ICESat-2 PROJECT SCIENCE OFFICE REPORT
Monday, July 20, 2020 thru Sunday, July 26, 2020

RGTs spanned: 377 - 483
Cycle 8

SUMMARY:
All ATLAS housekeeping data is nominal; laser 2 is firing at energy level 4 and in science mode. ASAS is currently executing the next functional test (954a3). This functional test will feature ATL03s with the MERIT DEM, (unfilled) Roll, Pitch, Yaw, the refactored ATL06 code as well as other changes. ATBD leads, please work with your developers to determine what changes for your product were included in this test.

ELEMENT DETAILS BELOW

CAMS/POD:
CAMS: Regular CAMS operations: constraint and conjunction monitoring for MW097 and MW098 and mission planning for MW099.
CAMS recommended laser arm for 43521 (CZ-2C) on 205/23:17:20 - 205/23:27:30 (MW098). Event self-mitigated.
CAMS performed additional planning for MW098 SAT which contained RMM002 for CARA event with 43521 on DOY205.
CAMS continued working with the project on ARB09 and has delivered supporting documents.

POD: Regular POD operations continue. Intermediate POD was completed for GPS week 2114. Final POD was completed for GPS week 2112.

ISF:
All ATLAS housekeeping data is nominal
Laser 2 is firing at energy level 4 and in science mode
WTEM Peak to Edge Ratio: 1.177
Laser 2 Temperature Error: -0.32C
SADA in SAILBOAT Mode
Spacecraft orientation: - X

Mission Planning:
MW98 ATS is loaded to the spacecraft and currently operating (PSO Activity List is attached)

MW99 AIP has been delivered, nominal calibrations

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Activities during the past week:
Real-time activities: monitoring via telework
ATS activities:
MW_98 (currently loaded and executing):
Routine Instrument calibrations, Ocean scans and Vegetation Data collection, modified RTW
Restored BSM XY Offsets X 19.6 Y 10.0 2020/205:03:20:10 (see note 2)
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RMM002c Object 43521 23-Jul-2020 23:17:25 Burn Waived off
LCA56 to mitigate HIE with 43521 23-Jul-2020 23:17:25 (self-mitigated)

Other Activities:
no DMUs since spacecraft was predicted to drift back into the 800 meter box
Team was on-site to receive Phase 1a hardware and completed tasks as expected.
Updated ANC27 files with BSM XY Offsets resets was sent to SIPS.

Near-term upcoming activities:
Tech HW refresh:
Procurement in progress for ISF Tech Refresh Phase 2 to complete during FY20

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

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 has implemented changes to the manual processes for verification of planning products. The team is providing inputs for root cause analysis and corrective action.
2. Telemetry data showed two LCAs were executed on Saturday instead of the desired single LCA at 22:49:09. Originally two LCAs were planned (both with the old BSM XY Offset) but the one at 19:40:40 self-mitigated so an updated mini-ATS was created with only one LCA and the new BSM XY Offsets. However, the original mini-ATS was loaded inadvertently so two LCAs were executed and the offsets were set to the old values during the return to science after the LCAs.

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, ATL04, ATL06, ATL07, ATL08, ATL09, and ATL10 using ANC03/04/05 files from the CAMS.
  - Distributed the ATL01 and ATL02 Data products to NSIDC.
  - Distributed the rapid Science Data products to the SCF.
- Started preparations for testing of SDMS V7.0 on our Integration Test System. It consists of an updated Messaging System.
- Distributed via special request ATL01 data that overlaps the APID 1057s to the ISF for selected time periods.

ASAS:

ASAS is currently executing the next functional test (954a3). This functional test will feature ATL03s with the MERIT DEM, (unfilled) Roll, Pitch, Yaw, the refactored ATL06 code as well as other changes. Please work with your developers to determine what changes for your product were included in this test.

For the ATL02 GPSR IMT fix, POD evaluated the updated ATL02s for 11/11/2018 05:00-09:00:00 and found storing the GPSR IMT as a 64-bit signed integer on ATL02 provided the precision they required.

L1B: The ATL02 GPSR IMT fix has been approved by POD and will be included in the next release. The ANC41 code was updated to correctly identify an unlinked dimension scale.

L2A_ALT: Code to interpolate roll/pitch/yaw from ANC04 and populate ATL03 is included in the 954a3 PGE.

L2/L3 Atmosphere: Improved blowing snow code and several updated constants (via overrides) are included in the 954a3 PGE.

L3A Ice Sheet: The refactored code has been entered into the ASAS change control system and is creating the 954a3 ATL06s.

L3A Sea Ice/Freeboard: Default constants have been updated to the Release 3.0 override values. ASAS is participating in the discussion regarding mean/free tide systems. Work is underway on ATL07 podppd_flag saturation exclusion and freeboard along-track slope.

L3A Land/Veg: Updated the code for TEP removal. Work progresses on terrain and canopy photon rate.

L3A Inland Water: Work is focused on spectral width analysis. TEP and saturation flag filtering is in work.

L3A Ocean: Testing revealed that use of the layer flag removed too much signal. Work is underway on percent cloud cover, free2mean usage and lat/lon for the 10m bins.

L3B Land Ice: ASAS participated in a telecon with ADAPT to discuss setting up a production environment for ATL11 that is isolated from development. Some restructuring of ATL11 was performed, based on NSIDC feedback. The team is awaiting additional feedback from NSIDC.

L3B Atmosphere: Testing of grid size and product template changes is underway.

L3B Freeboard: Example products were generated and delivered to the Sea Ice team and NSIDC.

SCF:

The SCF is operating nominally. Data for releases 003 and R003 are being ingested and distributed. Old data are being deleted to free up space for ~2 months of new release 003 data expected next week. ASAS-dedicated storage has been installed, relevant material relocated there, and SCF users notified of the change; this material will be deleted from its original location next week. A file listing the current SCF data holdings is attached.

* Data Management -- Stand-alone executables of the rSCF data pull scripts have been created for macOS and Linux (further edits are required for Windows) and are currently being tested. Initial results are positive, so we may be able to offer this as an alternative to the Python code in the future.

* Subsetter -- Operations continue as expected. As planned last week, a configuration change was made on the SCF servers that may resolve our occasional subset failures due to multiple jobs simultaneously accessing the same file. It also improves the settings for use of SDMS in general.

* Visualizer -- Two bugs, related to pop-up tables and the "Show tab contents" tool, were fixed. These will be included in the next version of the software, which is expected when support for ASAS v5.4 products is added.

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. A similar risk appears to exist with respect to reflections of the sun. Both the rate at which conjunctions occur, and the probability of getting a high return in the event of a conjunction appear to be low; work is ongoing to quantify this.

Examination of ATL01 data from the 8 July PCE2 data swap event reveals some different features from the two earlier events of this kind. Investigation continues on the significance of these features.

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:
The team is awaiting feedback from the ATBD leads regarding inclusion of two new signal classification flags for nearly-saturated and fully-saturated photon returns in the *signal_conf_ph* parameter. Final text updates and tweaks of changes for release 004 are ongoing.

ISF ACTIVITIES MISSION WEEK 098

* 2020/205:03:16:58.0000 TEP data collection Grid 369 Duration 3 minutes
* 2020/205:03:20:10.0000 Update BSM XY Offsets X 19.6 Y 10.5 Duration 1 minute
* 2020/205:04:47:56.0000 TEP data collection Grid 403 Duration 3 minutes
* 2020/205:04:54:05.0000 AMCS Cal over open ocean Duration 2 minutes
2020/205:06:25:40.0000 OCEANscan Duration 22 minutes
* 2020/205:08:02:39.0000 AMCS Cal over open ocean Duration 2 minutes
^ 2020/205:09:23:55.0000 RMM002c Object 43521 23-Jul-2020 23:17:25 Waived off Duration 54 minutes
* 2020/205:11:17:33.0000 TEP data collection Grid 249 Duration 3 minutes
* 2020/205:11:34:33.0000 TEP data collection Grid 32 Duration 3 minutes

* 2020/205:12:43:40.0000 TEP data collection Grid 390 Duration 3 minutes
* 2020/205:12:53:08.0000 TEP data collection Grid 246 Duration 3 minutes
* 2020/205:13:05:58.0000 TEP data collection Grid 66 Duration 3 minutes
* 2020/205:14:27:26.0000 TEP data collection Grid 244 Duration 3 minutes
* 2020/205:14:33:37.0000 TEP data collection Grid 171 Duration 3 minutes
  2020/205:15:39:15.0000 TOO TOOid 1590 RGT 432 offpoint 4.68deg Duration 2 minutes
* 2020/205:17:38:37.0000 TEP data collection Grid 203 Duration 3 minutes
* 2020/205:17:48:00.0000 TEP data collection Grid 59 Duration 3 minutes
  2020/205:18:00:40.0000 TOO TOOid 1597 RGT 433 offpoint 4.57deg Duration 2 minutes
  2020/205:18:12:55.0000 OCEANscan Duration 22 minutes
* 2020/205:19:20:44.0000 TEP data collection Grid 92 Duration 3 minutes
* 2020/205:22:05:15.0000 TEP data collection Grid 413 Duration 3 minutes
* 2020/205:22:28:38.0000 TEP data collection Grid 88 Duration 3 minutes
* 2020/205:23:17:10.0000 Laser in ARM mode for LCA56 43521 23-Jul-2020 23:17:25
Duration 1 minute
* 2020/205:23:42:43.0000 TEP data collection Grid 374 Duration 3 minutes
* 2020/205:23:46:51.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
* 2020/205:23:55:50.0000 TEP data collection Grid 193 Duration 3 minutes
* 2020/206:00:00:59.0000 TEP data collection Grid 121 Duration 3 minutes
* 2020/206:01:14:24.0000 TEP data collection Grid 408 Duration 3 minutes
* 2020/206:01:40:30.0000 TEP data collection Grid 47 Duration 3 minutes
* 2020/206:02:59:08.0000 TEP data collection Grid 261 Duration 3 minutes
* 2020/206:04:25:35.0000 TEP data collection Grid 367 Duration 3 minutes
* 2020/206:04:36:44.0000 AMCS Cal over open ocean Duration 2 minutes
  2020/206:06:00:00.0000 OCEANscan Duration 22 minutes
* 2020/206:07:36:59.0000 AMCS Cal over open ocean Duration 2 minutes
  2020/206:09:00:48.0000 Segmented RTWscan Part 1 Duration 37 minutes
  2020/206:09:50:05.0000 Segmented RTWscan Part 2 Duration 35 minutes
  2020/206:10:30:43.0000 Segmented RTWscan Part 3 Duration 14 minutes
* 2020/206:12:30:04.0000 TEP data collection Grid 211 Duration 3 minutes
* 2020/206:13:48:42.0000 TEP data collection Grid 425 Duration 3 minutes
* 2020/206:13:55:57.0000 TEP data collection Grid 317 Duration 3 minutes
  2020/206:15:13:35.0000 TOO TOOid 1591 RGT 447 offpoint 4.68deg Duration 2 minutes
* 2020/206:17:11:58.0000 TEP data collection Grid 204 Duration 3 minutes
  2020/206:19:21:32.0000 OCEANscan Duration 22 minutes
  2020/206:22:17:52.0000 TOO TOOid 1598 RGT 451 offpoint 4.58deg Duration 2 minutes
* 2020/206:23:21:10.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
* 2020/206:23:37:55.0000 TEP data collection Grid 86 Duration 3 minutes
* 2020/207:00:56:34.0000 TEP data collection Grid 300 Duration 3 minutes
* 2020/207:02:25:38.0000 TEP data collection Grid 370 Duration 3 minutes
* 2020/207:02:49:08.0000 TEP data collection Grid 45 Duration 3 minutes
* 2020/207:03:57:18.0000 TEP data collection Grid 404 Duration 3 minutes
* 2020/207:04:12:58.0000 TEP data collection Grid 187 Duration 3 minutes
* 2020/207:05:31:36.0000 TEP data collection Grid 401 Duration 3 minutes
* 2020/207:05:37:02.0000 AMCS Cal over open ocean Duration 2 minutes
  2020/207:07:08:37.0000 OCEANscan Duration 22 minutes

2020/207:08:30:45.0000 TOO TOOid 1592 RGT 458 offpoint 4.73deg Duration 2 minutes
* 2020/207:10:22:18.0000 TEP data collection Grid 322 Duration 3 minutes
* 2020/207:10:43:12.0000 TEP data collection Grid 33 Duration 3 minutes
* 2020/207:12:17:06.0000 TEP data collection Grid 31 Duration 3 minutes
2020/207:14:00:45.0000 TOO TOOid 1599 RGT 461 offpoint 4.57deg Duration 2 minutes
* 2020/207:15:02:33.0000 TEP data collection Grid 351 Duration 3 minutes
* 2020/207:15:07:46.0000 TEP data collection Grid 279 Duration 3 minutes
* 2020/207:15:26:04.0000 TEP data collection Grid 26 Duration 3 minutes
2020/207:18:55:52.0000 OCEANscan Duration 22 minutes
* 2020/207:21:16:29.0000 TEP data collection Grid 378 Duration 3 minutes
* 2020/207:22:55:30.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
2020/207:23:15:00.0000 Laser window dump Duration 2 minutes
* 2020/208:00:29:48.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
* 2020/208:00:49:10.0000 TEP data collection Grid 48 Duration 3 minutes
* 2020/208:01:57:15.0000 TEP data collection Grid 407 Duration 3 minutes
* 2020/208:02:02:35.0000 TEP data collection Grid 334 Duration 3 minutes
* 2020/208:05:11:21.0000 AMCS Cal over open ocean Duration 2 minutes
2020/208:06:30:48.0000 TOO TOOid 1593 RGT 472 offpoint 4.71deg Duration 2 minutes
2020/208:06:42:57.0000 OCEANscan Duration 22 minutes
* 2020/208:08:19:56.0000 AMCS Cal over open ocean Duration 2 minutes
* 2020/208:10:16:38.0000 TEP data collection Grid 34 Duration 3 minutes
* 2020/208:14:39:30.0000 TEP data collection Grid 315 Duration 3 minutes
2020/208:18:30:12.0000 OCEANscan Duration 22 minutes
2020/208:19:52:14.0000 TOO TOOid 1600 RGT 480 offpoint 4.58deg Duration 2 minutes
* 2020/208:20:48:48.0000 TEP data collection Grid 414 Duration 3 minutes
* 2020/208:22:31:52.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
* 2020/209:00:04:07.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
* 2020/209:01:34:17.0000 TEP data collection Grid 371 Duration 3 minutes
* 2020/209:04:45:41.0000 AMCS Cal over open ocean Duration 2 minutes
2020/209:06:17:17.0000 OCEANscan Duration 22 minutes
* 2020/209:07:54:16.0000 AMCS Cal over open ocean Duration 2 minutes
2020/209:09:18:05.0000 Segmented RTWscan Part 1 Duration 37 minutes
2020/209:10:07:09.0000 Segmented RTWscan Part 2 Duration 35 minutes
2020/209:10:47:50.0000 Segmented RTWscan Part 3 Duration 14 minutes
2020/209:18:04:31.0000 OCEANscan Duration 22 minutes
2020/209:21:48:00.0000 TOO TOOid 1594 RGT 497 offpoint 4.75deg Duration 2 minutes
* 2020/209:23:38:27.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes
2020/210:00:09:28.0000 TOO TOOid 1601 RGT 498 offpoint 4.61deg Duration 2 minutes
* 2020/210:04:26:24.0000 AMCS Cal over open ocean Duration 2 minutes
2020/210:05:51:36.0000 OCEANscan Duration 22 minutes
* 2020/210:07:28:35.0000 AMCS Cal over open ocean Duration 2 minutes
* 2020/210:09:18:19.0000 TEP data collection Grid 143 Duration 3 minutes
2020/210:09:35:11.0000 TOO TOOid 1602 RGT 504 offpoint 4.61deg Duration 2 minutes
2020/210:13:30:53.0000 TOO TOOid 1595 RGT 507 offpoint 4.72deg Duration 2 minutes
2020/210:19:13:08.0000 OCEANscan Duration 22 minutes
* 2020/210:23:12:47.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes

2020/211:02:05:14.0000 TOO TOOid 1596 RGT 515 offpoint 4.71deg Duration 2 minutes
* 2020/211:04:13:39.0000 AMCS Cal over open ocean Duration 2 minutes
2020/211:04:26:38.0000 TOO TOOid 1603 RGT 516 offpoint 4.56deg Duration 2 minutes
* 2020/211:05:28:38.0000 AMCS Cal over open ocean Duration 2 minutes
2020/211:07:00:13.0000 OCEANscan Duration 22 minutes
2020/211:18:47:28.0000 OCEANscan Duration 22 minutes
* 2020/211:22:47:07.0000 AMCS Cal over open Atlantic ocean Duration 2 minutes