

Charged Lepton Flavor Violation in a Lepton Flavor Portal Matter Model

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Increasing attention has been given recently to the theory and phenomenology of portal matter (PM) models—a BSM framework in which the Standard Model (SM) local gauge symmetry group is augmented by a local dark group $U(1)_D$, of which the mediator is the dark photon, and kinetic mixing between $U(1)_D$ and the SM hypercharge is generated at one loop by the PM fields. The case in which the PM are vector-like leptons (VLL) is of particular interest for the study of precision measurements of the leptonic sector. Here we study models with leptonic PM and additional SM vector-like leptons that are neutral under the dark gauge group. We analyze simple models that are consistent with direct and indirect limits on such new states. Moreover, given the current stringent charged lepton flavor violation (CLFV) constraints, and the prospects for further limits or discovery at forthcoming experiments, we examine the bounds on general couplings of the leptonic PM and VLL to the three SM lepton generations within this framework.

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