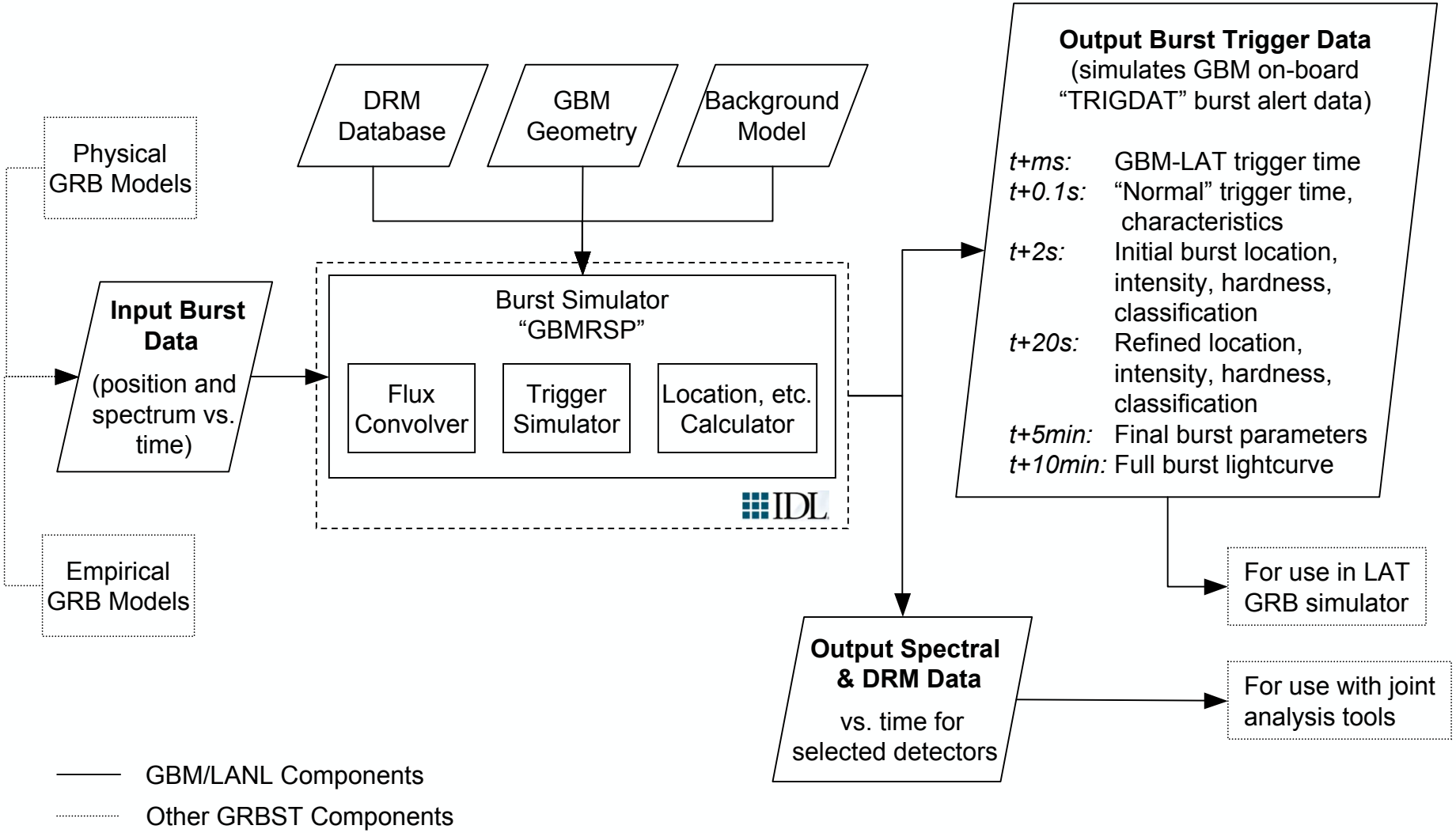
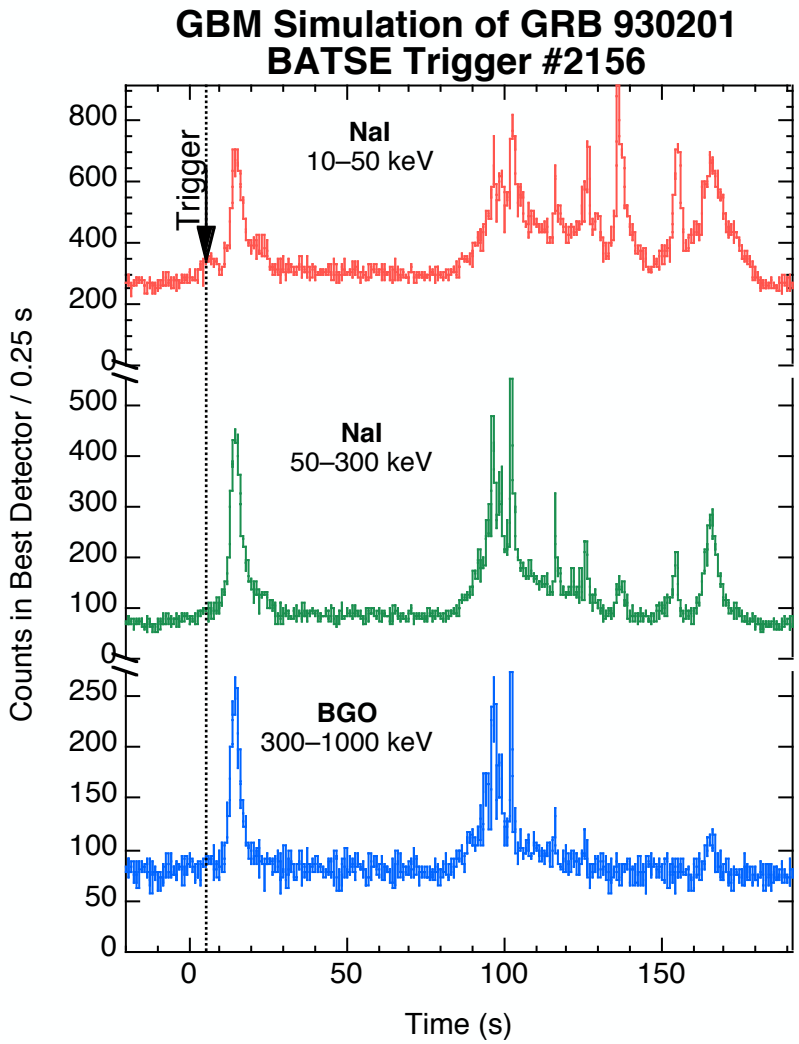
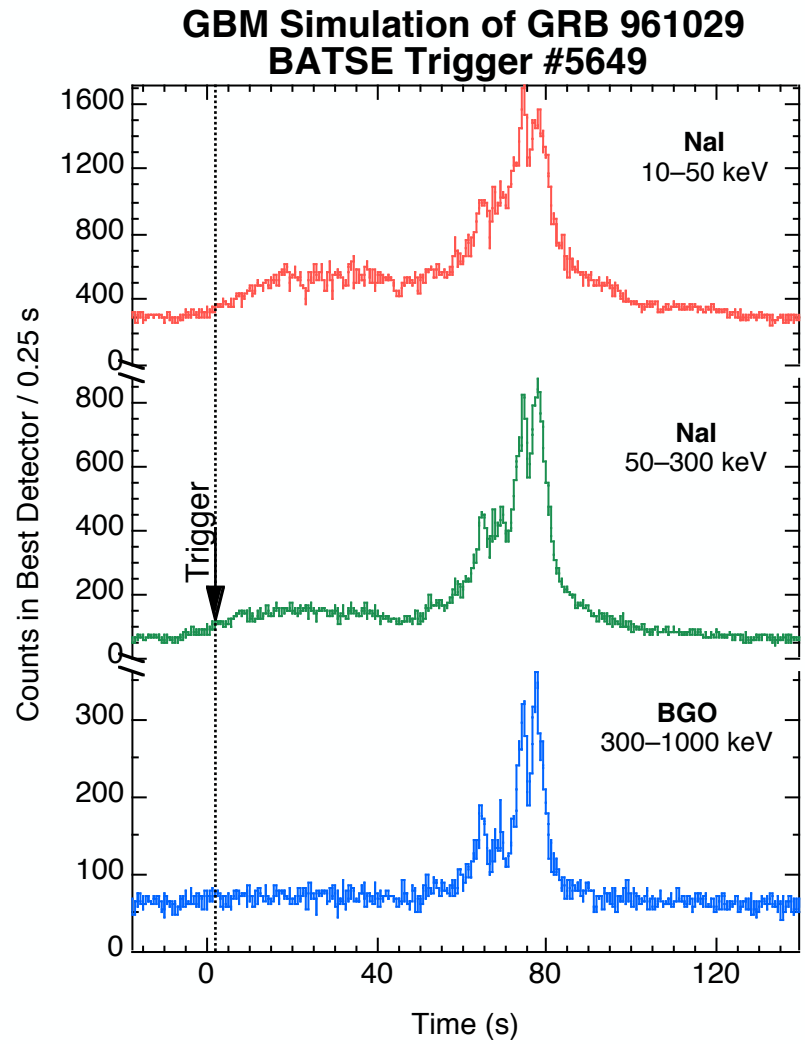
# GBM Burst Science Simulator

- **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