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Lepton flavor violating decays lj → liγ in the U(1)XSSM model within the Mass Insertion Approximation

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Three singlet new Higgs superfields and right-handed neutrinos are added to MSSM to obtain U(1)XSSM model. Its local gauge group is SU(3)C × SU(2)L × U(1)Y × U(1)X. In the framework of U(1)XSSM, we study muon anomalous magnetic moment and lepton flavor violating decays lj → liγ(j = 2, 3;i = 1, 2) within the Mass Insertion Approximation(MIA). Through the MIA method, we can find the parameters that directly affect the analytical result of the lepton flavor violating decays lj → liγ, which make our work more convenient. We want to provide a set of simple analytic formulas for the form factors and the associated effective vertices, that may be very useful for future phenomenological studies of the lepton flavor violating decays. According to the accuracy of the numerical results which the influence of different sensitive parameters, we come to the conclusion that the non-diagonal elements which correspond to the generations of the initial lepton and final lepton are main sensitive parameters and lepton flavor violation(LFV) sources. This work can provide a clear signal of new physics(NP).

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