

## Majorana Dark Matter and Neutrino mass in a singlet-doublet extension of the Standard Model

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A minimal extension of the Standard Model (SM) by a vector-like fermion doublet and three right handed (RH) singlet neutrinos is proposed in order to explain dark matter and tiny neutrino mass simultaneously. The DM arises as a mixture of the neutral component of the fermion doublet and one of the RH neutrinos, both assumed to be odd under an imposed  $\mathcal{Z}_2$  symmetry. Being Majorana in nature, the DM escapes from  $Z$ -mediated direct search constraints to mark a significant difference from singlet-doublet Dirac DM. The other two  $\mathcal{Z}_2$  even heavy RH neutrinos give rise masses and mixing of light neutrinos via Type-I Seesaw mechanism. The particle content automatically allows us to extend the model by an anomaly free gauged  $U(1)_{B-L}$  symmetry, which brings an additional portal between DM and SM particles. Relic density and direct search allowed parameter space for both the cases are investigated through detailed numerical scan, while collider search strategies are also indicated.

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