



Article No. 5

Search for top squarks in final states with two top quarks and several light-flavor jets in proton-proton collisions at $\sqrt{s} = 13$ TeV.

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Abstract

Many new physics models, including versions of supersymmetry characterized by R-parity violation (RPV), compressed mass spectra, long decay chains, or additional hidden sectors, predict the production of events with top quarks, low missing transverse momentum, and many additional quarks or gluons. The results of a search for new physics in events with two top quarks and additional jets are reported. The search is performed using events with at least seven jets and exactly one electron or muon. No requirement on missing transverse momentum is imposed. The study is based on a sample of proton-proton collisions **at $\sqrt{s} = 13$ TeV**. Corresponding to 137 fb^{-1} of integrated luminosity collected with the CMS detector at the LHC in 2016–2018. The data are used to determine best fit values and upper limits on the cross section for pair production of top squarks in scenarios of RPV and stealth supersymmetry. Top squark masses up to 670 (870) GeV are excluded at 95% confidence level for the RPV (stealth) scenario, and the maximum observed local signal significance is 2.8 standard deviations for the RPV scenario with top squark mass of 400 GeV.