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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 FARRAH SIMPSON, Brown University, CMS COLLABORATION COLLABORATION — With the discovery of the Higgs boson in 2012 by the CMS and ATLAS experiments, searches for new heavy particles have ensued in hope of solving the hierarchy problem. In this talk, I will be discussing the search for the $X_{5/3}$, a strongly interacting fermionic partner of the top quark with charge $+5/3$. Left-handed and right-handed coupling of the $X_{5/3}$ to W bosons are considered separately. The search is conducted using the CMS Run 2 datasets collected in 2017 and 2018. Data was collected with the CMS detector at a luminosity of 41.5 fb^{-1} and a center-of-mass energy of $\sqrt{s} = 13 \text{ TeV}$. The search looks for events with pair production of an $X_{5/3}$ and its antiparticle which subsequently decay to a top and W boson. To enhance signal separation, the search is constructed to only look for events where one W 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. In addition, I will be discussing the preliminary findings from an additional theory interpretation for the search: events where the $X_{5/3}$ and its antiparticle decay to a top quark and a charged Higgs boson.

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