MOCa 2019: Materia Oscura en Colombia



Contribution ID: 20

Type: not specified

Search for Electroweakinos produced via Vector Boson Fusion with the CMS detector in proton-proton collisions at sqrt(s) = 13 TeV

Monday 30 September 2019 14:30 (30 minutes)

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 $\sqrt{s} = 13$ 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 ($\tilde{\chi}_1^{\pm}$) and neutralino ($\tilde{\chi}_2^{0}$) production with two associated jets. For a compressed mass spectrum scenario in which the $\tilde{\chi}_1^{\pm}$ and $\tilde{\chi}_2^{0}$ decays proceed via a light slepton and the mass difference between the lightest neutralino $\tilde{\chi}_1^{0}$ and the mass-degenerate particles $\tilde{\chi}_1^{\pm}$ and $\tilde{\chi}_2^{0}$ 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.

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