ICESat-2 PROJECT SCIENCE OFFICE REPORT
Monday, July 6, 2020 thru Sunday, July 12, 2020

RGTs spanned: 161 - 268
Cycle 8

SUMMARY:
All ATLAS housekeeping data is nominal; laser 2 is firing at energy level 4 and in science mode. Another PCE2 delay-line data swap event occurred on July 9 (UTC) which will necessitate a reset of PCE2. The data swap is being corrected automatically in ATL02 by the new algorithms introduced after the last such event. The Instrument Science team is examining the ATL01 data to compare this event with previous ones.

ELEMENT DETAILS BELOW

CAMS/POD:
CAMS: Regular CAMS operations: constraint and conjunction monitoring for MW095 and MW096 and mission planning for MW097.
CAMS recommends laser arm for 43419 (XJS B) 193/02:22:52 - 193/02:23:02(MW096)
CAMS is working with the project on ARB09 and has delivered supporting documents.

POD: Regular POD operations continue. Intermediate POD was completed for GPS week 2112. Final POD was completed for GPS week 2110.

ISF:
All ATLAS housekeeping data is nominal
Laser 2 is firing at energy level 4 and in science mode
WTEM Peak to Edge Ratio: 1.191
Laser 2 Temperature Error: -0.29C
SADA in AIRPLANE Mode
Spacecraft orientation: - X

Mission Planning:
MW96 ATS is loaded to the spacecraft and currently operating (PSO Activity List is attached)

MW97 AIP has been delivered, nominal calibrations

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Activities during the past week:

Real-time activities:
   monitoring via telework; detected PCE2 is in the stuck bit condition (see Note 2)
ATS activities:
   MW_96 (currently loaded and executing):
     Routine Instrument calibrations, Ocean scans and Vegetation Data collection, modified RTW
       mini ATS: LCA52 to mitigate HIE with 43519 (Laser to ARM 2020/193 02:22:57)
       mini ATS: LCA53 to mitigate HIE with 42051 (Laser to ARM 2020/197 21:35:12)

DMU055a on 2020/191 (July 09, 2020)

Other Past Activities:

Near-term upcoming activities:
    SAM to SAILBOAT on 2020/199 (July 17, 2020)
    PCE2 reboot and re-initialization during MW097.
    DMU056a on 2020/205 (July 23, 2020)
    Tech HW refresh:
        Starting procurement for ISF Tech Refresh Phase 2 to complete during FY20

Facility:
RSA Token re-order - notified tokens delivered to GSFC
RSA licenses renewed

Notes/Issues:
1. ARB09: RMM02 Anomaly - the team continues to analyze events and determine process (automated and manual) updates to mitigate the chance of a recurrence. The team is providing inputs for root cause analysis and corrective action.
2. PCE2 is in the stuck bit condition. PCE2 will be rebooted and re-initialized out of the ATS for MW097. This will greatly minimize the time out of science mode.

LTO Schedule:
All items remain on schedule. Draft dates for Tech Refresh provided to ESMO scheduler.

SIPS:
· The SIPS is operating nominally:
    o Ingested and distributed Level 0 data to the ISF.
    o Generated L1A and L1B products and distributed ATL02s to the ISF, POD, and SCF.
    o Distributed selected ATL01s to the ISF and SCF by special request.
    o Generated rapids ATL03, ATL04, ATL06, ATL07, ATL08, ATL09, and ATL10 using ANC03/04/05 files from the CAMS.
    o Distributed the ATL01 and ATL02 Data products to NSIDC.
    o Distributed the rapid Science Data products to the SCF.
· Distributed Release 003 ATL12s for April 5 - May 13, 2020 to NSIDC.
· Distributed Rel. 003 ATL10s for Nov 16, 2019- April 4, 2020. ST requested holds were implemented.
· SIPS is currently exploring options to replace GridFTP, which is the file transfer protocol between SIPS and NSIDC. NASA security has mandated a switch to the HTTPS protocol. We have a waiver until February 2021. We are in discussions with NSIDC, ESDIS, and the SED to have something in place before that.

ASAS:
Additional data (July 26 2019 and August 8 2019) were added to the 954a2 Functional Test set, were processed and have been transferred to SCF. These data were specifically requested by the Sea Ice team for evaluation of saturation within melt ponds.

ATL02s for 11/11/2018 05:00-09:00:00 were created with the 954a2 software and transferred to POD. These are intended to test the ATL02 GPSR IMT accuracy fix.

3 months of ATL10s have been transferred to ASAS-PG. As soon as code changes are finalized, ASAS will create the corresponding ATL20s and provide them to the Sea Ice team and NSIDC for evaluation.

Data conversion, software development and initial testing for the MERIT DEM have been completed. The next ASAS Functional Test will generate products using MERIT as a replacement for GMTED. Please report any findings regarding the accuracy/completeness of MERIT vs GMTED.

Within L3A atmosphere, the software for cloud/aerosol discrimination is in work.

The L3B atmosphere work continues on template and grid size changes. A sample template was delivered to the ATBD lead for evaluation.

The ATL11 team is working improvements to the QA utility and exception handling. Issues reported by NSIDC have been addressed. PSO is working with ASAS and the ATL11 team to define the roles, responsibilities and processes required for formal ATL11 production and delivery.

The software for interpolating roll/pitch/yaw for ATL03 is in testing.

Land/Veg work includes KDTREE radius expansion and adding photon rate statistics for canopy and terrain.

With PSO/ATBD Lead approval, the next ASAS Functional Test will include ATL06s produced by the refactored PGE.

ATL20 development is wrapping up with additional testing for the Southern hemisphere. ASAS is preparing to deliver example data to the Sea Ice team and NSIDC. Development on ATL21 should begin shortly.

For inland water, testing continues on spectral analysis. The developer has completed work on the tide-free/mean-tide changes and is working on surface slope. A product template for the ATL22 L3B inland water product has been delivered to the ATBD lead for review.

Ocean development is focused on testing the effectiveness of podppd_flag, testing layer flag changes and implementation of the tide-free/mean-tide changes.

SCF:
The SCF is operating nominally. Data for releases 003 and R003 are being ingested and distributed, and processing for all subscriptions has caught up and is current. Two code updates were made in operations (see below). A file listing the current SCF data holdings is attached.

* Data Management -- Testing of an option to allow skipping ANC products when extracting browse images was completed and the code has been updated in operations; it is working as expected. Testing of revised ATL10 trending code was completed and an update made in operations. Trending ran successfully, but one day of plots showed unexpected results. It appears that a possible logic error in the code may be the cause. This is being investigated, but since it does not appear to be triggered most cases, ATL10 trending will continue to be run in operations; this will provide more data for debugging the code.

* Subsetter -- All operations proceeded as expected.

ATL02/Instrument Science:
Initial analysis of possible ATLAS returns from Starlink spacecraft indicates a potential cumulative effect risk, but not a risk of a sudden catastrophic effect. Analysis continues with goals of predicting the frequency with which conjunctions are likely to occur, and the likelihood of actually getting a return at a concerning level in the event of a conjunction. A similar risk appears to exist with respect to reflections of the sun.

Another PCE2 delay-line data swap event occurred on July 9 (UTC) which will necessitate a reset of PCE2. The data swap is being corrected automatically in ATL02 by the new algorithms introduced after the last such event. The Instrument Science team is examining the ATL01 data to compare this event with previous ones.

In addition, work continues on:

- Investigating and modeling the properties of saturated returns.

- Evaluating the latest analysis of ATLAS range bias.

- Writing up the results of the study of variation of range bias on orbital and seasonal time scales.

- Re-examining the temperature dependence of the ATLAS transmitted beam divergence.

- Investigating and explaining "interesting" behavior revealed by the expanded ATLAS QA screening process.

- Improving the process for calibrating transmitter-receiver alignment.

ATL03:
Identifying high-priority items in the works for release 004 continues, including a new DEM for land surface type (MERIT), signal confidence modification for saturated conditions, implementation of the free-to-mean tide conversion equations for EGM2008 and solid earth (crustal) tides, roll/pitch/yaw being provided at the geolocation segment rate, and modifications for geophysical corrections to be tide-free. Continuing to explore long-term data including radiometry performance over ice sheets, beam incidence angles, and saturation fractions.

ISF ACTIVITIES MISSION WEEK 096

^ 2020/191:02:40:41.0000 DMM055b Duration 61 minutes
  2020/191:04:34:31.0000 TOO TOOid=1571, RGT=211, offpoint=1.38deg Duration 2 minutes
* 2020/191:04:56:42.0000 TEP data collection Grid 43 Duration 3 minutes
* 2020/191:06:10:18.0000 AMCS Cal over open ocean Duration 2 minutes
  2020/191:07:41:54.0000 OCEANscan Duration 22 minutes

2020/191:08:16:53.0000 TOO TOOid=1564, RGT=213, offpoint=4.60deg Duration 2 minutes
* 2020/191:09:18:53.0000 AMCS Cal over open ocean Duration 2 minutes
* 2020/191:12:29:52.0000 TEP data collection Grid 320 Duration 3 minutes
* 2020/191:12:48:08.0000 TEP data collection Grid 67 Duration 3 minutes
* 2020/191:14:04:10.0000 TEP data collection Grid 317 Duration 3 minutes
* 2020/191:14:09:22.0000 TEP data collection Grid 245 Duration 3 minutes
* 2020/191:14:19:48.0000 TEP data collection Grid 101 Duration 3 minutes
* 2020/191:15:59:21.0000 TEP data collection Grid 26 Duration 3 minutes
* 2020/191:17:04:54.0000 TEP data collection Grid 421 Duration 3 minutes
* 2020/191:18:54:51.0000 TEP data collection Grid 202 Duration 3 minutes
  2020/191:19:29:09.0000 OCEANscan Duration 22 minutes
  2020/191:20:04:03.0000 TOO TOOid=1557, RGT=221, offpoint=4.74deg Duration 2 minutes
* 2020/191:20:16:06.0000 TEP data collection Grid 380 Duration 3 minutes
* 2020/191:21:47:46.0000 TEP data collection Grid 414 Duration 3 minutes
* 2020/191:23:28:48.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
* 2020/191:23:45:33.0000 TEP data collection Grid 87 Duration 3 minutes
* 2020/192:01:03:05.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
* 2020/192:02:43:42.0000 TEP data collection Grid 226 Duration 3 minutes
* 2020/192:02:59:22.0000 TEP data collection Grid 10 Duration 3 minutes
  2020/192:04:01:00.0000 Stellar window dump Duration 90 minutes
* 2020/192:05:44:39.0000 AMCS Cal over open ocean Duration 2 minutes
  2020/192:07:16:15.0000 OCEANscan Duration 22 minutes
* 2020/192:08:53:14.0000 AMCS Cal over open ocean Duration 2 minutes
  2020/192:10:17:03.0000 Segmented RTWscan Part 1 Duration 37 minutes
  2020/192:11:05:51.0000 Segmented RTWscan Part 2 Duration 34 minutes
  2020/192:11:46:39.0000 Segmented RTWscan Part 3 Duration 14 minutes
  2020/192:12:34:06.0000 TOO TOOid=1565, RGT=231, offpoint=4.59deg Duration 2 minutes
  2020/192:14:55:33.0000 TOO TOOid=1558, RGT=233, offpoint=4.69deg Duration 2 minutes
  2020/192:16:14:53.0000 TOO TOOid=1555, RGT=234, offpoint=5.00deg Duration 2 minutes
* 2020/192:18:26:36.0000 TEP data collection Grid 239 Duration 3 minutes
  2020/192:19:03:30.0000 OCEANscan Duration 22 minutes
* 2020/193:00:37:27.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
* 2020/193:02:22:42.0000 Laser in ARM mode for LCA52 43519 (XJS B) 11-Jul-2020 02:22:57 Duration 1 minute
* 2020/193:05:19:14.0000 AMCS Cal over open ocean Duration 2 minutes
  2020/193:06:38:26.0000 TOO TOOid=1559, RGT=243, offpoint=4.73deg Duration 2 minutes
  2020/193:06:50:36.0000 OCEANscan Duration 22 minutes
* 2020/193:08:27:35.0000 AMCS Cal over open ocean Duration 2 minutes
* 2020/193:10:23:14.0000 TEP data collection Grid 70 Duration 3 minutes
  2020/193:11:15:00.0000 Laser window dump Duration 2 minutes

* 2020/193:11:33:21.0000 TEP data collection Grid 393 Duration 3 minutes
* 2020/193:11:43:47.0000 TEP data collection Grid 249 Duration 3 minutes
* 2020/193:15:00:11.0000 TEP data collection Grid 136 Duration 3 minutes
  2020/193:18:25:40.0000 TOO TOOid=1566, RGT=250, offpoint=4.69deg Duration 2 minutes
  2020/193:18:37:51.0000 OCEANscan Duration 22 minutes
* 2020/194:00:11:48.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
* 2020/194:02:02:50.0000 TEP data collection Grid 83 Duration 3 minutes
* 2020/194:03:37:07.0000 TEP data collection Grid 81 Duration 3 minutes
  2020/194:03:51:22.0000 TOO TOOid=1567, RGT=256, offpoint=4.56deg Duration 2 minutes
* 2020/194:05:07:45.0000 AMCS Cal over open ocean Duration 2 minutes
* 2020/194:06:27:39.0000 AMCS Cal over open ocean Duration 2 minutes
  2020/194:07:59:15.0000 OCEANscan Duration 22 minutes
  2020/194:10:55:39.0000 TOO TOOid=1560, RGT=261, offpoint=4.76deg Duration 2 minutes
* 2020/194:12:55:02.0000 TEP data collection Grid 211 Duration 3 minutes
* 2020/194:13:08:07.0000 TEP data collection Grid 30 Duration 3 minutes
* 2020/194:14:16:17.0000 TEP data collection Grid 389 Duration 3 minutes
* 2020/194:16:03:37.0000 TEP data collection Grid 206 Duration 3 minutes
* 2020/194:18:59:09.0000 TEP data collection Grid 382 Duration 3 minutes
* 2020/194:19:04:23.0000 TEP data collection Grid 310 Duration 3 minutes
* 2020/194:19:20:02.0000 TEP data collection Grid 93 Duration 3 minutes
* 2020/194:19:25:17.0000 TEP data collection Grid 21 Duration 3 minutes
  2020/194:19:46:30.0000 OCEANscan Duration 22 minutes
* 2020/194:22:18:10.0000 TEP data collection Grid 233 Duration 3 minutes
* 2020/194:23:46:09.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
* 2020/195:00:08:09.0000 TEP data collection Grid 14 Duration 3 minutes
* 2020/195:02:47:59.0000 TEP data collection Grid 406 Duration 3 minutes
* 2020/195:02:58:26.0000 TEP data collection Grid 262 Duration 3 minutes
  2020/195:04:26:13.0000 TOO TOOid=1572, RGT=272, offpoint=3.86deg Duration 2 minutes
* 2020/195:04:35:20.0000 TEP data collection Grid 223 Duration 3 minutes
* 2020/195:06:02:00.0000 AMCS Cal over open ocean Duration 2 minutes
  2020/195:07:33:36.0000 OCEANscan Duration 22 minutes
* 2020/195:09:09:54.0000 AMCS Cal over open ocean Duration 2 minutes
  2020/195:09:42:53.0000 TOO TOOid=1568, RGT=275, offpoint=4.61deg Duration 2 minutes
* 2020/195:11:02:55.0000 TEP data collection Grid 105 Duration 3 minutes
  2020/195:12:04:19.0000 TOO TOOid=1561, RGT=277, offpoint=4.73deg Duration 2 minutes
* 2020/195:17:20:05.0000 TEP data collection Grid 96 Duration 3 minutes
  2020/195:19:20:51.0000 OCEANscan Duration 22 minutes
* 2020/195:22:05:35.0000 TEP data collection Grid 53 Duration 3 minutes
* 2020/195:23:20:30.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
* 2020/196:00:54:47.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes

* 2020/196:03:55:32.0000 TEP data collection Grid 405 Duration 3 minutes
* 2020/196:03:59:15.0000 TEP data collection Grid 368 Duration 3 minutes
* 2020/196:05:36:21.0000 AMCS Cal over open ocean Duration 2 minutes
  2020/196:07:07:57.0000 OCEANscan Duration 22 minutes
* 2020/196:07:32:42.0000 TEP data collection Grid 3 Duration 3 minutes
* 2020/196:08:44:56.0000 AMCS Cal over open ocean Duration 2 minutes
* 2020/196:13:32:49.0000 TEP data collection Grid 282 Duration 3 minutes
* 2020/196:15:01:53.0000 TEP data collection Grid 352 Duration 3 minutes
  2020/196:16:08:10.0000 TOO TOOid=1573, RGT=295, offpoint=1.65deg Duration 2 minutes
* 2020/196:16:44:00.0000 TEP data collection Grid 241 Duration 3 minutes
* 2020/196:16:51:49.0000 TEP data collection Grid 133 Duration 3 minutes
  2020/196:18:55:12.0000 OCEANscan Duration 22 minutes
  2020/196:21:04:24.0000 TOO TOOid=1562, RGT=298, offpoint=4.75deg Duration 2 minutes
  2020/196:23:25:52.0000 TOO TOOid=1569, RGT=299, offpoint=4.65deg Duration 2 minutes
* 2020/197:00:29:08.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
* 2020/197:00:48:31.0000 TEP data collection Grid 49 Duration 3 minutes
* 2020/197:03:41:00.0000 TEP data collection Grid 261 Duration 3 minutes
  2020/197:04:55:52.0000 TOO TOOid=1563, RGT=303, offpoint=4.72deg Duration 2 minutes
* 2020/197:05:10:42.0000 AMCS Cal over open ocean Duration 2 minutes
  2020/197:06:42:18.0000 OCEANscan Duration 22 minutes
* 2020/197:08:19:17.0000 AMCS Cal over open ocean Duration 2 minutes
  2020/197:09:43:06.0000 Segmented RTWscan Part 1 Duration 37 minutes
  2020/197:10:32:12.0000 Segmented RTWscan Part 2 Duration 34 minutes
  2020/197:11:12:45.0000 Segmented RTWscan Part 3 Duration 14 minutes
* 2020/197:13:09:46.0000 TEP data collection Grid 246 Duration 3 minutes
  2020/197:16:43:01.0000 TOO TOOid=1570, RGT=310, offpoint=4.58deg Duration 2 minutes
  2020/197:18:29:33.0000 OCEANscan Duration 22 minutes
* 2020/197:19:21:43.0000 TEP data collection Grid 309 Duration 3 minutes
* 2020/197:21:34:57.0000 Laser in ARM mode after LCA53 42051 (FLOCK 3P 72) 15-Jul-2020 21:35:12 Duration 1 minute