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Search for Ultra-High-Energy Neutrinos from Gamma-Ray Bursts with the Pierre Auger Observatory

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The Pierre Auger Observatory has excellent sensitivity to ultra-high-energy (UHE) neutrinos. The Surface Detector array is used to search for highly inclined neutrino-induced air showers, which, though not observed yet, have clear characteristic signatures. Due to the null observation of UHE neutrinos, we obtain upper luminosity limits on individual gamma-ray bursts from the public catalog GRBweb, that are in the field of view of the Observatory for neutrino searches. As the predicted neutrino luminosity from these sources strongly depends on the modeled emission mechanisms and dissipative processes, we obtain the limits using different neutrino spectra corresponding to distinct scenarios such as the one-zone fireball model. The spectra are calculated using the source code “Cosmic Ray Stochastic Interactions for Propagation” (CRISP), to compute quantities related to the propagation of heavier primaries within the source environment.

Neutrino Properties

neutrino flux from LGRBs

Neutrino Telescopes & Multi-messenger

Investigating one of the possible extragalactic astrophysical UHE neutrino-emitting sources

Neutrino Theory & Cosmology

non

Data Science and Detector R&D

non

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