

# ATL02 Known Issues & Advisories List

Applicable Version: Release 006

Last Updated: April 18, 2023

## **ADVISORIES**

- The algorithm window used for transmitter echo identification is 100ns wide. The DLB width of an exclusively TE-seeking band is ~170ns wide. Thus, when plotting the ground return photon cloud and filtering out the suspected TE returns, it may give the appearance of a thin, flat cloud with its middle 100ns portion missing. See ATL02 ATBD section 4.5.
- The `tof_flag` values incorporate information about the start centroid calculation as well as identifies if the return is a suspected TEP. See ATL02 ATBD sections 3.4.5 and 4.5 respectively.
- When plotting the return TOFs as a photon cloud, it is possible to see returns occurring outside the boundaries of the DLB. This is an expected behavior. See ATL02 ATBD section 3.8.5.
- The laser gives valid preamp voltage and current telemetry at energy level 0 and 6 or above. At levels 1 through 5, it gives 0 or previously valid stale values. See ATL02 ATBD section 8.4.
- An error condition in ATLAS has occurred more than once, in which some of the start time data telemetry is incorrect. The ATL02 code was modified in Release 3 to detect the condition and compute ATL02 correctly; see IssueID 005 below.
- An error condition in ATLAS has occurred more than once, in which the association between the transmit and receive data streams slips by one laser shot interval. This causes a time of flight error that varies periodically between about 1 ns and about 10 ns. Current instances of this error are not being released, but it has been found in previously released data. It was screened out of Release 4; code was added to detect and correct this condition in Release 5.
- Calibration data products used in the computation of time of flight were updated for Release 006. This results in small changes in time-of-flight values between Release 005 and Release 006, and a small narrowing of their distribution.
- An incorrect calibration file was used for the nominal receiver sensitivity, which in turn affects the return and background sensitivities stored in ATL02 under `/atlas/housekeeping/radiometry/`. The sensitivities can be corrected by multiplication with a spot-dependent correction factor (see also issueID 009): Correction factor for spots 1 to 6 are [1.0253, 1.1145, 0.9573, 1.1431, 1.0113, 1.0237].

## **KNOWN OPEN ISSUES**

|                                    |   |
|------------------------------------|---|
| IssueID                            | 009 – Incorrect calibration file used for nominal receiver sensitivity  |
| Release #<br>When First Identified | 002   |
| Description                        | The CAL-30 (nominal rx sensitivity) values in releases 2 through 6 were picked based on temperature instead of detector side. Calibration values for side B were used throughout the mission, instead of values for side A. This resulted in incorrect values of return and background sensitivities, which rely on CAL-30. The sensitivities can be corrected by multiplication with a spot-dependent correction factor. The correction factors for spots 1 to 6 are [1.0253, 1.1145, 0.9573, 1.1431, 1.0113, 1.0237]. |
| Impact(s)                          | Documentation: none<br>Product: ATL02<br>Calibration: 30  |
| Notes                              | Will be corrected in Release 007  |
| Status                             | Open  |

## **ISSUES RESOLVED IN RELEASE 006**

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|------------------------------------|--|
| IssueID                            | 008 – Throughput vs. TX/RX misalignment incorrectly computed |
| Release #<br>When First Identified | 005  |

|             |  |
|-------------|--|
| Description | The computation of ATLAS throughput as a function of transmit/receive misalignment was incorrect, due to an incorrect implementation of the algorithm. This resulted in large changes in the computed receiver sensitivity that did not correspond to reality. |
| Impact(s)   | Documentation: none<br>Product: ATL02<br>Calibration: N/A  |
| Notes       | Corrected in Release 006   |
| Status      | Resolved   |

### ***ISSUES RESOLVED IN EARLIER RELEASES***

|                                    |   |
|------------------------------------|---|
| IssueID                            | 001 - Calibration product(s) using incorrect toggle information   |
| Release #<br>When First Identified | 001   |
| Description                        | The version of CAL-49 used in release 001 has reversed the rising + falling skew corrections. The impact of this issue is that TEP histograms will be broadened by ~50ps. |
| Impact(s)                          | Documentation: ATL01 ATBD, ATL02 ATBD, ATL03 ATBD<br>Product: ATL02, ATL03<br>Calibration: 17, 49   |
| Notes                              | Corrected in Release 002  |
| Status                             | Resolved  |

|                                    |   |
|------------------------------------|---|
| IssueID                            | 002 – Documentation Missing for Groups  |
| Release #<br>When First Identified | 001   |
| Description                        | The following groups are not documented in the ATBD: <ul style="list-style-type: none"> <li>• <i>/atlas/housekeeping/time_at_the_tone</i></li> <li>• <i>/atlas/pcex/background</i></li> </ul> <p>Contents of group has been verified and are as expected.</p> |
| Impact(s)                          | Documentation: ATL02 ATBD<br>Product: N/A<br>Calibration: N/A   |
| Notes                              | Corrected in Release 002  |
| Status                             | Resolved  |

|                                    |  |
|------------------------------------|--|
| IssueID                            | 003 – Improper Temperature Reference for CAL-54 Selection  |
| Release #<br>When First Identified | 001  |
| Description                        | In the ATL02 ATBD as well as in the ASAS production code, the laser optics radiator temperature is called out for use with CAL-54 when computing transmitted energy from LRS laser spot magnitudes. According to the CAL-54 CPD, CAL-54 was derived using “APID 1120, A_LRS_HK, ANALOGHK channel 33, LRS Laser Detector Card Thermistor”. This appears in ATL01 as <i>/lrs/hk 1120/raw ldc t</i> . |
| Impact(s)                          | Documentation: ATL02 ATBD<br>Product: ATL02<br>Calibration: N/A  |
| Notes                              | The code and the documentation updated to match CAL-54 for Release 002.  |
| Status                             | Resolved   |

|                                    |   |
|------------------------------------|---|
| IssueID                            | 004 – Improper Misalignment Calculation   |
| Release #<br>When First Identified | 001   |
| Description                        | In the ATL02 ATBD as well as in the ASAS production code, the misalignment between the transmitter and the receiver is calculated incorrectly in Equation 5-13. The misalignment is used to estimate the receiver's sensitivity to return energy. The offset value from ANC27 is used as the misalignment, rather than the change in offset value. This can result in an overestimate of the optical throughput loss due to misalignment, and an underestimate of the return sensitivity. |
| Impact(s)                          | Documentation: ATL02 ATBD, Section 5.3.3.1<br>Product: ATL02<br>Calibration: N/A  |
| Notes                              | Corrected in Release 003  |
| Status                             | Resolved  |

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| IssueID                            | 005 – Start Time Swap  |
| Release #<br>When First Identified | 002  |
| Description                        | On two occasions, ATLAS entered an error condition in which the leading-lower and "other" start time data on one PCE were swapped. The error was manifested in ATL01 as a swap of the leading-lower and "other" fine counts on the affected PCE, and the "other" coarse count appearing as the leading-lower coarse count; the start marker was unaffected. The result in ATL02 was a periodic error in the start time, and incorrect receive times in the spots on the affected PCE. The error was cleared by resetting the PCE, and functionality was added to the ATL02 software to detect the symptoms of this error condition in the ATL01 data and correctly compute the start times and times of flight in ATL02. The correction code was inserted as a "hot fix" late in Release 002 and documented in Release 003. The QA parameter <i>qa s n swapped txfine</i> indicates when this error is detected. |
| Impact(s)                          | Documentation: ATL02 ATBD, Section 3.4.3<br>Product: ATL02<br>Calibration: N/A   |
| Notes                              | Corrected in Release 003   |
| Status                             | Resolved   |

|                                    |   |
|------------------------------------|---|
| IssueID                            | 006 – GPSR IMT  |
| Release #<br>When First Identified | 003   |
| Description                        | Based on analysis performed by the POD group, the GPSR/time_correlation/IMT datatype was insufficient to represent the full precision of the measurements. The datatype was changed from 'double precision' to '64-bit integer' and the units were changed to 'counts'. |
| Impact(s)                          | Documentation: ATL02 ATBD<br>Product: ATL02<br>Calibration: none  |
| Notes                              | Corrected in Release 004  |
| Status                             | Resolved  |

|                                    |   |
|------------------------------------|---|
| IssueID                            | 007 – TX/RX Slip  |
| Release #<br>When First Identified | 003   |
| Description                        | On several occasions, the transmit and receive data streams have slipped by one shot. This has been traced to a condition where a PCE state change occurs while one strong/weak range window is open and the other is closed. |

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| Impact(s) | Documentation: ATL01 ATBD, ATL02 ATBD<br>Product: ATL02<br>Calibration: none |
| Notes     | Was screened out in Release 004 and corrected in Release 005.                |
| Status    | Open   |