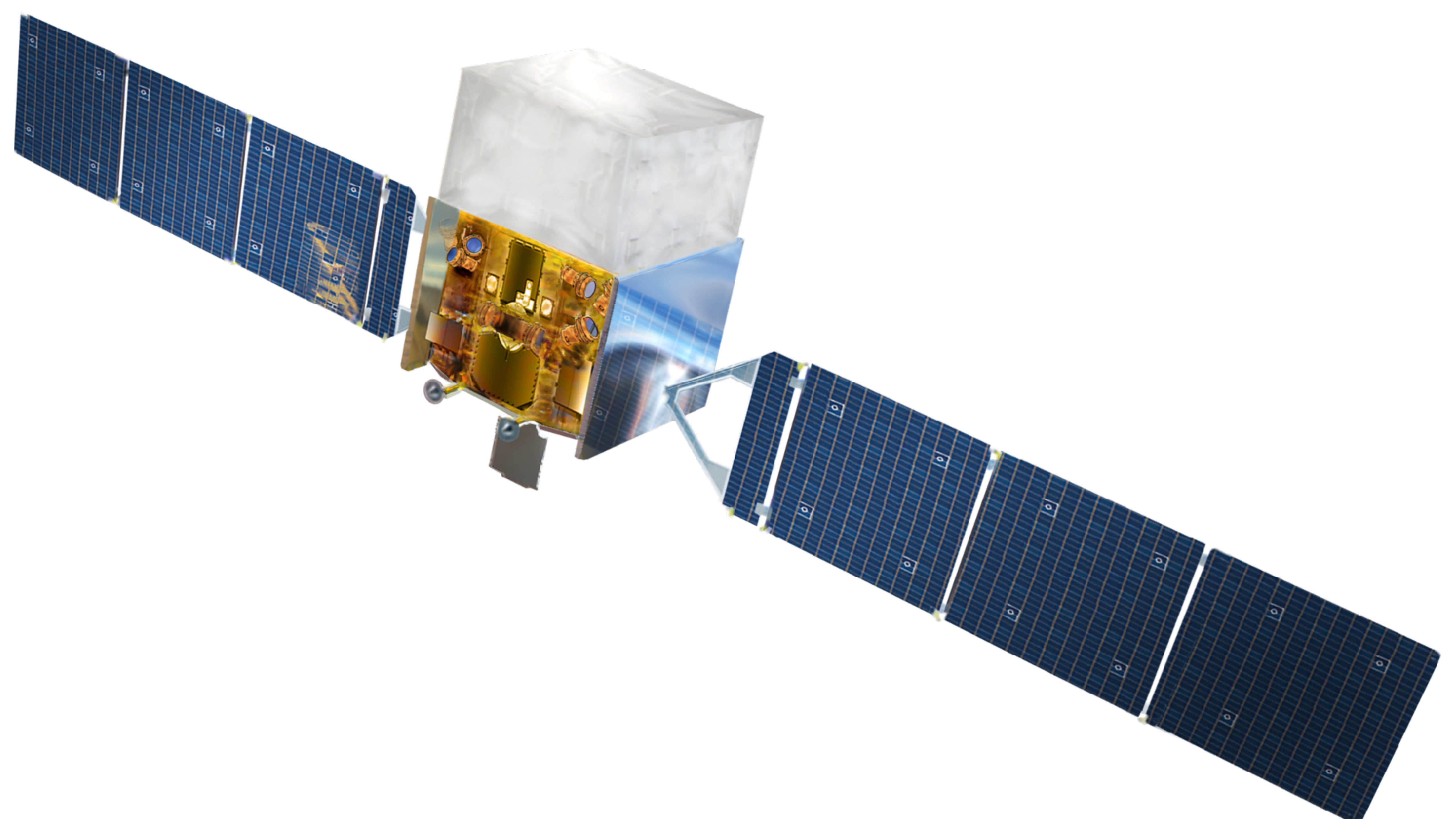


Fermi GBM Catalogs



- How often are GBM catalogs produced?
- What do they contain that is different from the real-time data?
- What sort of data release goes along with the catalogs? How is this different from the real time data?
- What sort of uptake do the catalogs have in the community? How has this changed over time?
- Do external groups produce competing catalogs? What impact do they have?
- How much of a burden is it for the team to produce the catalogs and support the user community?
- What would you do differently if you could do it all again? With unlimited resources??

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- The Fermi GBM trigger catalog at HEASARC contains basic information (trigger time, localization, classification, some info about spacecraft pointing, etc. for every GBM trigger.)
- Updated automatically from the TCAT FITS files sent to HEASARC for each GBM trigger.
- TCAT files are automatically produced, but can be manually reproduced (e.g., trigger is misidentified, better localization from another instrument, etc.)

- The Fermi GBM Burst Catalog contains the basic information from the trigger catalog above plus durations, fluences, and spectral fit information.
- The durations and fluences are in the BCAT files and the spectral fit information (using multiple models) are in SCAT files.
- The BCAT files are fits files routinely generated by burst advocates and then later replaced by a uniform catalog analysis for a GRB catalog paper.
- The SCAT FITS files are produced using a uniform analysis for the spectral catalog paper and replace any SCAT files produced by BAs.

- Cadence of the GRB catalog papers has increased over the course of the mission.
- Generally, two catalog papers are produced – the GRB catalog paper which includes the duration and fluence analysis for all GRBs and the spectral catalog paper which includes multiple spectral fits for GRBs bright enough to constrain the models.
- 1st GRB & Spectral catalog: 2 years
- 2nd GRB & Spectral catalog: 4 years
- Time resolved spectral catalog: 4 years
- 3rd GRB catalog: 6 years (no corresponding spectral catalog)
- 4th GRB & spectral catalog: 10 years

- Several additional catalogs have been produced by internal and external groups funded through the GI programs:
 - TGF catalog (~8 years)
 - X-ray burst catalog (3 years)
 - Magnetar burst catalog (5 years)
- Earth occultation catalog (3 years)
- Accreting pulsar compendium (10 years)

- Outside catalogs for GRBs are mostly funded by the GI program
- Some use outside analysis, e.g. IPN catalogs.
- Some groups produced their own pipelines and their own catalogs.
- There were some issues with external catalogs because they lacked in-depth knowledge of the instrument and analysis codes weren't similarly vetted.

- GBM catalogs are used in many ways by the community and the team
- Predict observations for future instruments (e.g., LEAP & MoonBEAM);
- Coincident event searches with LVK events
- Joint analysis with other instruments
- Statistical analyses
- Searches for particular types of events (precursors, GRBs like GRB 170817A, Magnetar Giant Flares, etc.)
- Testing GRB models.

- Producing the catalogs is burdensome on the team, but it is included in our core funding.
- Team members have been working toward more automated catalog data processing to make it less of a burden and to keep the analysis more uniform (replacing human-intensive processes with scripted tools).