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Probing the intergalactic magnetic field through gamma-ray ob- servations

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Magnetic fields in galaxies and galaxy clusters are believed to be the result of the amplification of seed fields during structure formation. However, the origin of this intergalactic magnetic field (IGMF) remains unknown. Observations of high-energy gamma rays from distant sources offer an in-direct probe of the IGMF. Gamma-rays interact with the extragalactic background light to produce electron-positron pairs, which can subsequently initiate electromagnetic cascades whose gamma-ray signature depends on the IGMF. The absence of the cascade signal has been used to place lower
bounds on the IGMF. In this overview, I will introduce the method of how to search for this cascade emission using spectral, spatial, and timing information of the signal, and review recent results and highlights. I will also discuss sources of uncertainties regarding predictions of the cascade and provide an outlook for the potential of future gamma-ray observations, in particular with the upcoming Cherenkov Telescope Array

Presenter: MEYER, Manuel