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Gamma Ray Burst localization with GECCO's BGO anticoincidence shields.

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The ability to observe transient events with good angular and energy resolutions is currently lacking in MeV gamma-ray astrophysics.

The Galactic Explorer with a Coded Aperture Mask Compton Telescope ("GECCO") will provide these capabilities thanks to the innovative use of a deployable coded aperture mask in combination with a Compton telescope mode.

For effective observation of transient sources it is necessary to promptly obtain the location of the sources to be repointed within the coded mask achievable field of view.

The spatial arrangement of GECCO's thick and efficient BGO anticoincidence shields can be used to quickly estimate the localization of transient events, allowing a prompt slew of the telescope.

GECCO is provided with 8 heavy-scintillator shields panels, arranged on the sides of an octagon. The ratios between the counts recorded by the panels depends on the direction of the signal with respect to the telescope axis. Simulations were conducted to assess the localization capabilities of the BGO shields, simulating the detection of GRB signals from the Fermi-GBM catalog with various spectral shapes and time profiles, in order to assess the evolution of their localization error radius with time.

The results show how the GECCO shields can achieve localization radii of a few degrees in a short time, allowing the telescope to be repointed in time to capture the transient signal.

Eligibility for "Best presentation for young researcher" prize

Yes

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