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Triplet Scalar Dark Matter and Leptogenesis in an Inverse See-Saw Model of Neutrino Mass Generation

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We propose a UV-completion of the inverse see-saw scenario using fermion SU(2)L triplet representations. Within this framework, a variation of the standard thermal leptogenesis is achievable at the O(TeV) scale, owing to the presence of a viable Dark Matter candidate. This baryogenesis scenario is ruled out if a triplet fermion is observed at the LHC. The Dark Matter is given by the lightest neutral component of a complex scalar SU(2)L triplet, with mass mDM > 1290 GeV. The scalar sector, which is enriched in order to account for the small neutrino masses, is treated in detail and shows potentially sizable Higgs boson h $\longrightarrow \gamma\gamma$ rates together with large h invisible branching ratios.

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