

UHECR from high- and low-luminosity GRBs

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We discuss the production of multiple messengers including UHECR, EM radiation and neutrinos in Gamma-Ray Bursts in models with multiple interaction regions.

We demonstrate that standard high-luminosity bursts can explain the UHECR spectrum as measured by the Pierre Auger Observatory, and derive the required source injection composition for different engine realisations. We discuss how multi-messenger observations can be used to discriminate between models by explicitly calculating the expected source and cosmogenic neutrino fluxes as well as the photon light curves. In addition, a separate population of LL-GRBs may exist, for which we show that different nuclei can indeed reach UHECR energies. For this purpose, we self-consistently model the radiation fields in prototypes inspired by real GRBs. We connect the maximal energies attainable for cosmic-ray nuclei to a possible VHE and HE component in the SED.

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other Collaboration

Subcategory

Theoretical Results

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