Introduction to the GRB Package

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Introduction

- The GRB package provides a generator of gamma-ray bursts, upstream of the GLEAM simulation tool.
- It allows the study of LAT response to a transient flux, with a fully consistent flow of time and change in spectrum and fluence.
- It is the main shared framework for development within the GRB science working group.

Motivations

- Provide GLEAM with a transient flux generator.
- Interface G4 so that LAT efficiency, etc…, can be studied.
- Provide a shared framework for physics studies.

Package Organization

- Package is divided into 3 main programs:
  - GRB physical simulator
  - GRB phenomenological simulator
  - Alert study tool (obsolete)
- The 2 simulators interface FluxSvc via inherited classes from ISpectrum:
  - Consistent flow of time and duration
  - Evaluation of the rate at time t
  - Random draw of next photon energy from the spectrum at a given time

Physical Simulator

- Located in "GRB" subdirectory
- Main classes:
  - GRBSpectrum, inheriting from ISpectrum
  - GRBsim, burst simulation manager
- Based on the internal shock fireball model
- See Nicola's talk

Phenomenological Simulator

- Located in "GRBmaker" directory
- Main classes:
  - GRBobsSpectrum, inheriting from Ispectrum
  - GRBmaker, burst simulation manager
- Based directly on an extrapolation of BATSE data
- See jay's talk

Alert Studies

- Located in LatGRBAlert.
- Obsolete, as new developments exist from jay/jerry in IDL.

Next Steps

- Include GRB package in GlastRelease
- Decide what to do with alert code
- Start adding/implementing analysis tools for physics studies: fit, visualization, etc…