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Connecting astrophysics and the LHC with anomalies

Wednesday 12 October 2022 14:30 (15 minutes)

Anomalies in multi-lepton data from the Large Hadron Collider (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 will study the general constraining power of Fermi-LAT data on this model. In particular, we will see if Fermi-LAT data impacts the parameter space used to explain various astrophysical excesses in previous work. 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 as well as those between the MeerKAT/SKA and high-energy astrophysics experiments.

Track

Dark Matter

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