

# GBM Burst Science Simulator

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★ **Goal: “Science Simulation” of GBM response to GRBs, solar flares, etc.**

- Use to study and optimize combined GBM/LAT burst trigger schemes
- Use to investigate and develop joint GBM/LAT burst analysis tools

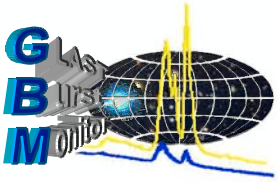
★ **Components**

- Detector response matrices (DRMs)
  - ★ Including instrumental effects (resolution, thresholds)
- Background (vs. energy [time])
- Flight software/hardware processing
  - ★ Burst trigger, intensity, location(s), timing of alert messages, etc.

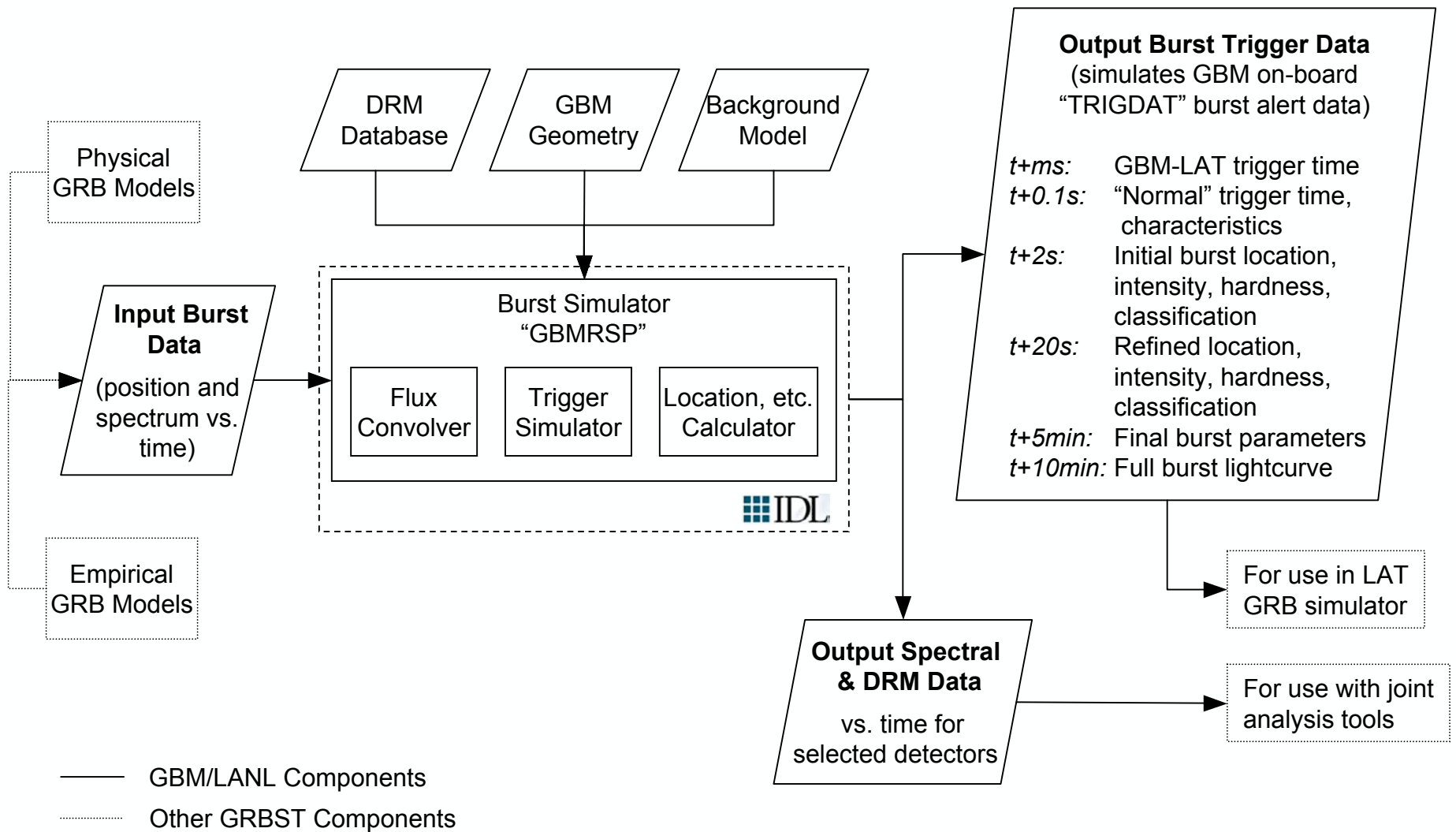
★ **Approach**

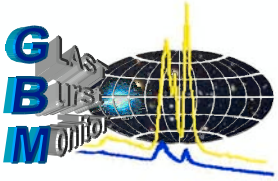
- Use prototype DRM database (generated with GEANT3)
  - ★ Baseline detector geometry (as proposed; 12 NaI, 2 BGO detectors)
  - ★ Direct response only (no spacecraft or atmospheric scattering included)
- Simple background model (based on BATSE data and simulations)
  - ★ Constant during burst
  - ★ Optional orbital variations between different bursts, and between detectors
- Simple treatment of on-board data processing
  - ★ “BATSE-like” trigger algorithm
  - ★ In-flight burst response operations based on flight software requirements

★ **Status: under test**



# GBM Burst Science Simulator Overview

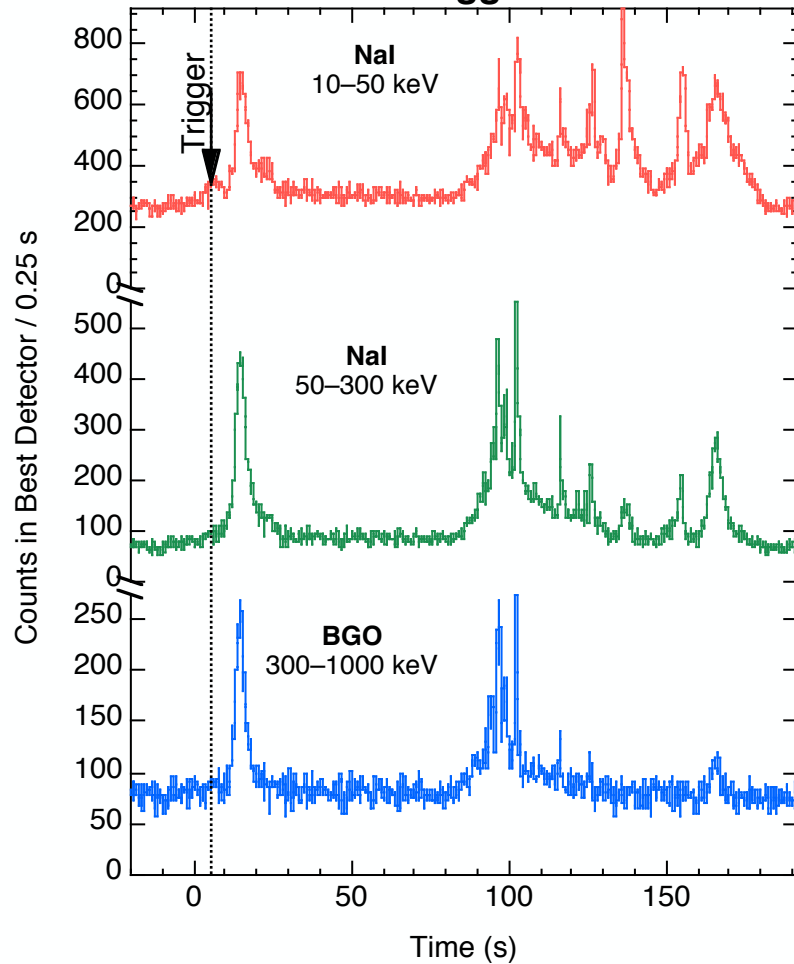




# GBM Burst Science Simulator Examples

Input: smoothly broken power-law model fits vs.  
time from Preece et al. (2000) BATSE catalog

**GBM Simulation of GRB 930201  
BATSE Trigger #2156**



**GBM Simulation of GRB 961029  
BATSE Trigger #5649**

