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Why stop at 2 tops? Search for exotic production of top quarks in final states with same-sign leptons and b-jets at 13 TeV

An analysis is presented of events containing jets including at least one b-tagged jet, sizable missing transverse momentum, and at least two charged leptons including a pair of the same electric charge, with the scalar sum of the jet and lepton transverse momenta being large. Standard Model processes rarely produce these final states, but several models of physics beyond the Standard Model predict an enhanced production rate of such events. Specific models with this feature are considered here: vectorlike T, B, and T5/3 quark pair production, and fourtopquark production under three scenarios (Standard Model, contact interaction, and extra dimensions). A data sample of 3.2 fb⁻¹ of pp collisions at a center-of-mass energy of $\sqrt{s}=13$ TeV recorded by the ATLAS detector at the Large Hadron Collider is used in this analysis. Several signal regions are defined, in which the consistency between the data yield and the background-only hypothesis is checked, and 95% confidence level limits are set on various signal models.

Summary

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