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## A robust lower bound on intergalactic magnetic fields from Fermi/LAT and MAGIC observations of 1ES 0229+200

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Secondary gamma-ray emission from distant TeV sources induced by the effects of propagation of gamma rays through the intergalactic medium could be used to probe the intergalactic magnetic field (IGMF). A proper realization of this opportunity requires a knowledge on the evolution of the source luminosity from GeV to TeV energies over the relevant period of time. Here we use a sample of MAGIC, H.E.S.S., VERITAS and Fermi/LAT observations to trace the evolution of the hard-spectrum blazar 1ES0229+200 in the GeV-TeV band over one-and-a-half decade in time. This allows us to make a precise prediction of the timing properties of the time-delayed secondary gamma-ray flux, removing the largest source of uncertainty for IGMF probing. We further show that the non-detection of such a secondary emission in the Fermi/LAT energy band yields a robust lower bound on the strength of IGMF.

### Collaboration name

MAGIC collaboration

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