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Dark photon constraints using the UHE gamma-ray emission from galactic sources

Dark photons (Dph) are cold dark matter candidates and bosons of a U(1)-like interaction to a hidden sector additional to the Standard Model (SM). For SM photons propagating in the Universe, a kinetic mixing with Dph can occur, allowing to perform indirect searches using the observed spectrum of galactic and extragalactic sources. To carry out the search, we use a model independent approach to compare the observations to a scenario including the photon-Dph conversions, and looking out for anomalies in the spectrum. In this work we use the HAWC and LHAASO reported TeV spectra for two galactic sources to search for possible effects associated with the existence of Dph. We do not find evidence of the photon-Dph conversions, then we establish bounds on the dark photon parameters space with mixing angle χ between 0.01 and 1.00 and mass μ between 10^{-8}eV and 10^{-5}eV .

Collaboration(s)

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