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Volume 78, Issue 9, 1 September 2018, Article number 707Search for third-generation scalar leptoquarks decaying to a top quark and a τ lepton at $\sqrt{s}=13\text{TeV}$ (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, Del Valle, A.E.^b, Flechl, M.^b, Friedl, M.^b, Frühwirth, R.^b, Ghete, V.M.^b, Grossmann, J.^b, Hrubec, J.^b, Jeitler, M.^b, König, A.^b, Krammer, N.^b, Krätschmer, I.^b, Liko, D.^b,[View additional authors](#) [v](#)^aYerevan Physics Institute, Yerevan, Armenia^bInstitut für Hochenergiephysik, Vienna, Austria^cInstitute for Nuclear Problems, Minsk, Belarus[View additional affiliations](#) [v](#)

Abstract

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A search for pair production of heavy scalar leptoquarks (LQs), each decaying into a top quark and a τ lepton, is presented. The search considers final states with an electron or a muon, one or two τ leptons that decayed to hadrons, and additional jets. The data were collected in 2016 in proton–proton collisions at $s=13\text{TeV}$ with the CMS detector at the LHC, and correspond to an integrated luminosity of 35.9fb^{-1} . No evidence for pair production of LQs is found. Assuming a branching fraction of unity for the decay $LQ \rightarrow t \tau$, upper limits on the production cross section are set as a function of LQ mass, excluding masses below 900GeV at 95% confidence level. These results provide the most stringent limits to date on the production of scalar LQs that decay to a top quark and a τ lepton. © 2018, CERN for the benefit of the CMS collaboration.

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Topic: jets | production | parton shower

Prominence percentile: 99.875 [i](#)

Funding details

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