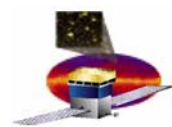


GLAST Large Area Telescope: EM Operations Status

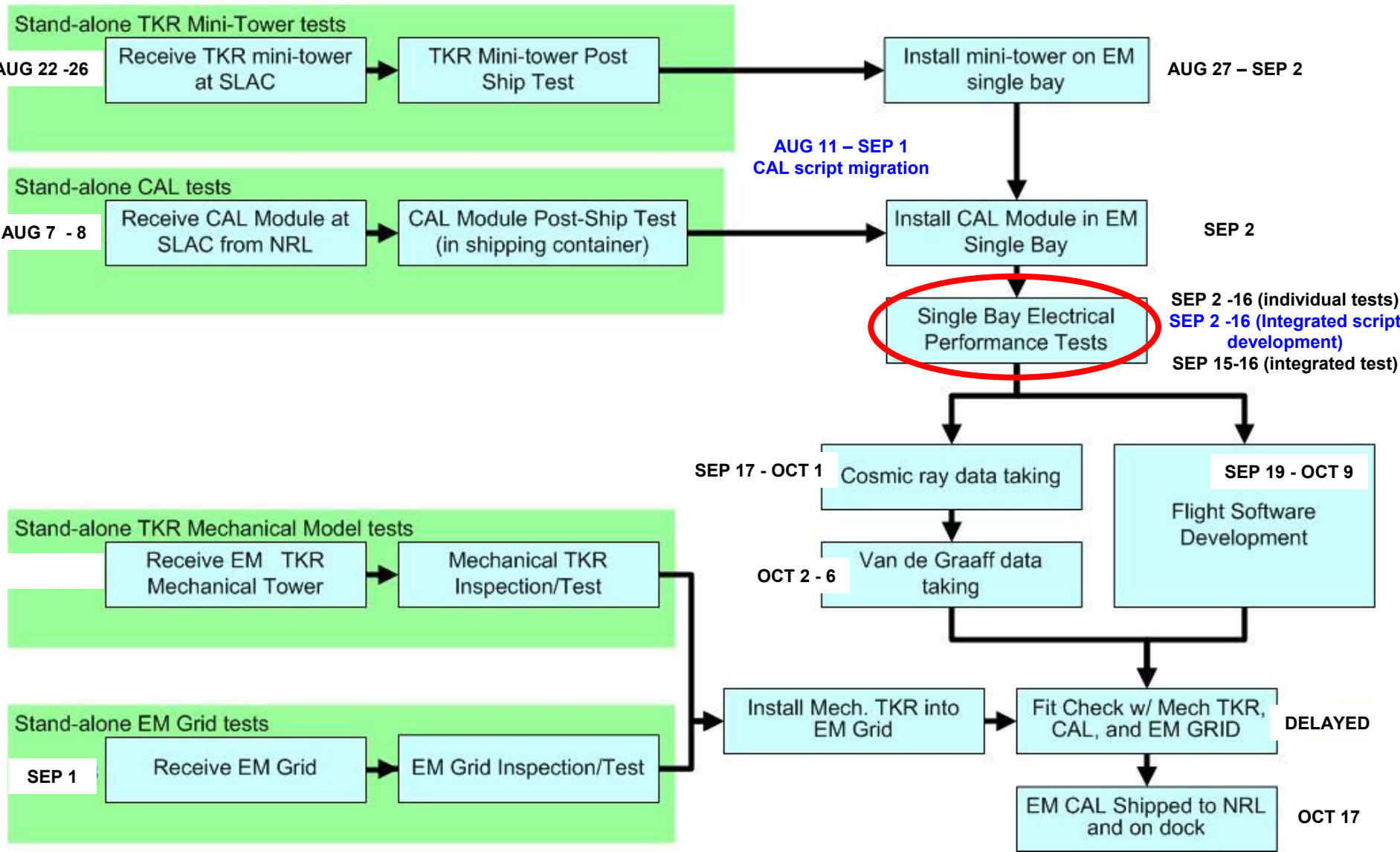
Larry Wai
SU-SLAC

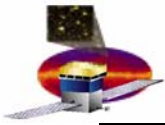
Integration, Facility, Configuration, Test (IFCT)
Manager
(within I&T)

wai@slac.stanford.edu
650-926-3145



Tracker and Calorimeter Integration Tests





Operations Summary

Aug. 21-22

- ✓ Mini-Tower Post-Ship LPT failed X3 and Y3 charge injection occupancy test

Aug. 25

- ✓ Mini-Tower with opaque cover
- ✓ Mini-Tower LPT - X3 and Y3 now pass, but X2 now fails charge injection occupancy test

Aug. 27

- ✓ Mini-Tower fit check on EM single bay
- ✓ Mini-Tower LPT – X2 fails

Aug. 28

- ✓ Mini-Tower De-Integrated
- ✓ Mini-Tower LPT – X2 fails

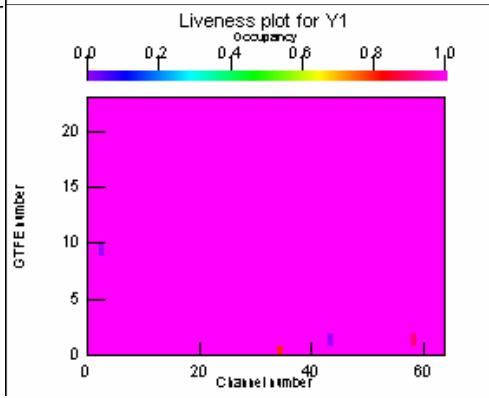
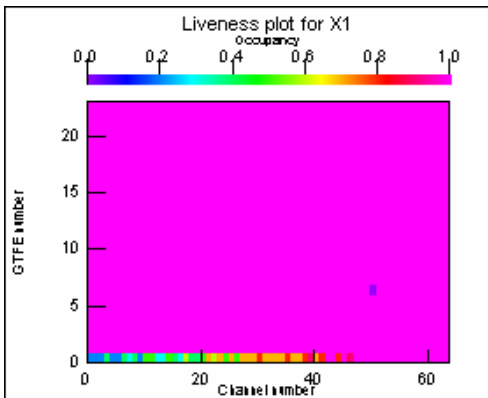
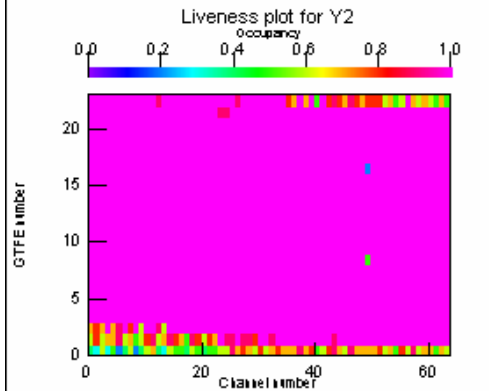
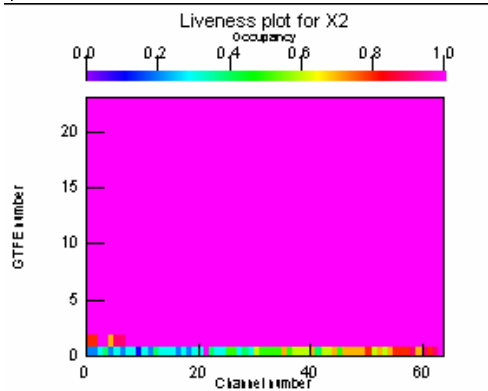
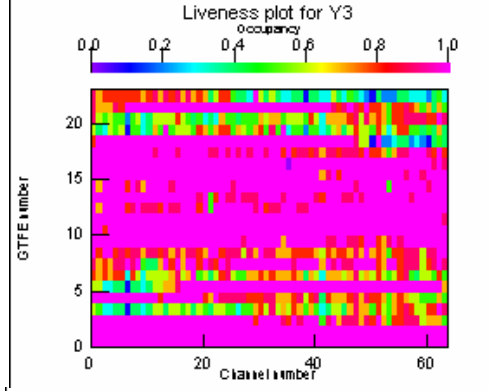
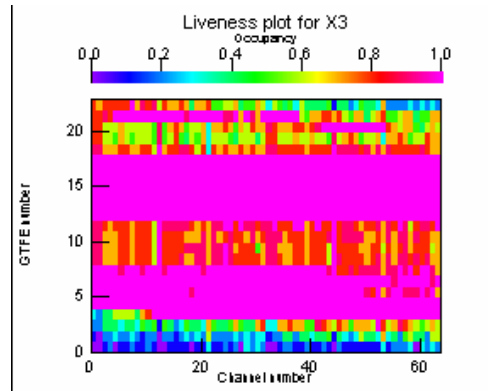
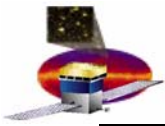
Sept. 2

- ✓ Mini-Tower Integrated
- ✓ Mini-Tower LPT – X2 fails (need to check this)
- ✓ EM CAL Integrated
- ✓ EM CAL LPT passed
- ✓ Mini-Tower LPT – X2 fails (need to check this)

Sept. 8

- ✓ EM CAL De-Integrated
- ✓ EM CAL LPT passed
- ✓ Mini-Tower De-Integrated
- ✓ Mini-Tower LPT – X2 now passes, Y1 now fails!

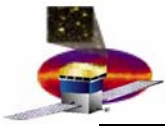
Mini-Tower Aug. 22



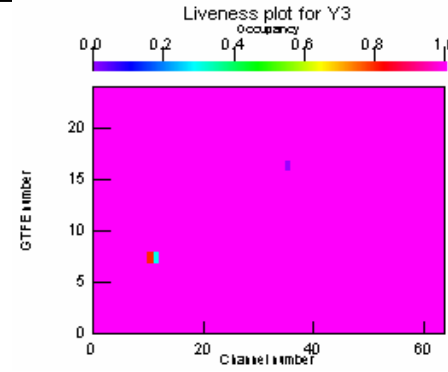
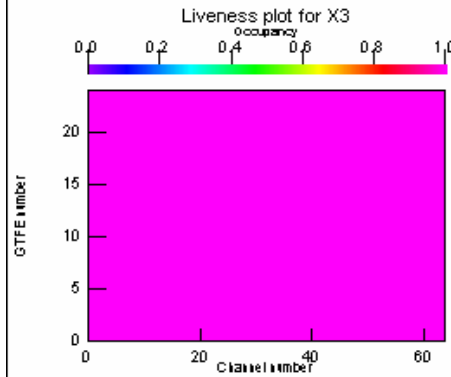
X2 - OK

Threshold = 30
DAC, range 0
Calibration = 60
DAC, range 0

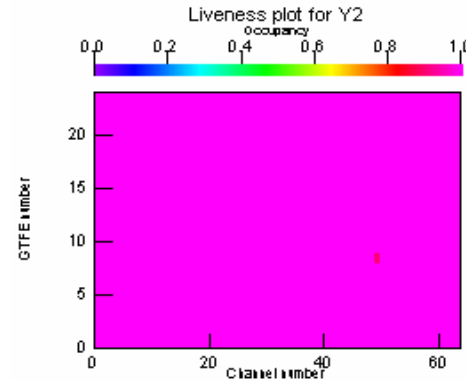
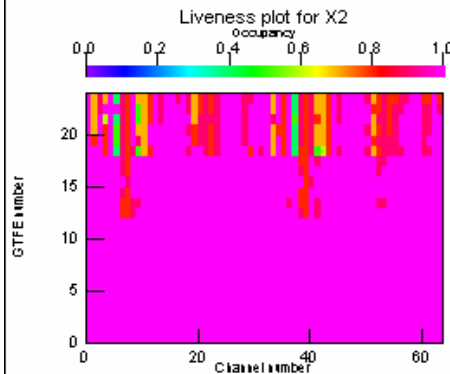
Mini-Tower August 26



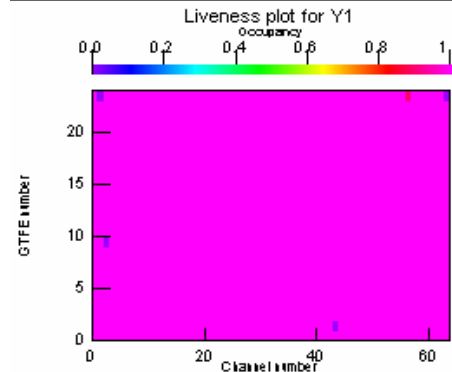
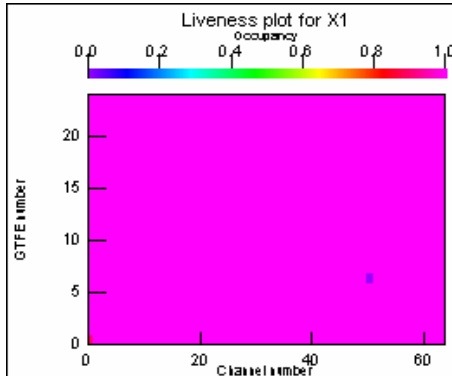
After Mini-Tower
light-tightness
measures
implemented – X3
and Y3 OK

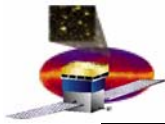


X2 ladders
3 & 4 -
FAILED



Stable results
through 1st Mini-
Tower de-
integration

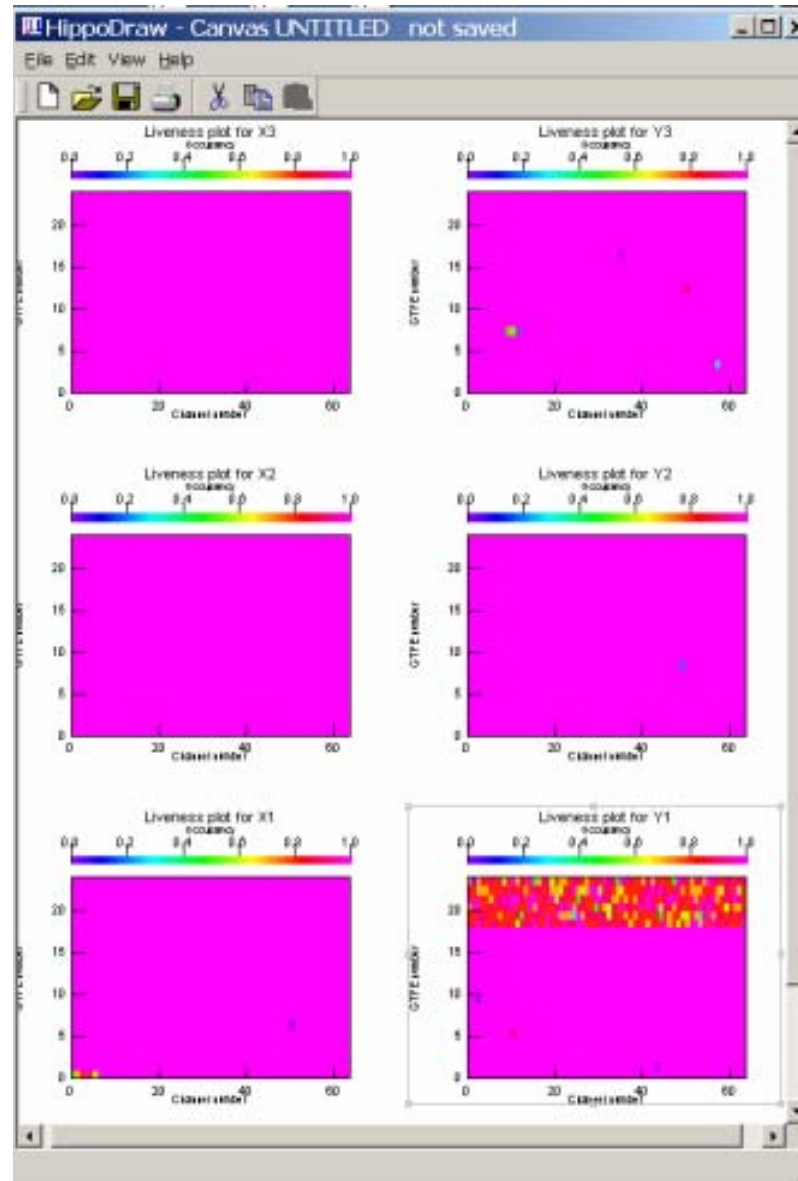




Mini-Tower Sept. 8

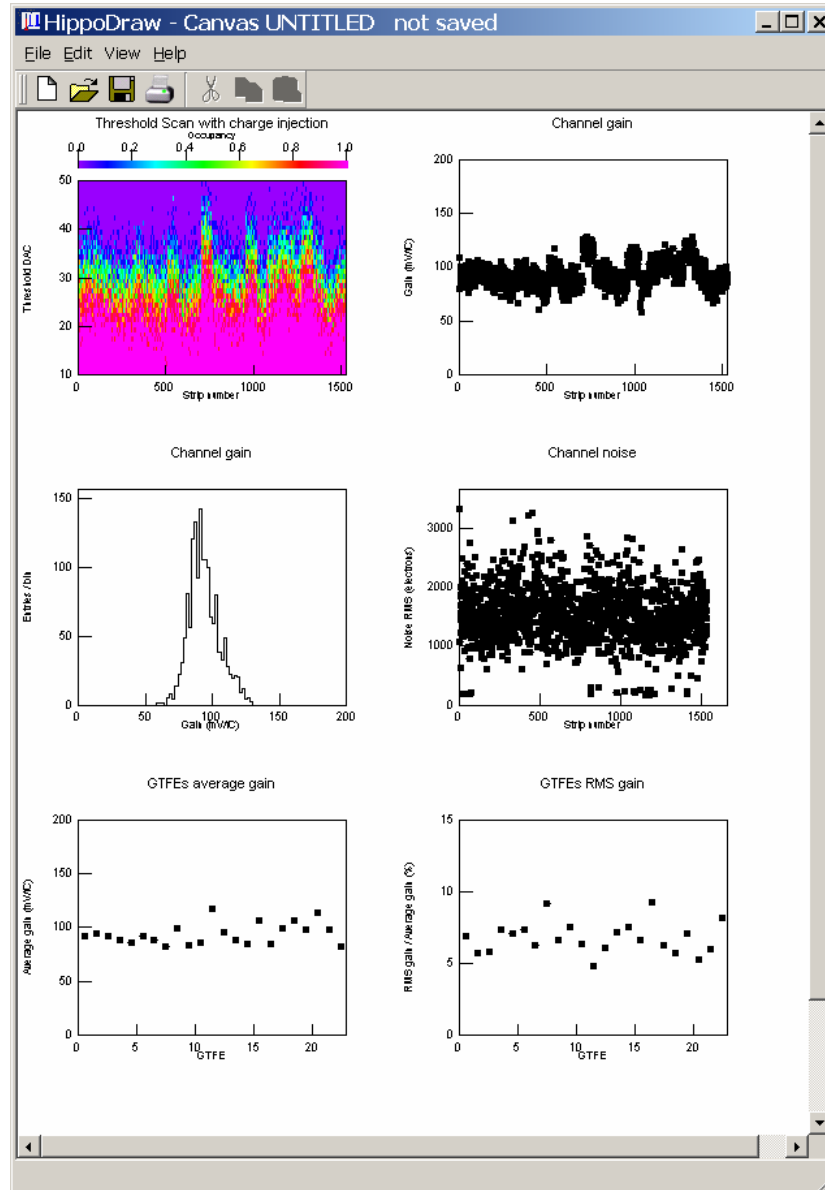
After 2nd De-Integration Operation

X2 - OK

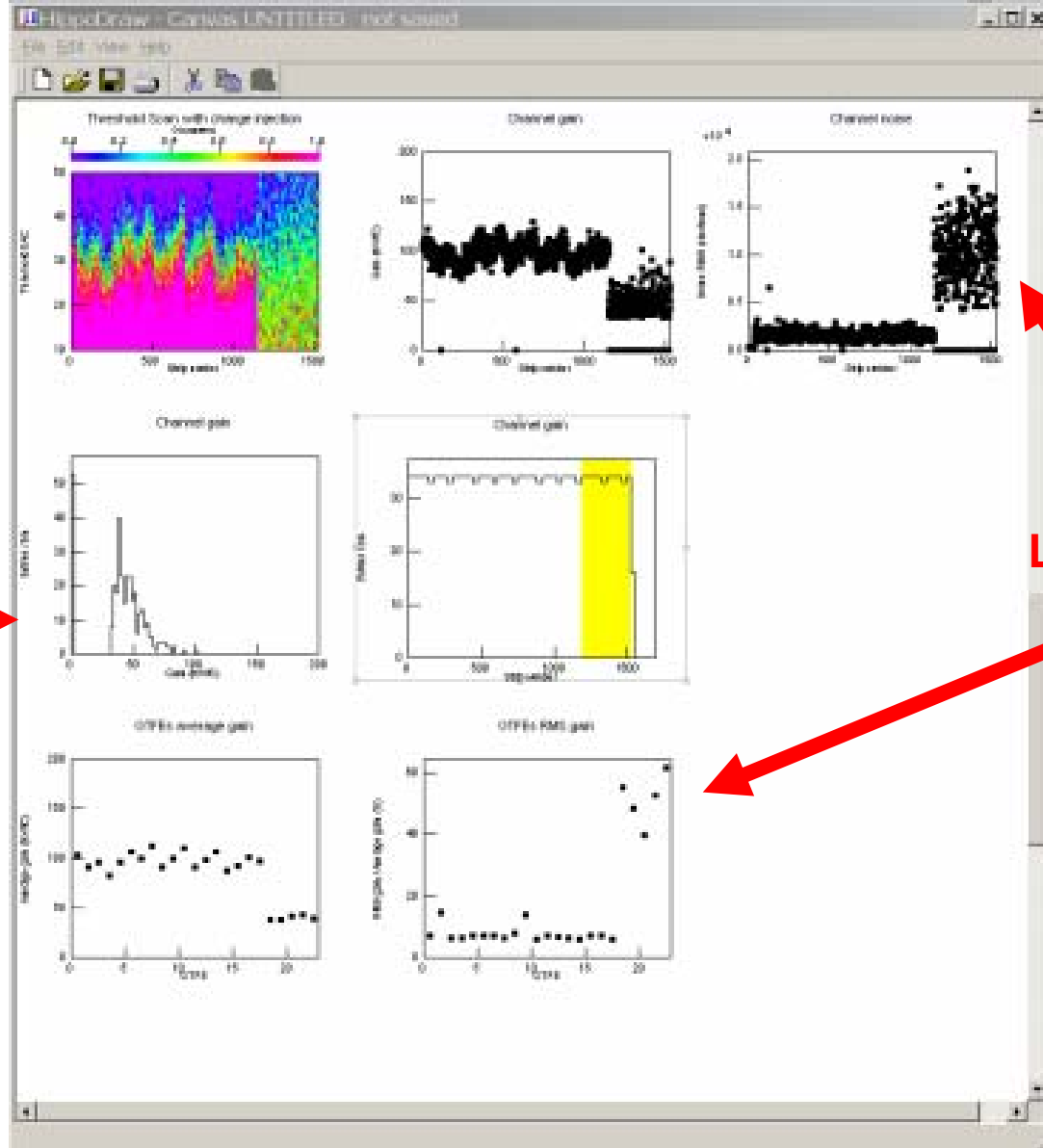
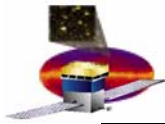


Y1 - FAILED

X2 – Noise and Gain



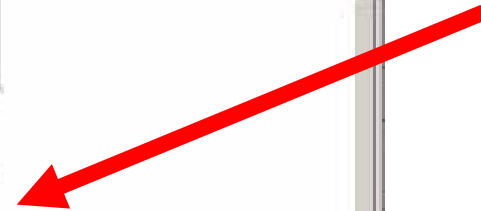
Y1- Noise and Gain



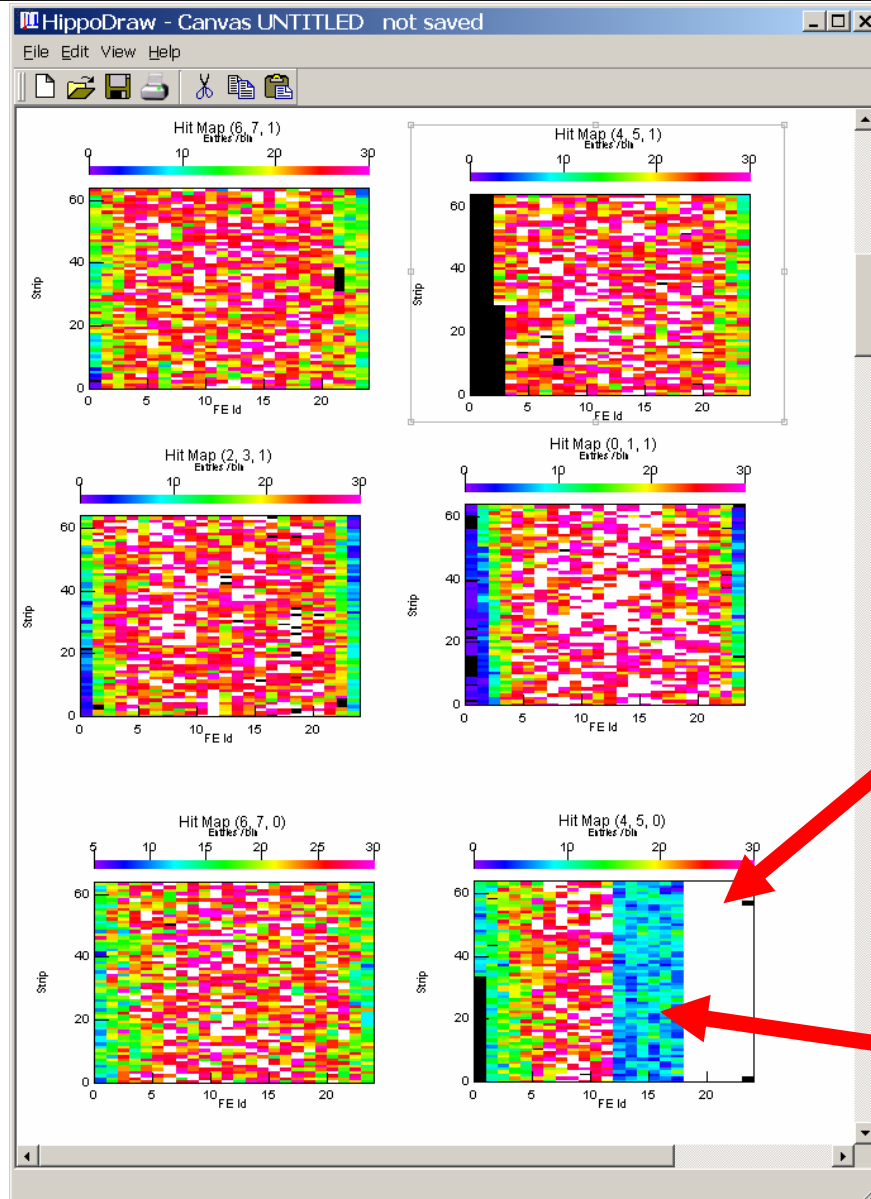
Ladder 4 –
Zero or low
gain



Ladder 4 - NOISY



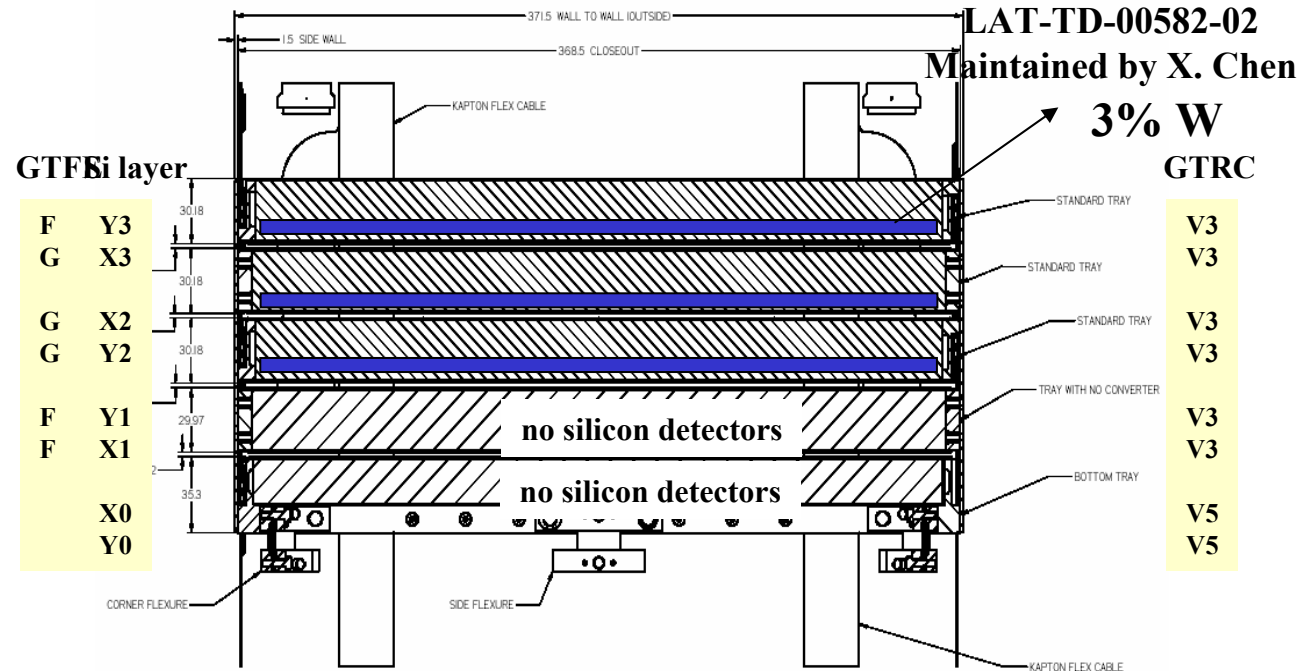
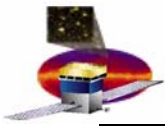
Mini-Tower Cosmics (6-layer trigger)



**Y1 Ladder 4
- 100 times
more hits**

**Y1 Ladder 3
- 50% fewer
hits**

Minitower Geometry



X2 is readout with flex cables C2, C3

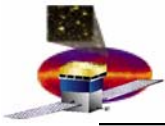
Y1 is readout with flex cables C4, C5

There are 8 layers instrumented with Front-End Electronics (MCMs) but only 6 layers instrumented with silicon detectors



EM Operations Integration and Facilities

- ✓ **EM CAL de-integration was performed prior to Sept. 8 de-integration; procedures were updated and signed-off by QA before Sept. 8 operation**
- ✓ **Mini-Tower de-integration was performed prior to Sept. 8 de-integration; procedures were updated and signed-off by QA before Sept. 8 operation**
- ✓ **Cleanroom has been in conformance with LAT contamination control plan during entire EM Operations**
- **I&T had good procedures, technicians trained beforehand, good facility conditions – unlikely cause of this problem**



Summary and Test Program

- **X2 ladders 3 & 4 problem has come and gone away again**
- **Y1 ladders 3 & 4 problem has appeared recently**

- ❑ **Need to establish review committee (right now!) specific to this problem**
- ❑ **Regularly Scheduled Mini-Tower Tests and review committee meetings – including liveness, cosmics, leakage current, etc..**
- ❑ **Software development program to allow quick generation of standard online graphs from online generated data files (not yet implemented!)**
- ❑ **Need deadline / schedule for test program to determine when/if this non-conformance is a considered a “show-stopper”**