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Doubly-charged scalars at high-energy and high-precision experiments

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Some well-motivated neutrino mass models predict the existence of leptophilic doubly-charged scalars. Their Yukawa couplings can be constrained by low-energy lepton flavor violation and neutrinoless double beta decay searches, as well as by multi-lepton searches at colliders. However, there is still a large chunk of unexplored parameter space, which could be effectively probed by the displaced vertex searches at the LHC and future colliders, as well as the high-precision low-energy experiments like Moller. We show that there exists a novel complementarity between these high-energy and high-precision experiments in probing the origin of neutrino mass.

Summary

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