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Search for the pair production of light top squarks in the $e^{+/-}\mu^{+/-}$ final state in proton-proton collisions at root $s=13$ TeV

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Abstract

A search for the production of a pair of top squarks at the LHC is presented. This search targets a region of parameter space where the kinematics of top squark pair production and top quark pair production are very similar, because of the mass difference between the top squark and the neutralino being close to the top quark mass. The search is performed with 35.9 fb⁻¹ of proton-proton collisions at a centre-of-mass energy of root $s = 13$ TeV, collected by the CMS detector in 2016, using events containing one electron-muon pair with opposite charge. The search is based on a precise estimate of the top quark pair background, and the use of the M-T2 variable, which combines the transverse mass of each lepton and the missing transverse momentum. No excess of events is found over the standard model predictions. Exclusion limits are placed at 95% confidence level on the production of top squarks up to masses of 208 GeV for models with a mass difference between the top squark and the lightest neutralino close to that of the top quark.

Keywords

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