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Search for evidence of Type-III seesaw mechanism in multilepton final states in pp collisions at 13 TeV

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A search for a type-III seesaw signal in events with three or more electrons or muons is presented. The data sample corresponds to 35.9 fb^{-1} of integrated luminosity in pp collisions at 13 TeV collected by the CMS experiment at the LHC in 2016. The signal is sought after in final states with at least three leptons, and has diverse kinematic properties. The primary selection is based on the number of leptons and the invariant mass of opposite-sign lepton pairs, and helps discriminate the signal against the standard model background. The final optimization for the type-III seesaw signal is based on the sum of leptonic transverse momenta and missing transverse energy, as well as the transverse mass. The observations are consistent with expectations from standard model processes. The results are used to exclude heavy fermions of the type-III seesaw model with masses below 850 GeV for the lepton-flavor democratic scenario.

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