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 p root s=13 TeV

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Abstract

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 root s = 13TeV 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) over tilde (+/-)(1)) and neutralino ((chi) over tilde (0)(2)) production with two associated jets. For a compressed mass spectrum scenario in which the (chi) over tilde (+/-)(1) and (chi) over tilde (0)(2) decays proceed via a light slepton and the mass difference between the lightest neutralino chi(0)(1) and the mass-degenerate particles (chi) over tilde (+/-)(1) and (chi) over tilde (0)(2) 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.

Keywords

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