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Search for Vector-Like-Quarks T/B in Same-Sign Dilepton and Multi-lepton Final States at $\sqrt{s} = 13$ TeV JESS WONG, Brown University, CMS COLLABORATION COLLABORATION

— Discovery of a Higgs Boson with mass near 125GeV in 2012 marked one of the most important milestones in particle physics. The low mass of Higgs with diverging loop corrections adds motivation to look for new physics Beyond the Standard Model. Several BSM theories introduced new heavy quark partners(vector-like quarks) with mass in TeV scale. In particular, the vector-like top quark(T) can cancel the largest correction due to top quark loop,which is one of the main contributions to the divergence,and stabilize the scalar Higgs mass. This analysis searches for pair production of vector-like T or B quark with charge $2e/3$ and $e/3$ in proton-proton collisions at 13TeV at the LHC. We focus on events with final state of same-sign dilepton pair and multiple(3 or more) leptons. Data was collected by the CMS detector at the LHC in 2017 and 2018 with integrated luminosities of 41.5 and 59.7fb^{-1} . Besides Standard Model processes, lepton misidentification is a significant background source in both channels. *Identification is a background for the SS dilepton channel. They are estimated by data driven methods. With the estimated backgrounds, data, and uncertainties, we calculate the upper limit on TT and TE .*

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