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 LatGRBAAlert.
- 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…