https://ntrs.nasa.gov/search.jsp?R=20170010297 2019-05-01T04:23:35+00:00Z

Finding untriggered gamma-ray transients in the Fermi GBM data

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- 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 ground processing.
- 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

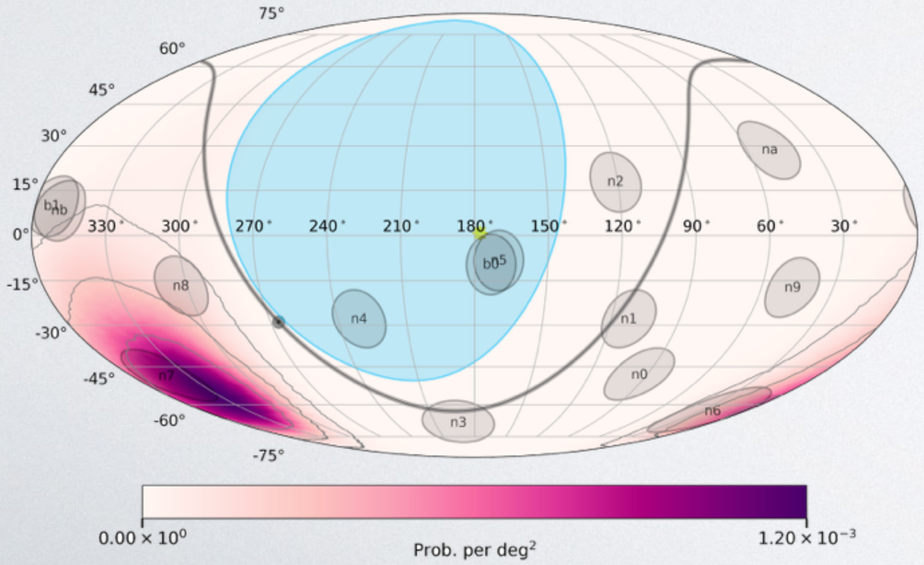
GRB 170921C [Zhang et al. GCN 21919]

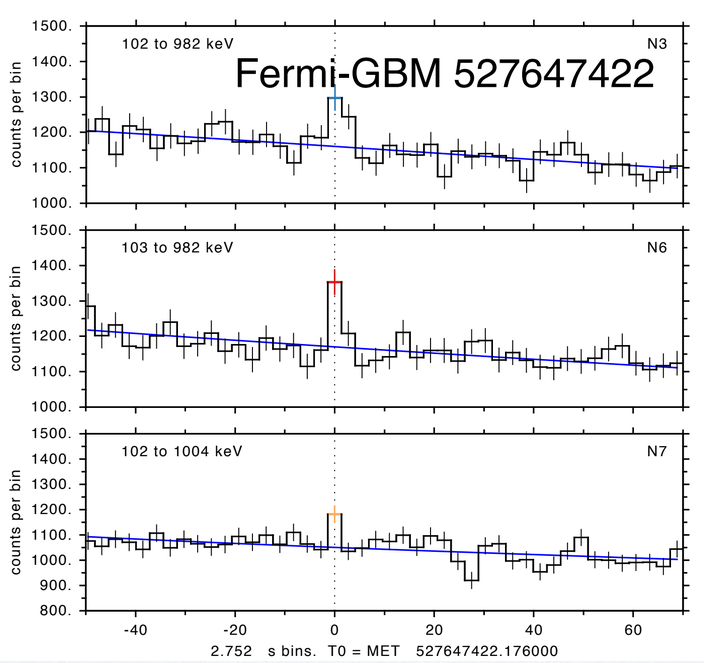
- Insight-HXMT 12σ detection coincident with Fermi-GBM subthreshold transient 527647422.
- T90 is 1.2s, energy range ~200-800 keV.

Fermi-GBM transient 527647422 info:

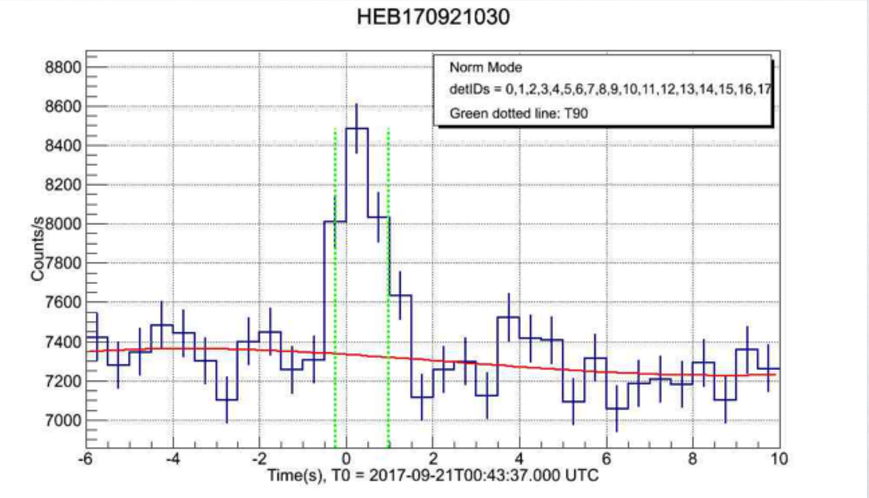
- High reliability candidate
- 3 detectors >4σ
- 2.8s long

Fermi-GBM 527647422 localization map

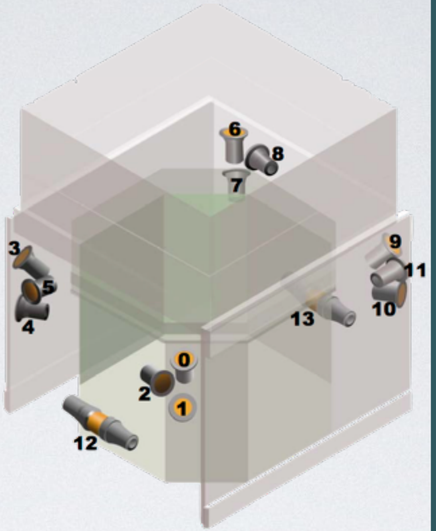


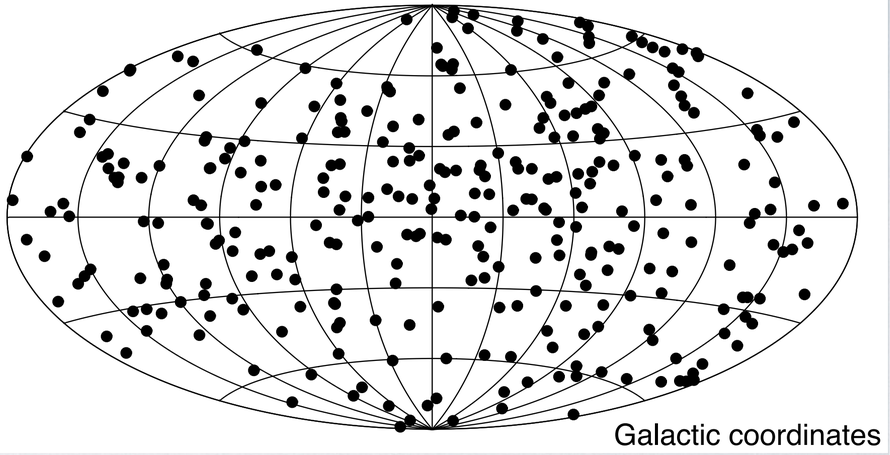


Insight-HXMT lightcurve



- 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.

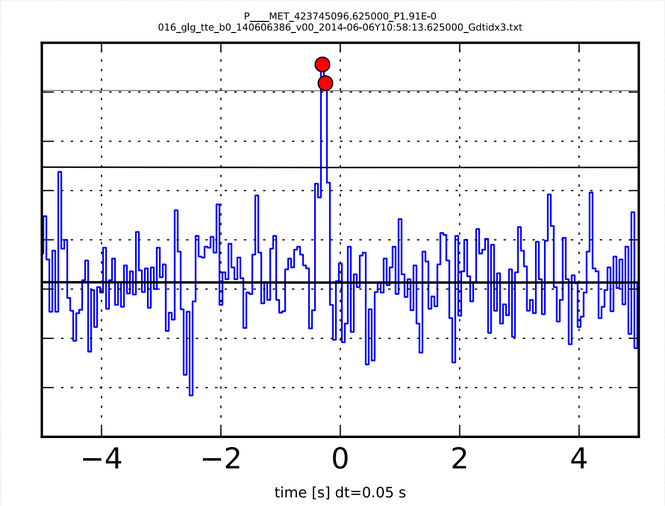
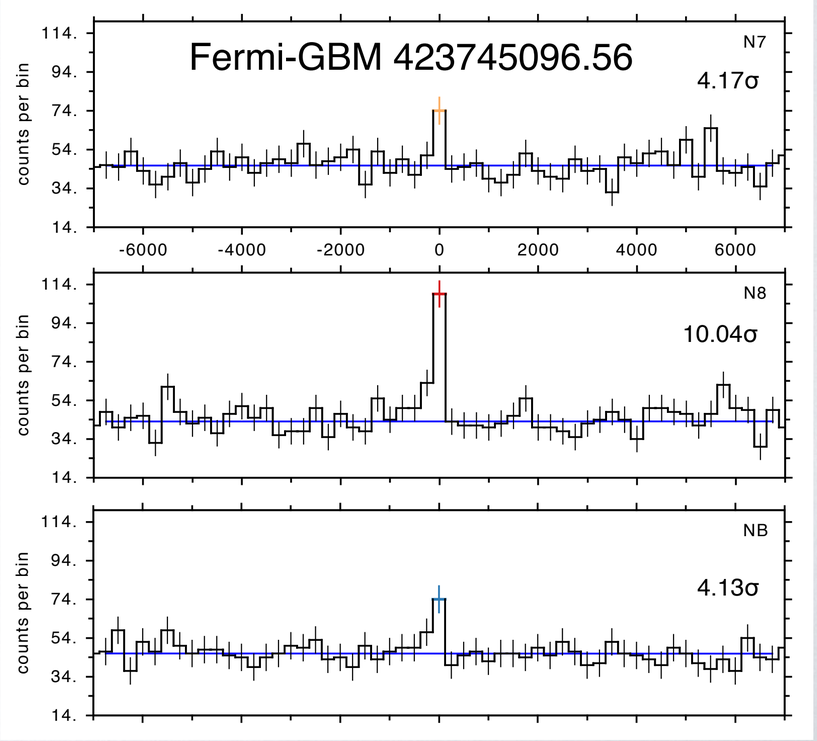




- 318 short, hard candidates found in 46 months.
  ➡~80 per year, twice the rate of GBM triggered short GRBs.

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

INTEGRAL Anti-Coincidence Shield (ACS) lightcurve