Contribution ID: **23** Contribution code: **GAL**   Type: **Poster**

A Fermi-GBM Subthreshold Search Optimized for Magnetars

Monday 2 September 2024 09:00 (1 minute)

Magnetars are amongst the most extreme astrophysical sources in the universe. With their high densities and magnetic field strengths, they are an ideal test case for fundamental physical processes. However, with only 29 known magnetars, the mechanisms for their gamma-ray emission is not well understood. The Fermi Gamma-ray Burst Monitor (GBM) is an ideal instrument in detecting outbursts of gamma rays from magnetars. We took a previously developed search of Fermi-GBM's continuous data and optimized it to identify magnetar bursts below the GBM triggering threshold. In order to do this optimization, we studied the temporal and spectral properties of known magnetars to develop and implement new spectral model templates, optimal energy range, phases shifts and time windows for the search. Here, we present the results of the study and outline the updates to the GBM Targeted Search that have included for the optimization of this search for Magnetars.

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Session Classification: Poster hang