Gamma-ray Large Area Space Telescope

DC2 Planning

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Data Challenge Planning Approach

- **Walk before running: design a progression of studies.**

  - **DC1. Modest goals.   Contained most essential features of a data challenge. Great success (lots of problems!)**

  - **DC2. More ambitious science goals. Encourage further development, based on lessons from DC1.**

  - **DC3. Support for flight science production.**

LAT Data Challenges: Updated Plan for DC2

DC2, based on lessons from DC1

– 1 simulated month of all-sky survey gammas (backgrounds: see next slide)

– key sky addition: <u>source variability</u>

  • AGN variability, including bright flares, quiescent periods

  • expand burst variety. <u>Include GBM.</u>

  • pulsars, including Gemingas, w/ orbit position effects.

– more realistic all-sky attitude profile

– background rate varies with orbit position

– more physics surprises

– update geometry (including s/c); add nominal hardware problems (and misalignments?); add deadtime effects and corrections

– Analysis Goals:

  • <u>produce toy 1-month catalog</u>

  • <u>try out transient releases and quicklook analyses, monitor sources</u>

  • point source sensitivity and localization studies

  • try first systematic pulsar searches (timing!)

  • diffuse analyses

  • recognize simple hardware problems (connect with ISOC)

  • benchmark processing times, data volume, data transfers.

Backgrounds in DC2

- **Reference numbers: per 1kHz of orbit average rate over one month amounts to 2.5B triggers, or O(10B) generated events. Nope.**

- **Let the science drive it!**
  - **the main need is presumably high-latitude diffuse spectral analysis**
  - **requirement is <10% of high-latitude diffuse in each energy decade.**
    - **In one day, this is $\sim 10^3$ residual events (so must generate $\sim 10^8$ events, which we can do). For single distributions without detailed features, *e.g.*, a simple spectrum plot, this could be sufficient statistics.**

- **<u>Proposal</u>: generate 1 (few?) day of background (~500M events)**
  - **include onboard filter and full background rejection analysis for all generated events (gammas+backgrounds)**
  - **Replay those few thousand residual background events randomly throughout the full one-month gamma set.**
  - **Most analyses should not notice. If it turns out to be very significant, we may have a few spiky distributions!**
  - **Think this through: will it work for the high-latitude diffuse analysis? Any other issues?**

DC2: When?

- **This is the year we build!**
  - **All of us must help as needed**
  - **SAS must support the integration and test. Try to minimize interference. Avoid conflicts with integration ramp-up and subsystem completion.**

- **Plan: be ready to release DC2 data July 2005**
  - **but stay flexible to minimize clashes with instrument testing**

- **Proposed duration: 2 full months.**
  - **DC1 lasted 2 months, but included the holidays**

From Lowell's Talk This Morning

GLAST LAT Project   **Collaboration Meeting, September 28, 2003**
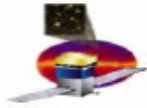
Key LAT events

- First tower modules ready for installation   November 2004
- Two towers installed and tested in the grid   January 2005
- Two tower Comprehensive Perf. Test Complete   February 2005
- Sixteen towers installed and tested   May 2005
- LAT completely assembled   June 2005
- LAT system test complete   August 2005
- LAT environmental test complete   December 2005
- GLAST observatory integration and test begins   January 2006
- Launch   February 2007

DC2 Coordinating Committee

- **Coordinates efforts across the team, ensures work is done on schedule. When necessary: triage! Does not set policy.**

  Ballet
  Burnett
  Cameron
  Connaughton
  Digel
  Dubois
  Longo
  Ritz
  Usher