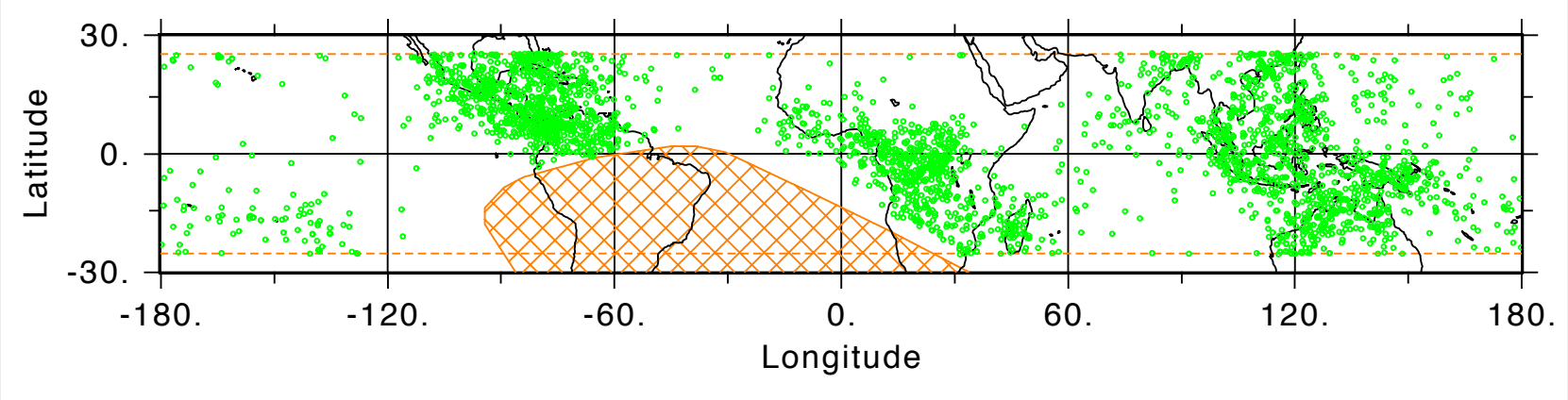
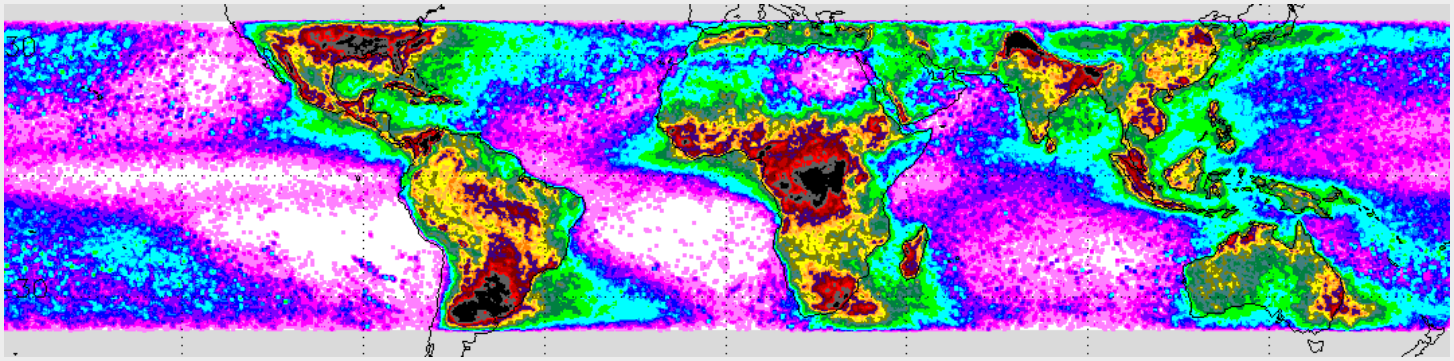
Terrestrial Gamma-ray Flashes: Bonus Science

Michael S. Briggs
University of Alabama in Huntsville

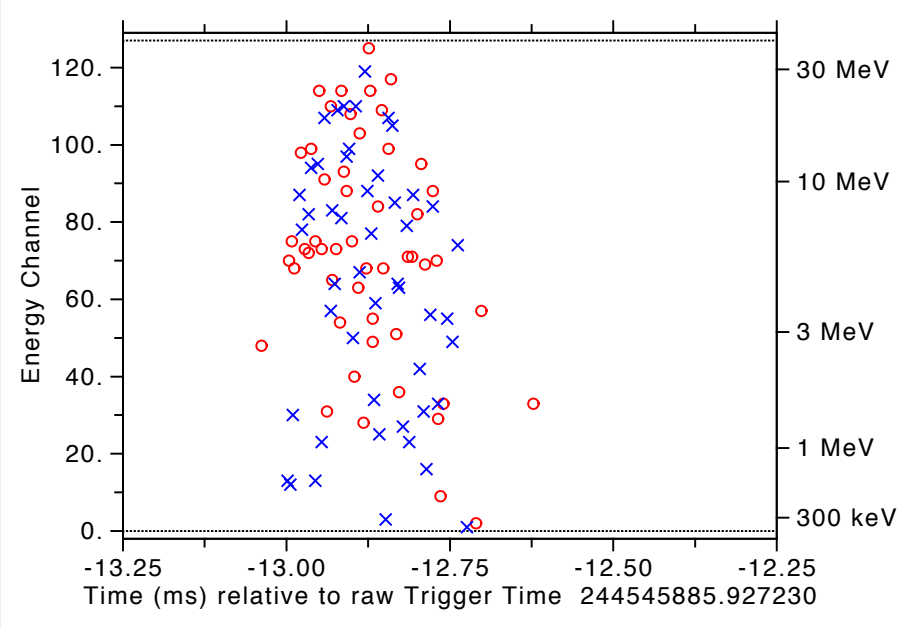
Fermi
Gamma-ray
Space Telescope

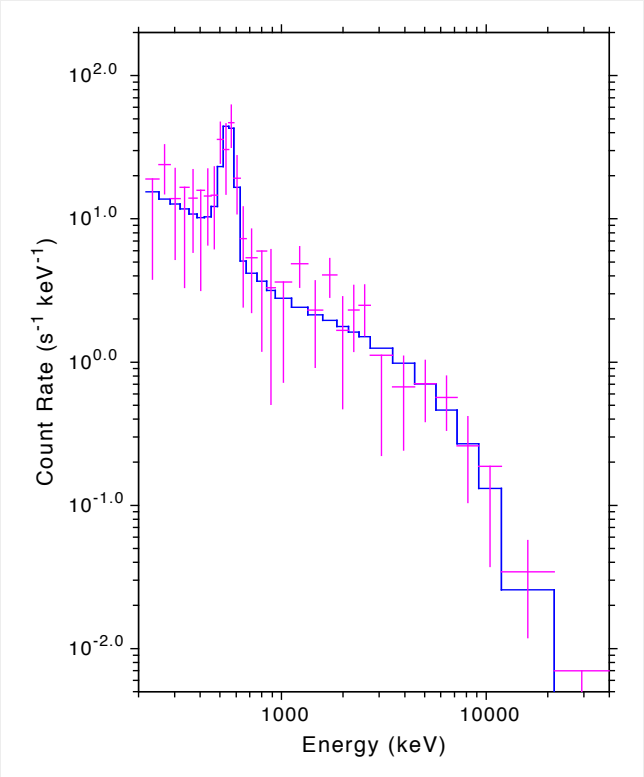
Fermi Locations at the times of 2700 GBM TGFs





Lightning Activity, as observed with the Lightning Imaging Sensor (LIS)

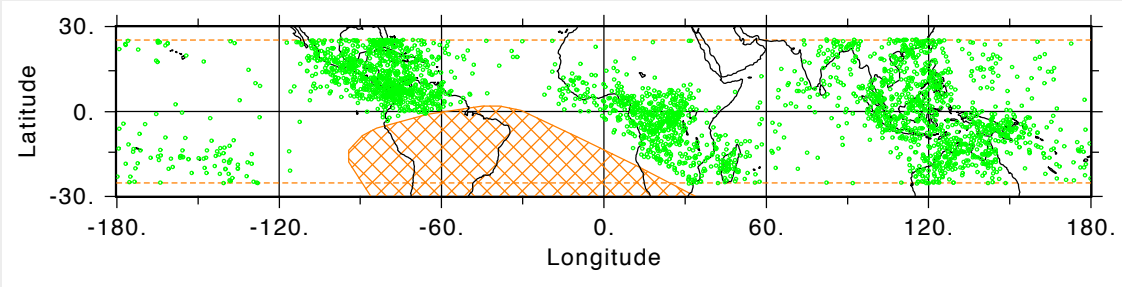


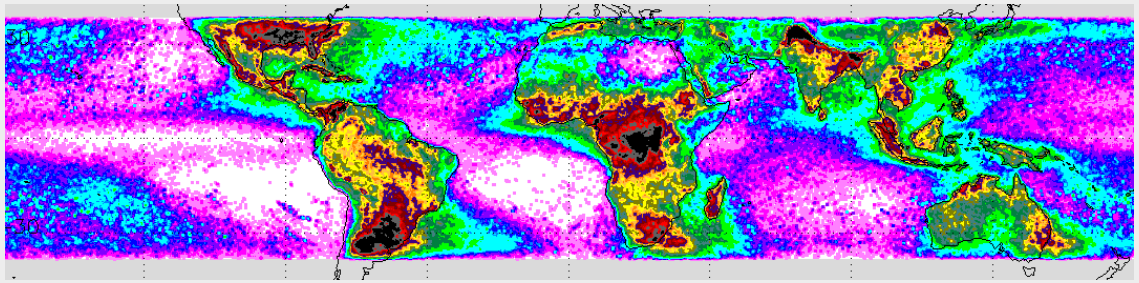


Fermi Gamma-ray Space Telescope

Future Space-based Gamma-ray Observatories

Fermi Locations at the times of 2700 GBM TGFs

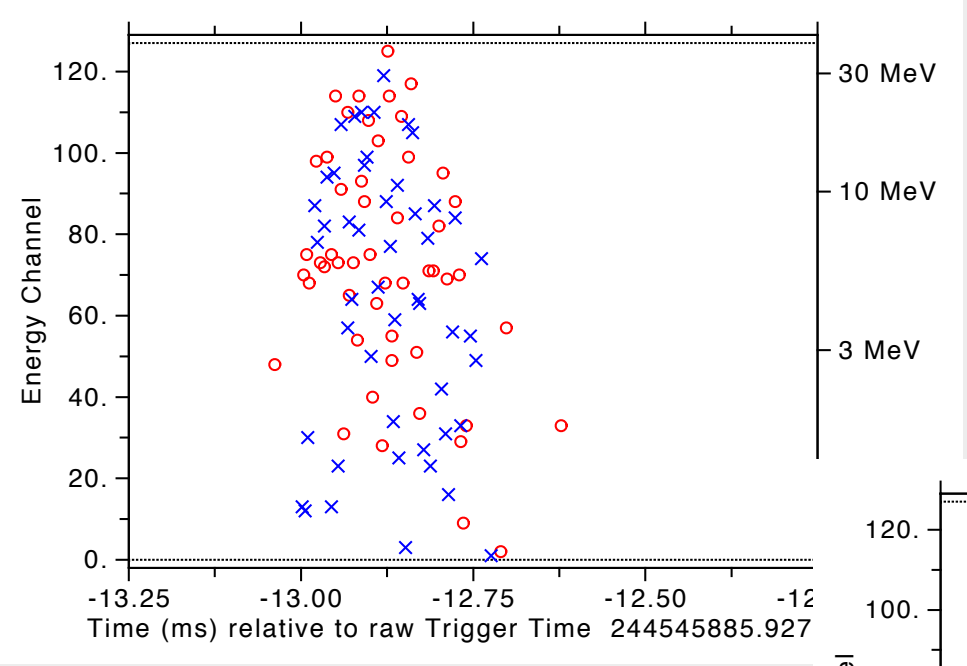


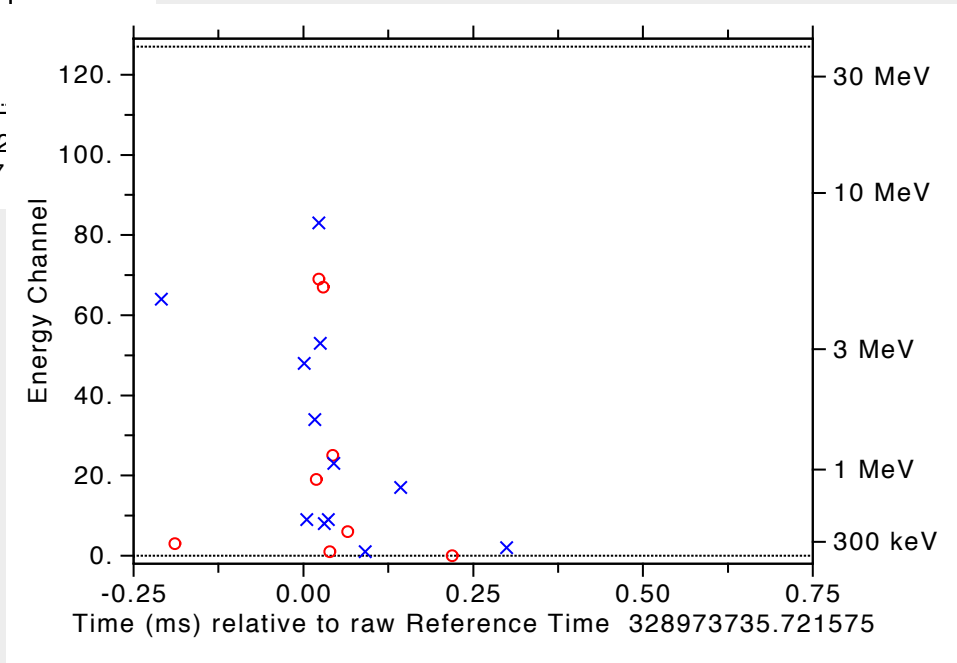


Lightning Activity, as observed with the Lightning Imaging Sensor (LIS)

GBM TGF : LIS lightning optical flash ratio: 1 : 2600

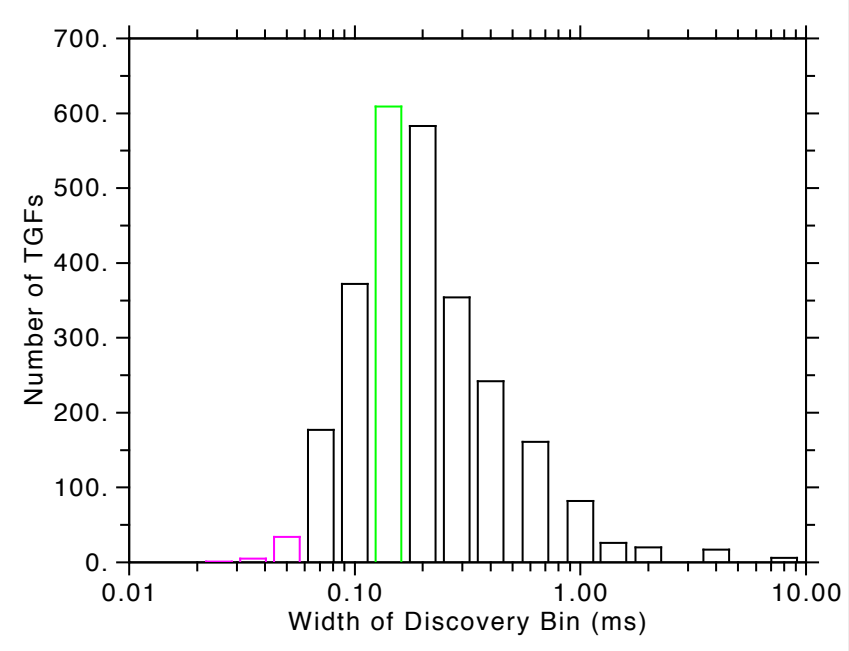
How many TGFs are there? What is the faintest TGF?

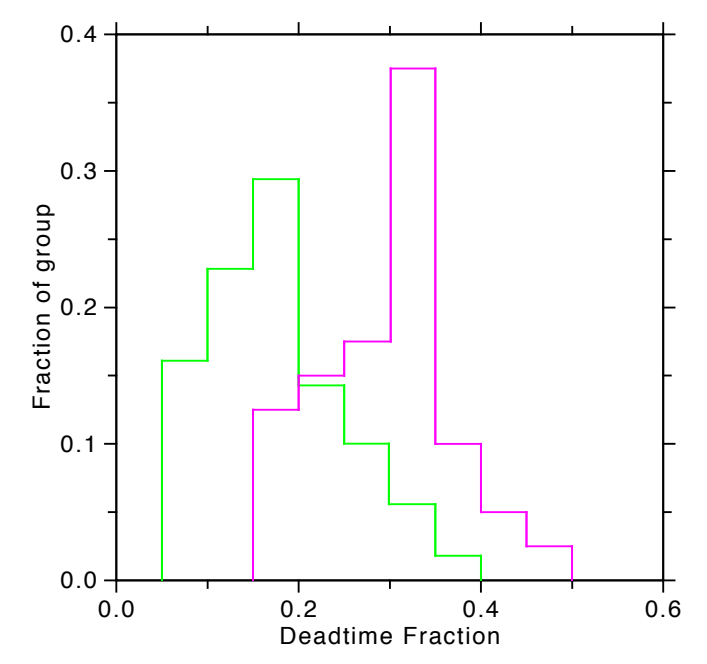




Fermi Gamma-ray Space Telescope

Future Space-based Gamma-ray Observatories





Currently high deadtime hinders the detection of short TGFs.

What is the shortest TGF? Are then many more short TGFs?

TGFs: there are fundamental questions that could be easily addressed as secondary science with a next generation gamma-ray mission, e.g., using “background” data from primary or shield detectors.

Requirements / potential issues:
Fast photon processing (low deadtime),
Telemetry volume,
TGF identification & discrimination against cosmic rays.