



Preliminary draft 10:48 7 December 2023

7 December 2023
di.wang@cern.ch

Search for single Vector-Like Quarks with the Run 2 data of the CMS experiment

Di Wang

Deutsches Elektronen-Synchrotron DESY, Notkestraße 85, D-22607
Hamburg

Abstract

As an extension of the standard model, Vector Like Quarks provide a possible solution to various unsolved issues, such as the hierarchy problem. This analysis focuses on the single production of the vector-like top quark T' , in the decay channel $T' \rightarrow tH$ ($H \rightarrow WW$), in the final state with two opposite sign leptons. The analysis is based on data collected by CMS Run 2, corresponding to an integrated luminosity of 137 fb^{-1} . The di-lepton final state includes the di-electron channel, the di-muon channel, and the electron-muon channel. A cut-based event selection strategy was designed, followed by a mass reconstruction method based on the χ^2 sorting algorithm and neutrino kinematic approximations. A preliminary data-MC comparison and limits based on MC data will be presented.
