Contribution ID: **340** Type: **Talk**

Search for Supersymmetry with a compressed mass spectrum in VBF topology with 1-lepton final states in pp collisions at $\sqrt{s}$ = 13 TeV with CMS

Wednesday 14 December 2022 12:00 (15 minutes)

Standard Model (SM) is a theory of fundamental particles and their interactions. Despite being a successful theory, SM is unable to offer explanation for the existence of Dark matter (DM), matter-antimatter asymmetry, hierarchy problem, neutrino masses etc. Many models beyond the SM have evolved over the time to explain these limitations. One such model is Supersymmetry (SUSY) which has been proposed to solve these SM problems, and could also provide the DM candidate. A search for supersymmetric electroweakinos ($\widetilde{\chi}_1^{\pm}$, $\widetilde{\chi}_2^0$) produced in the vector boson fusion (VBF) topology in proton-proton collisions at $\sqrt{s}$=13 TeV using the full Run II data collected by the Compact Muon Solenoid (CMS) detector at the Large Hadron Collider (LHC) is presented. The experimental features of VBF processes provide an increased sensitivity for compressed SUSY, compared to traditional searches. The benchmark model for this search is the R-parity conserving Minimal Supersymmetric Standard Model (MSSM), where the lightest neutralino is the canonical dark matter candidate. The dominant SM background processes are estimated using data-driven techniques. In this talk, search strategy, methodology, and the results on the background estimation using various control regions and their validation will be presented.enter code here

Session

Beyond the Standard Model

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Session Classification: WG2-Beyond the Standard Model