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A Search for Vector-Like Leptons: Compact Analysis

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The Standard Model (SM) conveys our fundamental understanding of matter and its interactions in the universe, yet within the current Standard Model, there remain disagreements. Theoretical extensions of the Standard Model are being developed in hopes to resolve these conflicts. Several SM extensions predict the existence of a new type of particle, the vector-like lepton (VLL). In a proposed search for vector-like leptons, we make use of data produced by proton-proton collisions at the Large Hadron Collider and collected by the Compact Muon Solenoid (CMS). This analysis focuses the search for pair-produced vector-like leptons in the context of two SM lepton final states. Alongside this two-lepton signal, there exist various SM processes with similar final states, a few being ttbar production, DY+jets, Di-boson production. This study examines several kinematic variables to establish distinctive characteristics between signal and background with the intention to eventually discern the absence or presence of vector-like lepton signal as analyzed in Run II data from 2018.

[in-person]

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