

Search for top squark production in fully-hadronic final states in proton-proton collisions at $\sqrt{s}=13$ TeV

Monday, 12 July 2021 15:00 (15 minutes)

A search for production of the supersymmetric partners of the top quark, top squarks, is presented. The search is based on proton-proton collision events containing multiple jets, no leptons, and large transverse momentum imbalance. The data were collected with the CMS detector at the CERN LHC at a center-of-mass energy of 13 TeV, and correspond to an integrated luminosity of 137 fb⁻¹. The targeted signal production scenarios are direct and gluino-mediated top squark production, including scenarios in which the top squark and neutralino masses are nearly degenerate. The search utilizes novel algorithms based on deep neural networks that identify hadronically decaying top quarks and W bosons, which are expected in many of the targeted signal models. No statistically significant excess of events is observed relative to the expectation from the standard model, and limits on the top squark production cross section are obtained in the context of simplified supersymmetric models for various production and decay modes.

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Session Classification: Beyond Standard Model

Track Classification: Beyond Standard Model Physics