GLAST LAT Project Weekly Report for the week ending Aug 16, 2001

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*** CALORIMETER (Carosso)

4.1.5.1 CAL Management

Preparation and participation in the Lehman Review and West Coast PDR's.
LAT cost review activity.
CAL costing review
Schedule update

4.1.5.5 Crystal Detector Elements

Continued PIN bonding tests, thermal cycling of optical adhesives. (NRL)

4.1.E.3 CAL Balloon Flight

Continuing analysis of pre-flight muon data to establish pre-launch gains. (NRL)

Began analysis of balloon flight data. For example, a first-pass analysis shows ~500 mostly-non-interacting He we can use for calibration. (NRL)

4.1.5.4.5 CAL Software/Design Verification

Released CalDigi design requirements document. (NRL)

Began work on digitization algorithm (CalDigiAlg) and electronic gain algorithm requirements documents. (NRL)

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*** BALLOON FLIGHT (Thompson)

On Saturday, August 4, the GLAST LAT Balloon Flight Engineering Model (BFEM) was launched just before local noon from the National Scientific Balloon Facility in Palestine, Texas (Flight #1579P). It reached float altitude of approximately 127,000 ft (38.7 km) two hours later and remained at that altitude for just over three hours until reaching the limit of telemetry range over San Angelo, Texas, where the flight was terminated.

All the detectors worked well throughout the flight. In particular, the three in a row trigger rate never exceeded 2 KHz, even in the Pfotzer (shower) maximum, where we had expected to reach the BFEM saturation rate of 6 KHz. At float, the trigger rate was 500 Hz, somewhat lower than simple calculations predicted.

The data volume collected is limited. A leak in the pressure vessel

appeared at about 15,000 feet, and the pressure leaked down to 2 psi before resealing (suspicion is that an O-ring failed to maintain its seal). The onboard disks were not designed to operate in a low pressure, so they were turned off when they began to generate errors, about an hour into the flight (but above the maximum trigger rate). The telemetry ran at 200 kbits/s throughout the flight. At float, this collected data at 14 Hz, or about 3% of the trigger rate.

Despite the limited statistics, the event data are quite adequate to demonstrate the performance of the BFEM. Real-time inspection and some off-line preliminary analysis show that many gamma ray pair events were seen, along with single tracks, showers, and some events with "strange" tracker patterns. The immediate goal of the data analysis will be to categorize the triggers, match the simulations to the trigger rate and distribution, and optimize cuts to select the gamma rays.

The BFEM has been returned to Goddard, where the tentative plan is to conduct some limited post-flight tests and then dis-assemble the instrument so that the subsystem hardware can be use for other testing.

The balloon flight has provided the only chance we will have before the satellite launch to see how a LAT-type instrument works in a near-space environment. The BFEM team strongly encourages anyone who is interested in LAT data analysis to review a sample of the triggers with an event display, as a guide to what the flight data will eventually look like.

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