GLAST Large Area Telescope

Instrument Science Operations Center
+WBS 4.1.D
Science Analysis Software

Monthly Status Review
1 December 2005

Rob Cameron
rac@slac.stanford.edu
650-926-2989
ISOC Management

- ISOC Operations Facility
  - GLAST/ISOC space requirements in Bld84: Central Lab Annex submitted to SLAC management
  - ISOC representation on office/lab space allocation committee (Cameron/Dubois)

- I&T coordination
  - Coordinating off-project support needs at NRL/SASS with I&T
    - Planning of workstations at SASS for realtime monitoring and data filtering + format translation
    - Telecon with MOC on “mini-MOC” capabilities at SASS

- Beam Test
  - Continued coordination of staffing and M&S needs for ISOC & beam test

- Other
  - Discussions with Japanese LAT collaboration representatives on Japanese presence at SLAC ISOC
  - Kickoff of Quicklook Working Group, to define quicklook science processing & data delivery requirements in ISOC
    - Initial detailed definition of QL requirements by end of 2005
  - Worked with Project Scientist to provide ITAR control matrix for review
CHS Activity

- **Housekeeping data issues**
  - Continued discussions with MOC about processing and sending LAT 96-analog data separate from Level 0
  - Proposed that ISOC accesses spacecraft data through MOC online Data Trending and Analysis System (DTAS) and online MOC-hosted ITOS pages

- **Initial meeting with Elizabeth Ferrara to identify scope of LAT operation procedure development**

- **Reviewed and updated CHS dataflow diagrams**

- **GOWG and GIMGOM meetings**
  - Discussed MOR preparations
  - Planning for next Operations TIM
    - At SASS: 18, 19 January 2006

- **Document Review**
  - Ops Data Product ICD CCRs
  - Baseline of Mission Operations Agreement (MOA) is in final review and signature cycle
  - Review of FSW Users Guide continues
CHS Testing

- **GRT3 status**
  - Final preparations in place
    - test procedures being finalized – includes (re)reviews by ISOC, weekly coordination telecons, lots of email
  - Pre-test mission planning data product exchange
    - received mission planning products from MOC & GSSC
    - verification that these match Ops Data Products ICD is I/P
    - generated LAT Science Timeline and sent to MOC & GSSC
    - to receive two more products before GRT3 (14 Dec)
    - any issues still pending with these on 14 Dec will be entered in GSFC issue-tracking database (SOARS) as GRT3 issues

- **Upcoming testing milestones**
  - 07 Dec: GRT3 Test Readiness Review
  - 13 Dec: dry run for GRT3
  - 14 Dec: GRT3 (official run-for-the-record)
  - July 06: next GRT (GRT5) moved from late-March 06 with one or more engineering tests before that
CHS: Software Development Activity

- **Software Releases**
  - Released version 1.2.0 of the ISOC software for pre-GRT3 acceptance testing
  - Performed acceptance testing
  - 7 tests used to verify:
    - ingest of 5 mission planning products from MOC & GSSC
    - ingest of L0 Science data files from MOC
    - handling overlaps in L0 data
  - All issues were reported in Jira, addressed, & passed retests
  - Test report in LATDocs – ‘LAT-TD-07700-01’
  - Released version 1.2.1 to close out test discrepancies
    - this code release to be used for GRT3

- **ISOC / FSW Integration**
  - Used FSW tools to create sample CCSDS-format physics event data for GRT3
    - 3 overlapping L0 datasets provided for GRT3 playback
    - ~2.5 GB total size

- **Operations Data Products handling**
  - Created sample LAT timeline package for GRT3
CHS: Software Development Activity (cont.)

- **Data Handling**
  - Began implementing run-boundary extraction software to support pipeline dispatch of science data

- **Trending**
  - Integrated Systems-Engineering-provided EU conversion & limits information into Trending database
  - Updated trending-data ingest software to work with the common I&T / ISOC T&C database interface

- **I&T Support**
  - Completed integration of FASTCopy data-transfer system onto two instances of mobile-rack hardware
  - Configured a data relay via SSH tunnels through the Cleanroom DMZ network

- **Other**
  - Reformatted and applied calibrations to LAT radiator thermal test data collected at Lockheed Martin, for analysis by LAT thermal engineers
LAT Configuration Database Activity

- Databases and Infrastructure TIM, 16 November
  - Look ahead to LAT System Test
  - Example considered: performing a LAT calibration
  - Near-term procedure
    - Use LATTE4-derived config files, plus conversion tools, to deliver configuration to LAT
  - Next: Enhanced FMX (FSW file management tool) functionality
    - “Callable” FMX derivative, for interaction with MOOT and LICOS
    - FMX-like support for operation from RAM (instead of EEPROM)
    - Portable FMX, for remote operation at NRL, SASS
Focused on DC2 prep with I&T stable
- Sim/recon ready for “final” background analysis
- 1000M background events generated; 20M “allGammas”
  - 10000 batch jobs run in SLAC pipeline; 10000 at Lyon
  - Reliability fixes made big difference!
  - 7000 CPU-hrs obtained in 36 hrs in SLAC runs
- First round of Instrument Response Functions determination started
- Setting up machinery for background interleave with DC2 signal
  - Determining rate dependence vs geomagnetic latitude
- Testing generation of DC2 skymodel in full sim/recon
  - Using ScienceTools Checkout 3 version
  - Was a good idea to try this early! Squishing some unexpected bugs…
SAS: November Activity (cont.)

- New LAT “Instrument” Data Server portal version released
  - Personalized history keeping, better input checking etc
- LAT Astro Data Server being optimized
- 20 Quad-CPU/4 GB RAM linux servers being added to SLAC batch farm in GLAST’s name
- 10 servers to replace our original 4 for web servers, Java application servers, mySql database servers (with mirroring) etc
- Let go SAS software developer; looking for replacement in-house now
- Pipeline web front end received more improvements
  - Can now produce plots from database on throughput; time latencies etc.
Background analysis finalized; first round IRFs ready.

Last few details to iron out: eg update of DC1 package to output Level 1 FITS file for photon list to SSC

Meeting with ISOC/PVOers to set desiresments for high level data diagnostics; how to leverage existing technology developed for software system tests and trending
  - Follow-up meeting next with developers to plot path to implementation
  - Attempt to include Quicklook and “Level 2” diagnostics

DataCatalogue integrated with DataServer

Astro Server ready for DC2

Pipeline II requirements/design agreed to

Core software meeting in January to examine the many external code upgrades needed (among other things).