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Neutrino mass from d>5 effective operators in an SU(5) GUT with discrete symmetry

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New physics models often come with an extended Higgs sector and additional (discrete) symmetries. We will show that in these models neutrino mass can be generated by higher-dimensional effective operators, which can be systematically studied. As a consequence new physics will appear at the TeV scale, which has phenomenological implications at the LHC, such as processes with displaced vertices and lepton number violation. We will further discuss how these models can be embedded into SU(5) GUT models with discrete symmetries. Additional heavy d-like quarks that appear in the SU(5) multiplets will be studied with regard to cosmological constraints.

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