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

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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 $T' \to tH$ $(H \to WW)$, 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.