

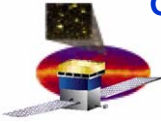
GLAST Large Area Telescope

Systems Engineering

Test Status, NCRs and Verification Status

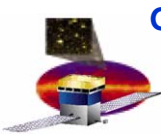
Pat Hascall
Systems Engineering
Joe Cullinan
Quality

Stanford Linear Accelerator Center



LAT Test Status

- Radiator Installation Electrical test completed
- Performed Absolute Time Retest
- Performed Pre Vib Aliveness Test
- Performed Post Z Axis Aliveness Test
- Performed Post XY Axis Aliveness Test
- Performed Post Shock Aliveness Test
 - Included no chiller test to assess margin for launch base operations
- Issues seen
 - Thermistor swap
 - Blob in recon plot
 - FREE 5 power up

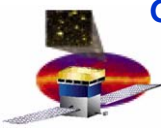


Thermistor Swap

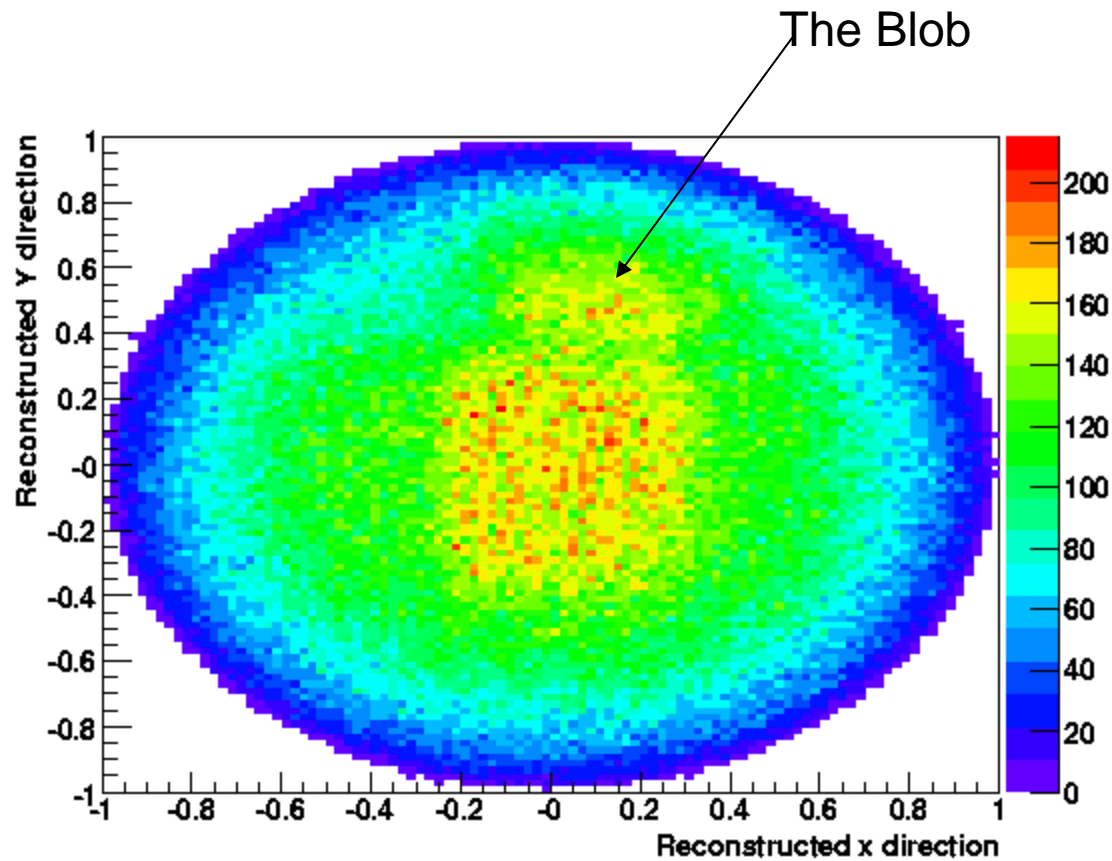
- **Issue**
 - During aliveness test data review, thermistors were observed to be swapped as follows:
 - L_MCH_PY_R_HTRV and L_MCH_PY_P_HTRV
 - L_MCH_NY_R_HTRV and L_MCH_NY_P_HTRV
- **Analysis**
 - Previous data reviewed and swap was confirmed
 - Continuity of all 4 paths on the spacecraft B side was confirmed
 - Source of the swap has not yet been determined
 - LAT TV test was as expected
 - Spacecraft pre-LAT integration electrical checkout as expected
- **Resolution**
 - Tim is working on a data base update to swap the telemetry points
- **Impacts**
 - None

The Blob

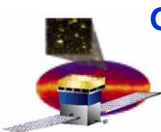
- **Issue**
 - During the post XY vib aliveness test, “The Blob” was seen on one of the recon report plots
- **Analysis**
 - **Background**
 - The digi report is the primary tool for review of science runs
 - The recon report provides a few additional plots
 - One of these plots shows a map of the event trajectories
 - We expect the highest rate of events coming straight down, with the rate falling off away from the vertical
 - Review of plots from the entire sequence (including high bay) indicates that “The Blob” is the door to the test chamber



Post XY Reconstructed Event Direction

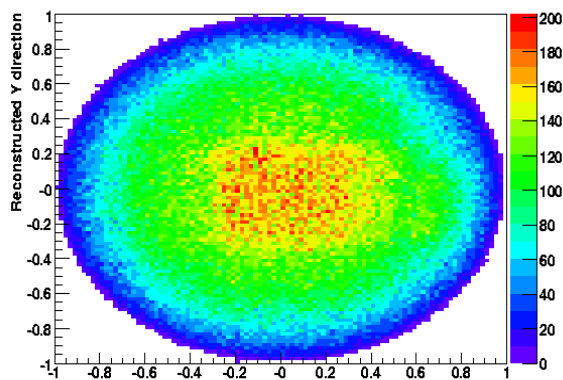
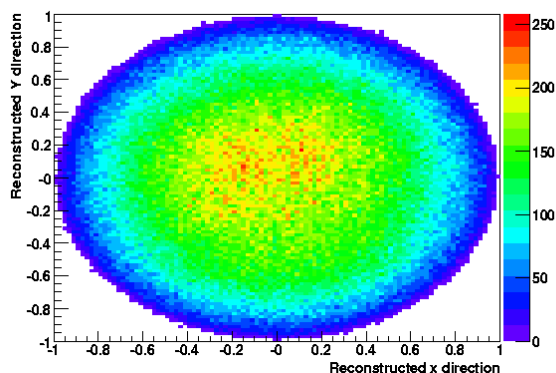


Plot shows counts of events with particular destinations, so events entering a door on the $-x$ side of the LAT show up on the $+x$ side of the plot



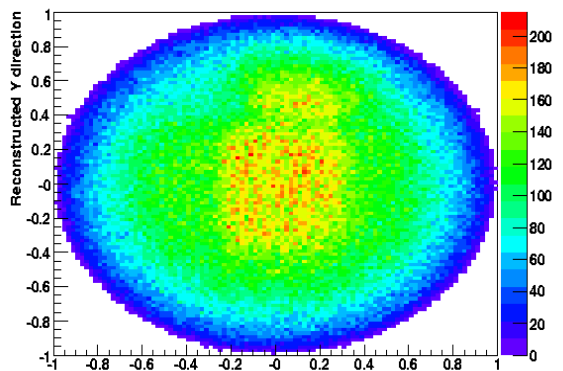
Recon Plot Sequence

High Bay Testing



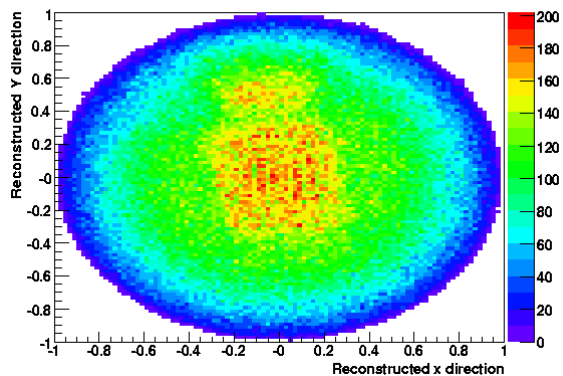
Post Z axis

LAT higher on stand, farther from the door, +x face to west wall. Event counts reduced due to walls



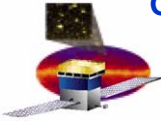
Post XY axis

LAT lowered, moved closer to the door and rotated +y to west wall



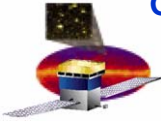
Post Acoustics

LAT centered in the room and slightly rotated for acoustic test



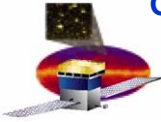
FREE Power Up

- **Issue**
 - During the post XY aliveness test, config 2, FREE 5 had both veto drivers enabled after power up.
- **Analysis**
 - The power up sequence is:
 - FREE card powered
 - Both veto drivers disabled
 - When the bias voltage is set (for all FREE cards) the desired veto driver is enabled
 - With both veto drivers enabled, the 3.3V telemetry is slightly decreased for that FREE card and the 3.3V current sum is slightly elevated
 - Review of historical data in 450 power-ups since early 2006
 - Showed 15 previous incidents starting in September
 - All but 1 using redundant GASU
 - Appears equally likely across FREE cards
 - Likely cause for the redundant GASU cases was determined (courtesy Erik Siskind) and the fix addressed in JIRA FSW-1001
 - The configuration 1 instance is still being investigated
 - Appears to be a power up susceptibility
 - Data from 248 power ups through the primary GASU resulted in a single instance (both FREE 7 and 11)
 - Same command path used for LATC operations (about 400 interactions per run per FREE card), with no issues observed
 - Mechanism not yet understood



FREE Power Up (continued)

- **Resolution**
 - **JIRA-1001 was approved and will be implemented in the next FSW load**
- **Impacts**
 - **In all cases, the FREE card properly responded to the command that sets the bias voltage, resulting in the desired veto driver configuration**



Operating Hours

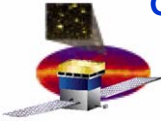
- **As of Sept 4, 2007 the LAT passed 600 operating hours since the timer fix was installed**
- **As of Sept 20, the LAT is at 630 operating hours since the timer fix was installed**
- **B1.0.1 has 209 operating hours**

Unit	Hours
SC-P	1922
SC-R	2111
SIU-P Feed	1965
SIU-R Feed	2068
Pri Htr Feed	1992
Red Htr Feed	2040
SIU-P	1965
SIU-R	2068
GASU-P	1923
GASU-R	2110
EPU-P0	2052
EPU-P1	3910
EPU-R	2104
Towers	4033
ACD	4033
ACD HV1	1947
ACD HV2	2086
+Y HCB	4033
-Y HCB	4033
PDU-P	1967
PDU-R	2066

NCR Summary Status

- **Draft of closure statement for reboot NCRs/QAR prepared, currently in review**

Closure Plan	Definition	Count
Work continuing		
QAR	CND or other issue transferred to a QAR	9



LAT Level Verification Status

Category	Verification Method					Totals	
	Test	Demo	Analysis	Inspection	Children	Complete	% Comp
	# Comp	# Comp	# Comp	# Comp	# Comp		
Requirement Identified	105	63	209	37	44	458	100.0%
Flow Down Complete	105	63	209	37	44	458	100.0%
Draft Verification Plans	105	63	209	37	44	458	100.0%
Final Verification Plans	105	63	209	37	44	458	100.0%
Verification Plans Executed	104	63	194	35	15	411	89.7%
Verification Reports Submitted	104	63	194	35	15	411	89.7%
Requirements Sold	104	63	193	35	15	410	89.5%
Expect Compliance	0	0	0	0	0	0	0.0%
Verifications Plan Deferred	1	0	15	2	29	47	10.3%
Requirements Issues	0	0	0	0	0	0	0.0%
Total VPs	105	63	209	37	44	458	

- **Progress this month**
 - All 458 VPs are Final
 - 1 New VP moved to approved from conditionally approved (EMI test report released)
 - 410 of 411 VPs planned for execution have been approved by GSFC
 - 1 SRD VP (Background Rejection) in work by GSFC
- **Status**
 - VCRM version 27 released
 - All deferred GRB reqts will be sold post FSW B1.0 installation