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Current constraints on the Doublet-Triplet fermion dark matter model

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We present a simplified dark matter (DM) model that arises from the interplay of a Majorana triplet and a vector-like doublet, both odd under a Z_2 symmetry that stabilizes the DM. The region where DM mass lies at the electroweak scale is severely constrained from relic abundance and Higgs diphoton decay. For this reason, we study the model within the framework of non-standard cosmology, where relic may be set by more intricate processes than just the WIMP freeze-out. We then use the latest experimental results coming from XENON1T, electroweak production at colliders, Higgs diphoton decay, indirect detection from gamma-rays both in the diffuse and line-like spectrum to constrain the model. As a result, we find that though large portions of the parameter space are ruled out, there are still viable regions, most of them will be explored in coming years by direct detection and diffuse gamma-rays spectrum.

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