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Search for heavy fermionic partner of the top quark with charge 5/3 in the single leptonic channel using CMS Run 2 Data

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With the discovery of the Higgs boson in 2012 by the CMS and ATLAS experiments, searches for new heavy particles (such as vector-like quarks) have ensued in hope of solving the hierarchy problem. In this talk, I will be discussing the search for the X5/3, a strongly interacting fermionic partner of the top quark with charge +5/3. Left-handed and right-handed coupling of the X5/3 to W bosons are considered separately. The search is conducted using the CMS datasets collected in 2017 and 2018. The data were collected at a center-of-mass energy of sqrt(s) = 13 TeV with the CMS detector, corresponding to an integrated luminosity of 41.5 fb-1 (60 fb-1) in 2017 (2018). The search looks for events with pair production of an X5/3 and its antiparticle, which subsequently decay to a top quark and W boson. To enhance signal separation, the search is constructed to only look for events where one W boson decays to a lepton and neutrino, while the other three W bosons decay hadronically. Limits on the cross section will be presented and compared to previous results.

Are you are a member of the APS Division of Particles and Fields?

Yes

Primary author: SIMPSON, Farrah (Brown University (US))

Presenter: SIMPSON, Farrah (Brown University (US))

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