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Search for supersymmetry in final states with two oppositely charged same-flavor leptons and missing transverse momentum in proton-proton collisions at $\sqrt{s} = 13$ TeV



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ABSTRACT: A search for phenomena beyond the standard model in final states with two oppositely charged same-flavor leptons and missing transverse momentum is presented. The search uses a data sample of proton-proton collisions at $\sqrt{s} = 13$ TeV, corresponding to an integrated luminosity of 137 fb^{-1} , collected by the CMS experiment at the LHC. Three potential signatures of physics beyond the standard model are explored: an excess of events with a lepton pair, whose invariant mass is consistent with the Z boson mass; a kinematic edge in the invariant mass distribution of the lepton pair; and the nonresonant production of two leptons. The observed event yields are consistent with those expected from standard model backgrounds. The results of the first search allow the exclusion of gluino masses up to 1870 GeV, as well as chargino (neutralino) masses up to 750 (800) GeV, while those of the searches for the other two signatures allow the exclusion of light-flavor (bottom) squark masses up to 1800 (1600) GeV and slepton masses up to 700 GeV, respectively, at 95% confidence level within certain supersymmetry scenarios.

KEYWORDS: Hadron-Hadron scattering (experiments), Supersymmetry

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