GLAST Large Area Telescope:

LAT Status and Observatory Integration

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LAT Status Highlights

- Root cause of LAT reboots was determined and corrected in May.
  - Approx. 600 hours of operation without reboot
- FLIGHT SOFTWARE COMPLETE!!
  - Flight Software baseline version, B1-0-1, has been installed and verified on LAT – July 14th.
  - Includes initial GRB algorithm and infrastructure
  - Flight Software has met all of its requirements – July 10th dFQT
- With B1-0-1 FSW, Online and ISOC deployed more flight-like LAT configuration tools using MOOT/MOOD database
- ISOC tools and procedures for LAT mission operations
  - End-to-End Test #1&2 July 6-7
    - Observatory flight-like operations in GSFC Mission Operations Center (MOC) via TDRSS communications.
    - ISOC team in the MOC successfully powered up LAT and collected physics data using flight operations scripts and tools.

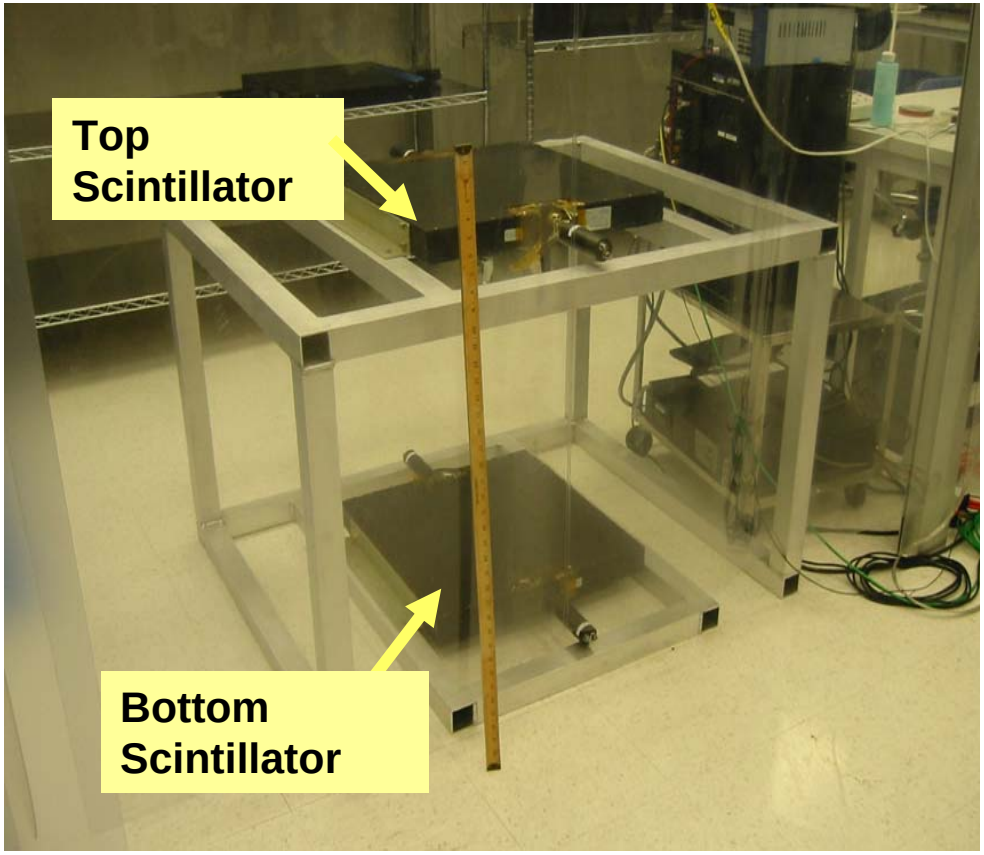
LAT Status

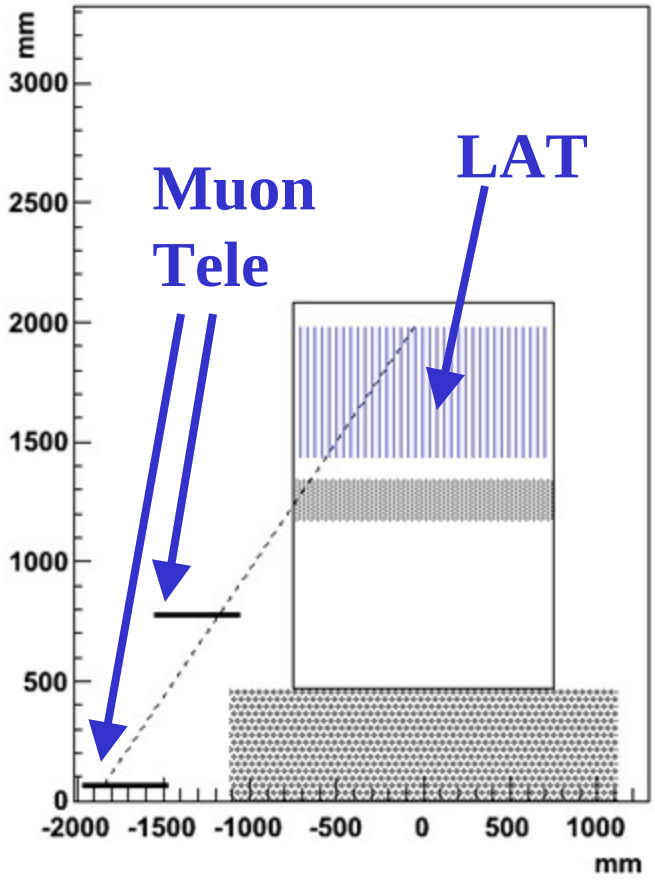
- 1st Comprehensive Performance Test (CPT) of Observatory completed May 2007.
  - No LAT performance issues just test procedure and script issues.
  - Performance of LAT installed on the observatory is essentially the same as delivery.
- Began Environmental Testing May 29, 2007
  - First Tests – EMI/EMC
  - Post EMI CPT completed July 28th
  - Preparing for Dynamics testing

Verification Absolute Time Accuracy

- David Smith, Eric Grove, and Eric Siskind
- Observatory requirement (S/C-LAT ICD)
  - GPS locked mode
    - pulse per second within +/-1.5 usec of absolute
  - Free wheeling mode (no GPS lock)
    - Drift rate < +/-1 usec in 100 sec
- Plan: Correlate muon trigger times in external muon telescope with muons in LAT
  - External muon telescope has independent GPS timing system
  - Track reconstruction identifies muons that should traverse muon telescope
  - Correlate data streams and measure trigger time differences.

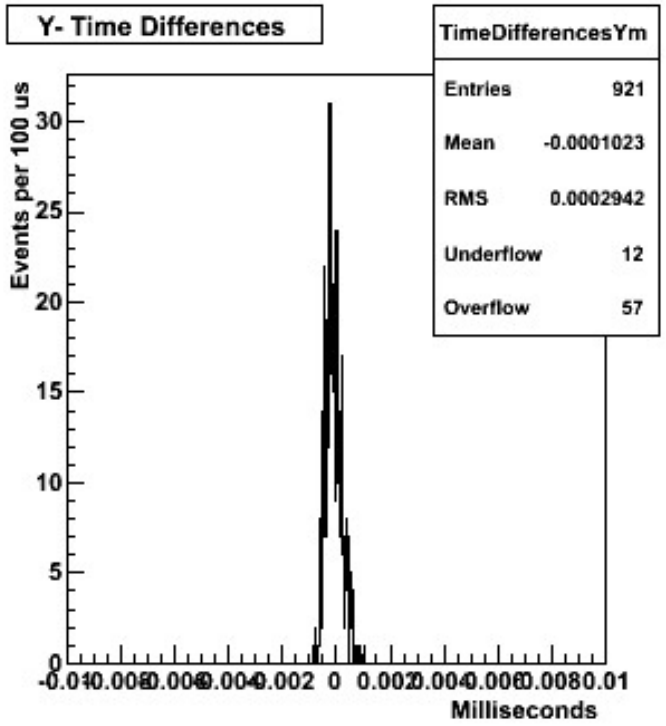
CAL Muon Telescope + Stand

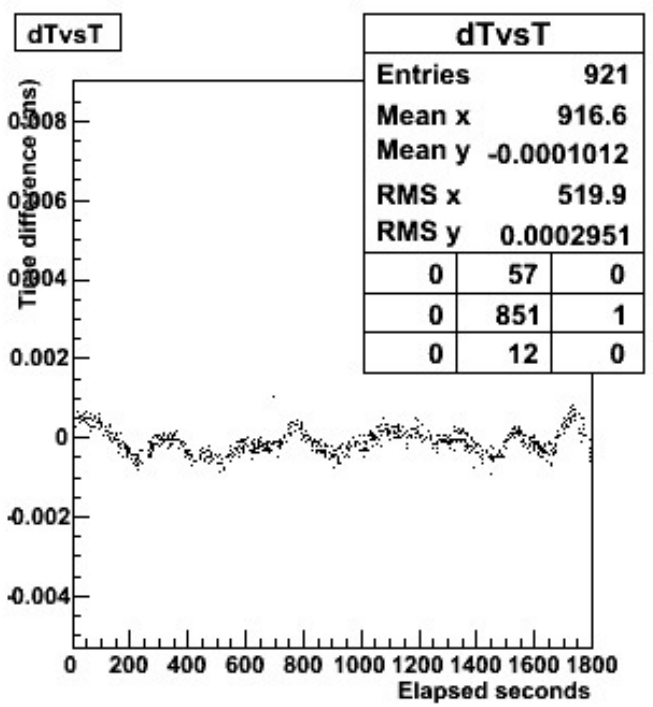




50 x 50 cm plastic scintillator paddles

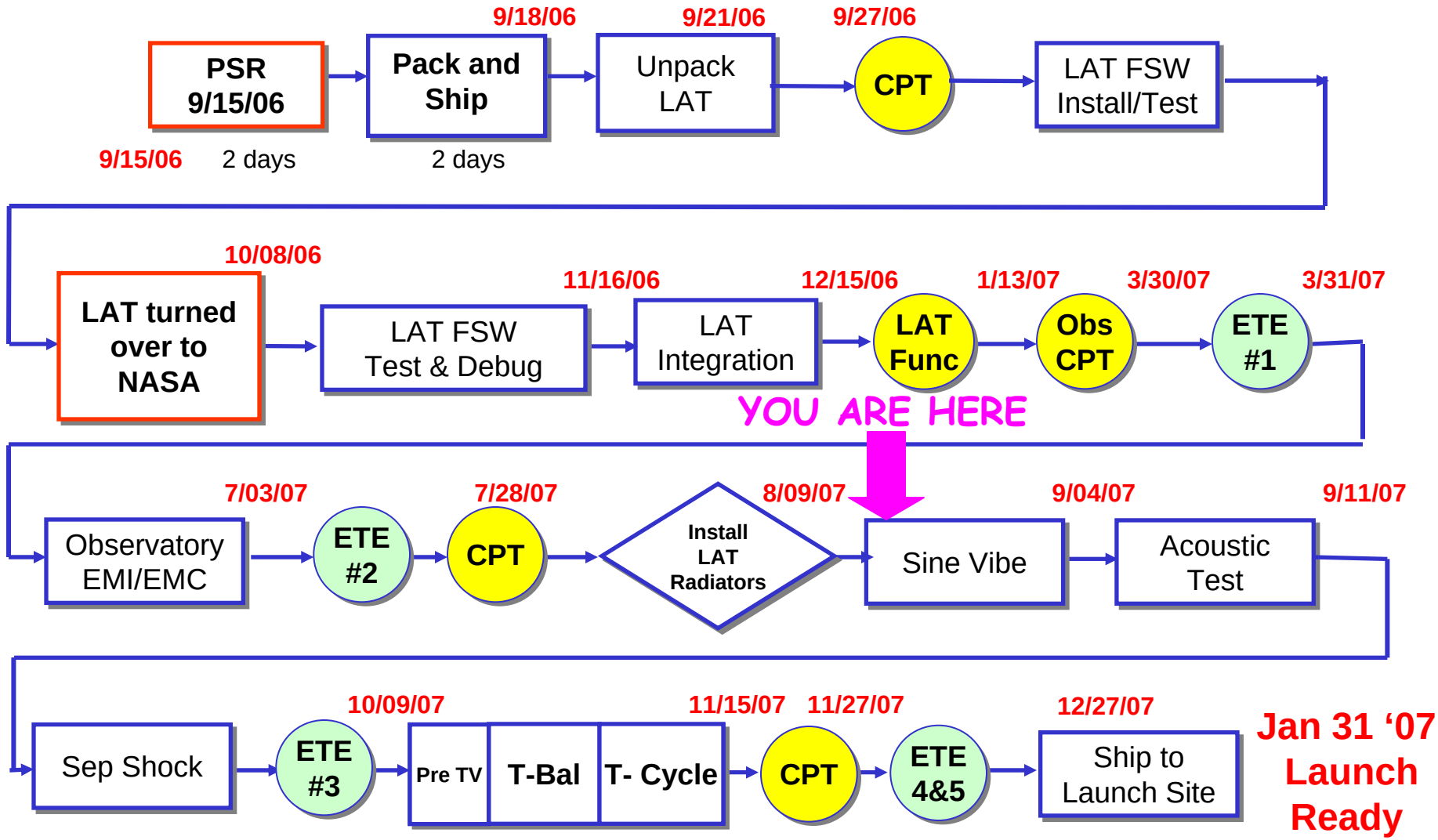
Absolute Time Test – GPS Locked





- Left plot – histogram of trigger time differences- LAT vs external
  - Well within +/- 1.5 usec (sigma ~ 0.3 usec)
- Right plot – trigger time difference vs time in run (1800 secs)

LAT Future – General Dynamics and beyond



The future dates are approximate – a conflict for GD TVAC usage is being negotiated.

Summary

- LAT continues to support Observatory integration and test.
  - Baseline LAT FSW has been completed and successfully installed on LAT
  - LAT performance remains nominal without significant anomalies.
- LAT Online and ISOC have made significant progress in configuring and operating LAT in flight-like environments
- Many thanks to the FSW team – Jana, Gregg, JJ, Tony, Mike, Owen, Sergio, Dan, Don, Kim, Shantha – and Eric Siskind in resolving reboots and completing the baseline FSW delivery
- LAT team (David Smith, Eric Grove, Eric Siskind) has made a significant contribution to Observatory integration and test by verifying absolute time accuracy
  - proposing a test that would verify the requirement
  - building the test configuration and discovering a problem in the observatory timing software
  - helping GD identify and fix the problem.