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Probing traces of intergalactic magnetic fields from gamma-ray bursts with very-high energy gamma-ray detectors

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The intergalactic magnetic field (IGMF) is the weak magnetic field present in the voids of large-scale structures in the Universe. The interdisciplinary studies on the IGMF link several research fields of cosmology, astrophysics and astroparticle physics.

Recently, gamma-ray observations in the GeV-TeV domain have been used to probe the possible presence and main properties of IGMF using different techniques. Gamma-Ray Bursts (GRBs) have been proposed as interesting targets for the detection of a secondary delayed pair echo emission, a signature of the presence of a non-zero IGMF. This delayed signal depends on the configuration of the IGMF and can be used to constrain its properties.

In this contribution, we present a phenomenological study of IGMF signatures from GRBs with TeV gamma-ray detectors. We predict the pair echo emission component generated by GRBs based on the intrinsic properties of GRB190114C and we determine the most convenient observational strategy for the current and future generation of gamma-ray instruments exploring different IGMF strengths, observational times and source intrinsic properties.

Submitted on behalf of a Collaboration?

No

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