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Searches for new physics in final states with an electron/muon pair at CMS

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This talk reports on two recent searches in final states with an electron/muon pair carried out with the CMS detector at the LHC in proton-proton collisions at a center of mass energy of 8 TeV with an integrated luminosity of 19.7/fb. The first search addresses the possibility of lepton flavor violation (LFV) in interactions involving charged leptons. The invariant mass distribution of electron/muon pairs is examined for narrow resonances that may occur in R-parity violating Supersymmetry or theories featuring a LFV Z' , and for edges that might indicate a mass threshold for the production of quantum black holes. With an invariant mass resolution of the electron/muon pair well below 10% up to the TeV range, the CMS detector is a powerful tool for such shape-based searches for new physics. The second presented result is a search for high-mass ditau events with leptonic decays to an electron/muon final state that is interpreted in terms of Z' resonances and large extra dimensions. In the absence of a significant deviation from the Standard Model expectation, upper limits are set on the signal cross section times branching ratio for the different signal models and translated into bounds on the model parameters.

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