

*Pro Team releases 06.03 and 06.04 went into the ground system (see final section). PR06.03 included a fix to GLM Data Burst Filter which fixed the issue of crash induced empty files. This document now lists nearly all WRs requiring resolution prior to full validation.*

This document lists all known GLM-related changes to the Ground System (GS) software since initial deployment. The GS makes fixes through series of ADRs and WRs. Some fixes are minor while others take longer to diagnose and remedy. The WRs are implemented in new versions of the GS software that are first deployed in the Development Environment (DE) then the Operational Environment (OE). New versions are indicated by three sets of integers (e.g., DO 04.04.02). The first is the GS software version, the second indicates software patches, and the third signifies emergency patches. The Product Readiness and Operations (PRO) team developed a system to integrate less complicated fixes into the GS outside of the more rigorous GS process. The PRO team makes changes to the GS software and releases (PR) patches that follow the same numbering system. Most updates to the lookup tables (e.g., Rev G LUTs) follow the PR path. In terms of priority, every indication has been that the GLM falls low on the list (ABIs little brother), which often results in schedule slips for the GLM-specific WRs. The following list is complete as of the date referenced above, and this document will be periodically updated and uploaded to the Cal/Val portal.

**Ground System Update Schedule:**

DO 04.02.00 – 1/13/17 – 1500UTC  
DO 04.03.00 – 2/17/17 – 2153UTC  
DO 04.04.00 – 4/24/17 – 1952UTC  
DO 04.04.01 – 4/24/17 – 1952UTC  
DO 05.00.00 – 7/24/17 – 1700UTC  
DO 06.00.00 – 10/31/17 – 1722 UTC  
DO 06.01.00 – No GLM updates  
DO 06.02.00 – 11/28/17 – 1646 UTC  
DO 07.00.00 – June 2018

**WRs Resolved in DO.04.02**

- WR 1948: GLM Group Energy Values are all set to the minimum value
- WR 1950, 1948, 2284: GLM energy discrepancies
- WR 2232: Write GLM L1b Intermediate Product to the 2 day store
- WR 2267: Improve GLM LCFA algorithm error-handling
- WR 2284: Different units between GLM L1b and GLM L2 - ADR 91
- WR 2643: GLM L0 Processing receiving out of order packets
- WR 2834/2728: GSIT3-2 : GRB Incr. Turn-on Requires Update to GRB Assembly Start Scripts
- WR 1935: GLM Eastern RTEP mapping appears incorrect
- WR 1937: GLM L2+ product metadata errors
- WR 2376: Apparently spurious error logged from GLM L0 services

- WR 2411: Intermittent "bad\_alloc" errors in GLM L1 Geolocate
- WR 3498: GLM RPY measurement instrument activities in the PM DB are not associated with the GLM Background Image.
- WR 3502: GLM background image navigation grids are incorrect
- WR 3556: Update GLM Navigation Parameters
- WR 3557: Update GLM RTEP Map

#### **WRs Resolved in DO.04.03**

- WR 3315: Zero Pixels at RTEP corners in GLM Background Image
- WR 3702: GLM not producing background images

#### **WRs Resolved in DO.04.04.00/01**

- WR 1949: GLM appears to have Timing Artifacts
- External WR 2061: GLM OP - Change Event Filter Order to match GLM CDRL-80 Rev F
- External WR 2063: GLM OP - Implement Overshoot Filter
- External WR 2064: GLM OP - Implement Solar Glint Filter
- External WR 2065: GLM OP - Implement Crosstalk Filter
- External WR 2066: GLM OP - Update event energy computation
- External WR 2067: GLM OP - Update Block-Level Metadata
- External WR 2068: GLM OP - Update INR Implementation to GLM CDRL-46 Rev H
- WR 2234 ADR118: Event and group count variables differ from the events, group data arrays
- WR 3033 ADR 150: GLM L2+ start/end times incorrect, ETE4b using MVTDS-Synthetic data
- WR 3339: GLM INR Prototype water mask differs from independent matlab implementation
- WR 3749, 4140: GLM L0 Event Processing Errors when handling maximum event rates
- WR 4255: SOZ DE DO.04.04.00 GLM LCFA file names have invalid start/end date times and don't meet latency requirements

#### **WRs Resolved in DO.05.00**

- WR 1935: GLM Eastern RTEP mapping appears incorrect
- WR 1937: GLM L2+ product metadata errors
- WR 2376: Apparently spurious error logged from GLM L0 services
- WR 2411: Intermittent "bad\_alloc" errors in GLM L1 Geolocate
- WR 3498: GLM RPY measurement instrument activities in the PM DB are not associated with the GLM Background Image
- WR 3502: GLM background image navigation grids are incorrect
- WR 3556: Update GLM Navigation Parameters
- WR 3557: Update GLM RTEP Map

#### **WRs Resolved in DO.06.00**

- ADR 385, WR 5140: Banded Structure in Group Geolocation GLM L2 – Fixed “Charlie Brown” stripes in L2 groups – also should greatly reduce the splitting of individual GLM flashes
- WR 2062: GLM OP - Implement data formatter burst filter

- WR 2691: Abnormally large group areas in the L2+ products
- WR 3669: GLM downsampled background (DBG) image does not contain radiance fill values
- WR 4017: GLM INR update to CDRL 46 Rev K (ADR 227)
- WR 4330: Empty Objects GLM L0 Service produces empty objects after a data gap
- WR 4589: Time offset of events, groups and flashes, GLM L2+ (only corrected in L1b)
- WR 4709: GLM CALINR update to CDRL 79 Rev H

#### **WRs Resolved in DO.06.01**

#### **WRs Resolved in DO.06.02**

- WR 4762: Radiation 'dots', removing single-group flashes
- WR 4780: Duplicate events - Duplication dots are no longer present
- WR 5162: GLM E-W Event Navigation Error
- WR 5284: Interim solution - GLM Event Geolocation Does Not Match Vendor Results

#### **WR Resolutions scheduled for DO.07.00**

- WR 3407: GLM Background Image Metadata Doesn't Match PUG
- WR 4477: GLM L2 LCFA product has 'n/a' for production\_data\_source
- WR 4507: Use adjusted event times in Lightning L2+ product ADR 338
- WR 4696: Group and flash areas GLM L2 – ADR 382 (20% discrepancy GS vs LM)
- WR 5016: GLM Coastline algorithm falls behind, BG images are missed

#### **WR Requiring Resolution Prior to Full Validation**

- WR 4695: Family Links, GLM L2 – ADR 376
- WR 4697: Update Blooming Filter, GLM L2
- WR 4705: Time Order, GLM L2 – ADR 375
- WRyyyy: Implementation of APID255 for GLM GPA
- WRzzzz: GLM INR update to CDRL 46 Rev L
- WR 4758: GLM Event Geolocation Does Not Match Vendor Results – ADR 373
- WR 4693: GLM L2 Filtering out all events in ABI TVAC HTT data
- WR 5232: GLM Clustering Errors – ADR 460 – PRO Release Type 2 (flash splitting)
- WR 5244: Non ABI instruments metadata contain non-ascii quote marks – PRO Rel Type 1
- WR 5426: GLM L1b Overshoot and Second Level Issues – ADR 502 PRO Release Type 1
- WR 5480: GLM Lightning L2 Radiation filter threshold - ADR 519
- WR 5481: GLM L1b update to CDRL 80 Rev G – ADR 520
- WR 5525: Orphan and childless events and groups in GLM L2 – ADR 376
- WR 5545: GLM L1b LUT Update for East – ADR 538 PRO Type Rel 1
- ADR 204: “\_unsigned integer” issue for multiple instruments (swallowed ADR 384 & its WR 5170 regarding negative flash areas)
- ADR 461: GLM L2 Data Quality Product
- Parameter updates for CDRL79: Diurnal Variation INR
- Parameter updates for CDRL79: Parallax compensation

## Select Pro-Release Patches (Not a complete list)

PR 04.04.07 – 6/28/17 – 2000UTC GLM Rev G LUTs

PR 05.00.01 – 9/07/17 – 1841 UTC GLM Rev H LUTs

### Changes in Rev H compared to Rev G

- Set second level threshold to min threshold for each RTEP
- Implemented Overshoot Filter LUT
- Adjusted Glint Filter parameters
- Adjusted Contrast Leakage parameters
- Adjusted Coherency Filter parameters: probability table based on on-orbit thresholds and higher amplitudes remaining after the second level threshold removes low amplitude events
- Adjusted Frame Transfer parameters
- Incorporated scaling changes into temperature conversion coefficients to mitigate focal length calculation errors that were causing nav issues (significant change)

PR 06.00.02 – 11/21/17

- L2 event time now has changed scale factor to 1 millisecond

**PR 06.03.00 – 12/15/17**

- **ADR 538 - GLM LUT update for East. Update to glint filter spot amplification and contrast leakage GS param, \*\*\*Included fix to GLM Data Burst Filter – fixed issue of crash induced empty files\*\*\***

PR 06.04.00 – 12/14/17

**PR 06.05.00 – 1/10/18 – 21:46 UTC**

- **ADR 502 - Improves the GLM L1b algorithm by fixing the second level threshold filter and the overshoot filter. A new rpm is installed to fix these issues.**