

Search for Charged Lepton Flavor Violation at future lepton colliders with Z' model

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Charged lepton flavor violation (CLFV), poses a compelling indicator of potential physics beyond the standard model by violating the conservation of lepton flavor. A model is utilized featuring an additional Z' gauge boson to conduct an extensive comparative analysis of CLFV investigations at future lepton collider facilities, including a 240 GeV electron-positron collider and a muon collider at the TeV scale. Employing fast Monte-Carlo simulations and data analyses, we evaluate the detection prospects for Z' -induced CLFV interactions, specifically targeting the $e\mu$, $e\tau$, and $\mu\tau$ couplings. The results are compared with the existing and anticipated limits determined by low-energy experiments and the high-energy pursuits at the LHC. The sensitivity on the τ related CLFV coupling strength can be significantly improved in comparison to the current best constraints and prospect constraints.

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