

## **ATL06 release 004 known issues. April 12, 2021**

### **Uncertainties in geolocation**

Some components of the error propagation algorithms for ATL03 have not yet been implemented. To avoid providing incorrectly optimistic estimates of the horizontal geolocation uncertainty and the vertical uncertainty to which it is propagated, fixed, pessimistic (20-m) values of the geolocation uncertainty are reported on release 004. Additionally, a parameter for radial orbit error (*sigma\_geo\_r*) that is expressed at a static value (30 cm) for each land ice segment has been added to ATL06 for release 004.

We expect that subsequent release will have more precise values reflecting the true accuracy of the measurements: based on calibration/validation activities, uncertainties in geolocation for release 004 are typically less than 10 m.

### **Spurious trends in the data**

Released data are calibrated to temporal trends smaller than 1 mm/day. As calibration exercises are completed, those data will be used to produce timing-bias models that will stabilize temporal trends in the beam to be on the order of a few mm/yr.

### **RGTs with significant off-pointing over the ice sheets**

Before the middle of cycle 7 (~April 2020) calibration maneuvers known as Round-the-World scans (RTWs) were conducted that resulted in substantial off-nadir pointing for a subset of tracks in Antarctica and Greenland. Data collected while ATLAS was pointed away from the RGTs have substantially larger height errors than do data collected while pointing at nadir. These data may be identified by checking the ATL06 *y\_atc* parameter. Any segment with *y\_atc* larger than 10 km should be suspected of having height errors on the order of 0.2-0.5 m.

### **Data gaps due to Tx/Rx slips and degraded POD/PPD**

Some ATL06 granules that were present in release 003 are missing in release 004. This is due mostly to newly-found instances where the components that make up photon times were misregistered, leading to incorrect heights. A second source of missing ATL06s in Rel004 are data that was culled due to degraded precision orbit determination (POD) and precision pointing determination (PPD) solutions. Users should refer to the data gaps table, available on NSIDC, for a complete list of missing data for all ICESat-2 products.

### **Surface window errors, July 6-26, 2019**

In the period July 6-26, 2019, a timing error in the ICESat-2 flight software led to compromised tracking of the surface by the on-board software. Data from this period may have fewer detected ground returns and have somewhat larger (by a few cm) height errors in parts of Antarctica and Greenland. These data were first released in August 2020.

## **Infinite values in the data**

In release 004 of ATL06, there are land ice segments which are flagged as valid (*atl06\_quality\_summary* is set to zero) that contain infinite values for some of the variables. These values were introduced by numerical anomalies in the processing code and should be considered invalid. The infinite values are represented using the IEEE 754 standard and can be found using, for example, the `np.isinf` test in Python or a similar function in other programming languages. The infinite values are distinct from invalid data values, which are represented in the data as the largest representable number for the variable's data type.