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Three-loop neutrino masses via new massive gauge bosons from E_6 GUT

We propose a $SU(3)_C \times SU(2)_L \times SU(2)_N \times U(1)_Y$ model arising from E_6 grand unified theory. We show that the tiny neutrino masses in this model can be generated at the three-loop involving the $SU(2)_N$ gauge bosons. With Yukawa couplings around 0.01 or larger and TeV-scale $SU(2)_N$ gauge bosons, we show that the neutrino oscillation data can be explained naturally by presenting a concrete benchmark set of input parameters. All new particles are around the TeV scale. Thus our model can be tested at the ongoing/future collider experiments. This model also has the potential to solve the anomalous magnetic moments of both muon and electron..

Mini-abstract

A testable TeV-scale three-loop neutrino mass model.

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