working on converting the code from Python 2 to Python 3. Decided that the Visualizer will use its own Python 3 environment, separate from the data management scripts and Subsetter.

**ATL02/Instrument Science**:
Testing of the revised CAL 08 revealed difficulties with the differences between spots. The work continues.

A software tool for quickly finding ATL02 granules that meet user-specified criteria has been demonstrated in prototype form. Work continues to make it easily usable, and to populate its database.

A preliminary analysis of 1-D ATLAS beam profiles derived from retroreflector returns in Antarctica showed size and shape consistent with pre-launch calibration measurements at the appropriate temperature. These returns contained more photon-detection events than the retroreflector returns analyzed previously, allowing a better view of the shape.

**ATL03**:
A quick analysis of "new" ATL03 and ATL06 data from the latest batch of data produced and delivered by SIPS revealed a significant height bias as compared to GPS data collected at the 88S calibration site. New ancillary products were created and delivered to allow for a quick turn-around in data reprocessing, and the issue was corrected.

Work continues on ATBD and product updates leading up to the 15 July code freeze (equilibrium tide addition to ATL03 and upper-level data products, new TEP QA guidelines for ANC41, adding POD/PPD "degrade" flags onto the product as an initial quality assessment of the data in a particular granule).