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Search for supersymmetry in events with one lepton and multiple jets in proton-proton collisions at $\sqrt{s}=13$ TeV (Article) [\(Open Access\)](#)

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Abstract

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A search for supersymmetry is performed in events with a single electron or muon in proton-proton collisions at a center-of-mass energy of 13 TeV. The data were recorded by the CMS experiment at the LHC and correspond to an integrated luminosity of 2.3 fb⁻¹. Several exclusive search regions are defined based on the number of jets and b-tagged jets, the scalar sum of the jet transverse momenta, and the scalar sum of the missing transverse momentum and the transverse momentum of the lepton. The observed event yields in data are consistent with the expected backgrounds from standard model processes. The results are interpreted using two simplified models of supersymmetric particle spectra, both of which describe gluino pair production. In the first model, each gluino decays via a three-body process to top quarks and a neutralino, which is associated with the observed missing transverse momentum in the event. Gluinos with masses up to 1.6 TeV are excluded for neutralino masses below 600 GeV. In the second model, each gluino decays via a three-body process to two light quarks and a chargino, which subsequently decays to a W boson and a neutralino. The mass of the chargino is taken to be midway between the gluino and neutralino masses. In this model, gluinos with masses below 1.4 TeV are excluded for neutralino masses below 700 GeV. © 2017 CERN.

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