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Volume 2018, Issue 9, 1 September 2018, Article number 65Search for top squarks decaying via four-body or chargino-mediated modes in single-lepton final states in proton - proton collisions at $\sqrt{s} = 13$ TeV (Article) [\(Open Access\)](#)Sirunyan, A.M.^a, Tumasyan, A.^a, Adam, W.^b, Ambrogio, F.^b, Asilar, E.^b, Bergauer, T.^b, Brandstetter, J.^b, Brondolin, E.^b, Dragicevic, M.^b, Erö, J.^b, Escalante Del Valle, A.^b, Flechl, M.^b, Frühwirth, R.^{b,gt}, Ghete, V.M.^b, Hrubec, J.^b, Jeitler, M.^{b,gt}, Krammer, N.^b, Krätschmer, I.^b, Liko, D.^b, Madlener, T.^b, Mikulec, I.^b, Rad, N.^b, ^c[View additional authors](#) ^aYerevan Physics Institute, Yerevan, Armenia^bInstitut für Hochenergiephysik, Wien, Austria^cInstitute for Nuclear Problems, Minsk, Belarus[View additional affiliations](#)

Abstract

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A search for the pair production of the lightest supersymmetric partner of the top quark ($t \sim 1$) is presented. The search focuses on a compressed scenario where the mass difference between the top squark and the lightest supersymmetric particle, often considered to be the lightest neutralino (χ^0), is smaller than the mass of the W boson. The proton - proton collision data were recorded by the CMS experiment at a centre-of-mass energy of 13 TeV, and correspond to an integrated luminosity of 35.9 fb^{-1} . In this search, two decay modes of the top squark are considered: a four-body decay into a bottom quark, two additional fermions, and a χ^0 ; and a decay via an intermediate chargino. Events are selected using the presence of a high-momentum jet, significant missing transverse momentum, and a low transverse momentum electron or muon. Two analysis techniques are used, targeting different decay modes of the $t \sim 1$: a sequential selection and a multivariate technique. No evidence for the production of top squarks is found, and mass limits at 95% confidence level are set that reach up to 560 GeV, depending on the $m(t \sim 1) - m(\chi^0)$ mass difference and the decay mode. [Figure not available: see fulltext.] © 2018, The Author(s).

SciVal Topic Prominence

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