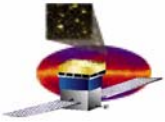**Gamma-ray Large Area Space Telescope**
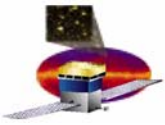
GLAST LAT System Engineering

LAT Test Planning Meeting - ACD Early Integration Testing

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Agenda

- ❑ **ACD Early Integration Testing**
  - – **Purpose**
  - – **Instrument Configuration**
  - – **Trigger Tests**
  - – **ACD Testing**
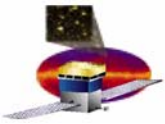 - – **TKR, CAL, and Dataflow Test Recommendations**

ACD Early Integration Testing - Overview

❑ **Purpose**

- – **Reduce risk of ACD Integration to the LAT**

- – **Take advantage of opportunity to test at a higher level of instrument integration while waiting for TKR Cables**

- – **Validate, to some extent, LAT Level Trigger and ACD test scripts and schemas**
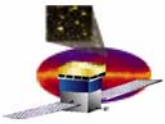
❑ **Test Configuration**

- – **Eight Towers in Grid**

- – **EM GASU and PDU**

- – **ACD Installed**

- – **LATTE 4.x**
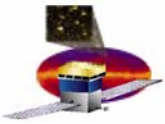
ACD Testing

❑ **ACD Functional Test**

– **Run prior to Trigger testing**

– **Functional test is the portion of the ACD CPT that is not performed at the margins, i.e. voltage and frequency are varied**

– **Tests include (TBD):**

- AcdInitCurrent, AcdPwr, AcdGarcRegRdWr, AcdGafeRegRdWr
- AcdGarcParityErr, AcdLeHeBiasCal, AcdHoldDelay, AcdHitmapDelay
- AcdVetoCal, AcdGafeNoise, AcdHldCal, AcdTciRegRange
- AcdPedestal, AcdHitmapTiming, AcdVetoHitmapPha
- AcdVetoAdcXtalk, AcdGasuHwdCtrsTci, AcdHvbsPmtAlive
- AcdTriggeredOp
- Full ACD Test on GASU Hardware Counters
- Light Tight Test
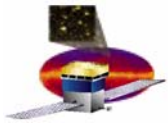- ACD Operations with LAT Trigger

Trigger Testing (1 of 2)

- ❑ **TREQ Time-In**
  - – **Performed on entire ACD in one test**
  - – **Utilize TKR Triggers as reference**
  - – **Use simple ROI Groupings for GEM and histogram VETO and CNO arrival times**
    - • VETO and CNO Thresholds set for muon
      - – Anticipate CNO rates will be low
  - – **GEM Tile list will be used to further correlate arrival times**
- ❑ **TACK Scan for AEM**
  - – **Scan through TACK Settings and histogram the results**
  - – **Histogram PHA data for each setting**
- ❑ **TACK Trigger Efficiency**
  - – **Trigger off the TKR**
  - – **Collect muons for ACD and all Towers together**
  - – **Measure Tile Trigger Efficiency by extrapolating off-line tracks and comparing to GEM Tile Hit List (PHA Hit map)**

Trigger Testing (2 of 2)

❑ **GEM ROI and TKR Test**

- **Verify timing of ACD Veto function**

- **Show Cosmics are successfully vetoed**
  - Expect a very low number of events from this test

- **Test methodology is TBD**

TKR, CAL, Dataflow Testing

❑ **To be provided**