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Searching for Majorana Neutrinos in the Like-Sign Dilepton Final

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The Standard Model can be extended to include massive neutrinos as observed in the recent oscillation experiments. Perhaps the most commonly studied model is the type-I seesaw mechanism. This model introduces a new neutrino with a Majorana nature with an unknown mass. In this study we present the potential for the discovery of a Majorana neutrino during the first year of data collection from the Large Hadron Collider. In the analysis we used muon triggers, muon isolation, jet energy corrections, b-tagging, and an examination of the combinatorial background. We conclude that the discovery potential can be reached in the first year of running at the LHC at 10 TeV startup collision energy with the CMS detector for the Majorana neutrino mass range near 100 GeV.

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