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Leptogenesis assisted by triplet Fermion in connection to Muon $g - 2$.

We propose extending the minimal scotogenic model with a triplet fermion and a singlet scalar. All the fields change non-trivially under an additional $Z_4 \times Z_2$ symmetry. The $Z_4 \times Z_2$ symmetry allows only diagonal Yukawa couplings among different generations of SM leptons and right-handed singlet neutrinos. The one-loop radiative diagrams generate neutrino mass. The Yukawa coupling of the triplet fermion with the inert doublet positively contributes to the muon anomalous magnetic moment. The imposed $Z_4 \times Z_2$ symmetry forbids the conventional leptogenesis from the lightest right-handed neutrino decay N_1 . The decay of triplet fermion and right-handed neutrino N_2 can generate a net lepton asymmetry in the muonic sector. Involvement of the Yukawa coupling both in leptogenesis and in the anomalous magnetic moment of the muon results in a strong correlation between leptogenesis and the recent Fermi lab result. We show a viable parameter space for leptogenesis while explaining the Fermi lab results. The inert scalar is the dark matter candidate in this model.

Field of contribution

Phenomenology

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