Finding untriggered gamma-ray transients in the Fermi GBM data
C. M. Hui, M. S. Briggs, P. Veres, R. Hamburg

• GCN notice type Fermi-GBM SubThreshold now available. https://gcn.gsfc.nasa.gov/fermi_gbm_subthreshold.html
• Time delay for notice range from 0.5 to 6 hours, due to telemetry schedule.
• List of candidates from older data (2013 and on) are available. http://gammaray.nsstc.nasa.gov/gbm/science/sgrb_search.html
• Available with the GCN notice:
  • Localization FITS file
  • Contour sky map
  • Lightcurve

GRB 170921C [Zhang et al. GCN 21919]
• Insight-HXMT 12σ detection coincident with Fermi-GBM subthreshold transient 527647422.
• T90 is 1.2s, energy range ~200-800 keV.
Fermi-GBM transient 527647422 info:
• High reliability candidate
• 3 detectors >4σ
• 2.8s long

Fermi-GBM 527647422 localization map

Fermi-GBM 527647422

Insight-HXMT lightcurve
• Looks for signals in 2 NaI detectors with 2.5σ and 1.25σ excess above background in the continuous time-tagged events (2μs resolution, 128 energy channels).
• The 2 signal detectors must have valid geometry for a point source.
• 18 timescales: 64ms to 31s.
• Only candidates <2.8s are reported at the moment.
• 4 energy ranges optimized for short GRBs.
  - 27—539 keV; 50—539 keV; 102—539 keV; 102—985 keV
• 1-day Poisson probability calculated for each event, threshold for short candidate notice is 1e-5.
• Expected rate of notice ~70/month, higher during active periods of galactic transients.

Swift GRB 140606A
• Fermi-GBM did not trigger due to low peak flux
• Found in 0.25s time binning
• 93 - 494 keV energy range

• Archival candidates starting 2013 are available: http://gammaray.nsstc.nasa.gov/gbm/science/sgrb_search.html

Galactic coordinates

- 318 short, hard candidates found in 46 months in previous study.
  - ~80 per year, twice the rate of GBM triggered short GRBs.

Fermi-GBM 423745096.56

INTEGRAL Anti-Coincidence Shield (ACS) lightcurve