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Distinguishing Lepton Flavor Violating Signals from Neutral and Doubly-Charged Scalars at Future Lepton Colliders

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Many new physics scenarios beyond the Standard Model (SM) often necessitate the existence of new neutral and/or doubly-charged scalar fields, which might couple to the SM charged leptons in a flavor violating way, while evading all existing constraints. At future lepton colliders like CLIC the neutral and doubly-charged scalar might induce the lepton flavor violating (LFV) signals with the same final states like e+ e- mu+ mu- and e+ e+ mu- mu-. However, the kinetic distributions of charged leptons such as the invariant masses m_{e+ mu+} and m_{e+ mu-} can be used to distinguish clearly the neutral and doubly-charged scalar mediated processes.

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