

Intergalactic magnetic field constraints through gamma-ray observations of the extremely high-energy-peaked BL-Lac candidate HESS J1943+213

- The intrinsic emission of the source exceeds the TeV, with the second peak still far from being reached.
- TeV photons are reprocessed by the gamma-gamma scattering against the EBL in electron-positron pairs, which upscatter the CMB to GeV energies and give rise to a cascade component.
- Electron-positron pairs can be deflected off the line of sight by a strong ($>10^{-18}\text{G}$) Intergalactic magnetic field (IGMF), in which case the cascade component is suppressed.
- The generation, deflection and propagation of electromagnetic particles as well as the underlying IGMF structure is simulated with CRPropa 3.
- The cascade band is studied in 10 years of Fermi-LAT data with the last catalogue (4FGL).
- The intrinsic band is inferred from the observations of VERITAS and HESS and a Franceschini model of the EBL.
- The non-observation of the cascade component is then used to constrain the value of the IGMF to $6 \cdot 10^{-14}\text{G}$.