

Fundamental physics in the cosmos: The early, the large and the dark Universe



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Search for Secluded Dark Matter with H.E.S.S. and Fermi-LAT Telescopes

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Secluded dark matter models feature dark matter annihilations into a metastable mediator which then decays into Standard Model fermions. In this work, we test these models using current data from the Fermi-LAT (6-year observation of dwarf spheroidal galaxies) and the H.E.S.S. (10-year observation of the Galactic center) instrument. Assuming that the metastable mediator shortly decays into charged leptons we derive constraints on the annihilation cross section $\langle\sigma v\rangle$ vs dark matter mass. In particular, for decays into taus, we exclude $\sigma v \sim 4 \times 10^{-27} \text{cm}^3/\text{s}$ for dark matter mass of 10-GeV using Fermi-LAT, and $\sigma v \sim 3 \times 10^{-25} \text{cm}^3/\text{s}$ for 1TeV dark matter mass with H.E.S.S.. Our findings supersede previous constraints using Fermi-LAT data and constitute the first time limits on secluded dark sectors using H.E.S.S. telescope.

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