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Intergalactic magnetic field studies by means of the gamma-ray emission from GRB 190114C

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The origin of the large-scale magnetic fields in the Universe is one of the long-standing problem in cosmology. To discriminate among the different explanations it is crucial to measure the intergalactic magnetic field (IGMF) in the voids among the galaxies. Gamma-rays coming from extragalactic sources can be used to constrain the IGMF due to their interaction with the intergalactic medium. Particularly, strong transients allow to constrain very weak IGMFs. We use CRPropa3 to propagate the measured very-high energy ($E > 100$ GeV) spectrum from GRB 190114C in the intergalactic medium. We then compute the expected cascade emission in the GeV domain for different IGMF settings and compare it with the Fermi/LAT limits for different exposure times.

Collaboration name

Author: Dr DA VELA, Paolo (University of Innsbruck)

Co-authors: MARTÍ-DEVESA, Guillem (University of Innsbruck); STAMERRA, Antonio (INAF-OATo / SNS-Pisa); LONGO, Francesco; VERES, Peter (University of Alabama in Huntsville); Dr SATURNI, Francesco (INAF Osservatorio astronomico di Roma)

Presenter: Dr DA VELA, Paolo (University of Innsbruck)

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