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Linking the LHC and astrophysics with anomalies

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Emerging anomalies in both di and multi-lepton data from the LHC have been used to motivate for an extension to the Standard Model in the form of a second Higgs doublet and a singlet scalar (2HDM+S). Here we explore a dark matter candidate drawn from this model: a scalar particle that couples to the Standard Model through the 2HDM+S degrees of freedom. Using the best-fit 2HDM+S model from LHC data, and consequent dark matter annihilation/decay yields, we explore whether this model can account for the galactic-centre Fermi-LAT and anti-particle excesses. Additionally, we will study the general constraining power of gamma-ray data on this model. This study is part of a project exploring potential connections between collider and astrophysical excesses, thus seeking to illustrate new synergies between large and small-scale probes beyond the Standard Model.

Abstract field

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