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Search for supersymmetry with a compressed mass spectrum in the vector boson fusion topology with 1-lepton and 0-lepton final states in proton-proton collisions at $\sqrt{s} = 13$ TeV (Article) [\(Open Access\)](#)

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Abstract

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A search for supersymmetric particles produced in the vector boson fusion topology in proton-proton collisions is presented. The search targets final states with one or zero leptons, large missing transverse momentum, and two jets with a large separation in rapidity. The data sample corresponds to an integrated luminosity of 35.9 fb^{-1} of proton-proton collisions at $s = 13$ TeV collected in 2016 with the CMS detector at the LHC. The observed dijet invariant mass and lepton-neutrino transverse mass spectra are found to be consistent with the standard model predictions. Upper limits are set on the cross sections for chargino ($\chi^{\pm 1}$) and neutralino (χ^0) production with two associated jets. For a compressed mass spectrum scenario in which the $\chi^{\pm 1}$ and χ^0 decays proceed via a light slepton and the mass difference between the lightest neutralino χ^0 and the mass-degenerate particles $\chi^{\pm 1}$ and χ^0 is 1 (30) GeV, the most stringent lower limit to date of 112 (215) GeV is set on the mass of these latter two particles. [Figure not available: see fulltext.]. © 2019, The Author(s).

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