

Sixteenth Marcel Grossmann Meeting



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The VERITAS Gamma-Ray Burst Follow-up Program

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Recent detections of gamma-ray bursts (GRBs) at energies above 100 GeV demonstrate that imaging atmospheric Cherenkov telescopes (IACT) operating in the very high energy range (VHE; $E > 100$ GeV) can provide insight into the physics of GRBs. By searching for the highest-energy photons emitted by GRBs, these telescopes can help answer questions about the particle acceleration and emission processes that occur during both the prompt and afterglow phases of GRBs. VERITAS is a very-high-energy IACT array located at the Whipple Observatory in southern Arizona, which has maintained an active GRB observing program since mid-2006. In this presentation, we will share some of the recent achievements of the VERITAS GRB follow-up program. We will discuss the development of analysis methods tailored to transient signals, and how the upper limits on the VHE emission obtained from observations of prominent bursts by VERITAS allowed us to constrain radiation mechanisms in the afterglow (e.g., for GRB 130427A) and constrain properties of the environment in which the burst took place (e.g., for GRB 150323A). Compact binary mergers that trigger short GRBs may also result in gravitational wave emission, so we will review both our follow up program from LIGO/Virgo triggers, and also the use of archival VERITAS data to search for short GRBs based on sub-threshold events from LIGO/Virgo. Lastly, based on the properties of the VHE-detected GRBs, we will discuss recent changes to our follow-up strategy to account for the Swift/XRT properties for optimal VERITAS observing sensitivity.

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