

Search for electroweak production of charginos and neutralinos in final states with two boosted hadronically decaying bosons and missing transverse momentum in pp collisions at $\sqrt{s}=13$ TeV with the ATLAS detector

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A search for electroweak production of charginos and neutralinos at the Large Hadron Collider was conducted in 139 fb^{-1} of proton-proton collision data collected at a center of mass energy of $\sqrt{s} = 13 \text{ TeV}$ with the ATLAS detector. This search utilizes fully hadronic final states with missing transverse momentum to identify signal events with a pair of charginos or neutralinos that subsequently decay into high- p_T gauge or Higgs bosons as well as a lighter chargino or neutralino. The light chargino or neutralino creates missing transverse momentum and each of the bosons can decay to light- or heavy-flavor quark pairs. Fully hadronic final states have a large branching ratio compared to leptonic or semi-leptonic decays, probing high-mass signals which have a smaller production cross-section, giving strong motivation to explore this final state. The inclusion of more signal leads to more background, by exploiting boosted boson tagging techniques the additional background can be suppressed. This boson tagging is achieved by reconstructing and identifying the high- p_T SM bosons using large-radius jets and their substructure. No significant excess is found beyond standard model expectations. Various assumptions in decay branching ratios and the type of LSP were made to set exclusion limits on wino or higgsino production at a 95% confidence level. These excluded a mass of 1050 and 900 GeV for the wino and higgsino respectively when the lightest SUSY particle has a mass below 400 and 250 GeV.

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