

Discussion: To Where From Here?
DC1 Closeout Meeting
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Data Challenge Planning Approach

- **Walk before running: design a progression of studies.**
 - **DC1. Modest goals. Contains most essential features of a data challenge.**
 - **DC2. More ambitious science goals. Encourage further development, based on lessons from DC1.**
 - **DC3. Support for flight science production.**



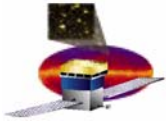
Original DC2 Concept

- **DC2 (preliminary!)**
 - **more sophisticated goals:**
 - 1 simulated month all-sky survey simulation (100M bkgd+gamma events post-filter. Method TBD) PLUS 1 simulated year of gammas
 - find AGN, bursts, pulsars
 - produce a toy 1-month catalog
 - detailed point source sensitivity and localization analyses
 - recognize more subtle hardware problems
 - a few more physics surprises
 - exercise:
 - exposure, data processing pipeline, analysis tools, quicklook. benchmark processing times, data volume, etc. connect to SSC.
 - use updated recon, bkgd rejection and instrument response to show the problem areas that need work. encourage improvements



Strawperson 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: source variability
 - AGN variability, including bright flares, quiescent periods
 - expand burst variety (and include GBM? see later slides)
 - pulsars, including Gemingas, w/ orbit position effects.
 - more realistic all-sky attitude profile
 - background rate varies with orbit position
 - more physics surprises, and add nominal hardware problems (and misalignments?), add deadtime effects and corrections
 - **Analysis Goals:**
 - produce toy 1-month catalog and transient releases
 - detailed point source sensitivity and localization studies
 - first systematic pulsar searches (timing!); detailed diffuse analyses
 - recognize simple hardware problems (connect with ISOC/SOG)
 - **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.
- Let the science drive it!
 - the main need is presumably high-latitude diffuse spectral analysis (except for earth albedo gammas, bkgd is ~sky-uniform? verify!)
 - requirement is <10% of high-latitude diffuse in each energy decade.
 - In one day, this is $\sim 10^3$ events (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.
- Proposal: generate 1 (few?) day of background (~ 500 M 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?