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Explaining muon $g-2$ anomaly in a non-universal $U(1)_X$ extended SUSY theory

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It is presented a non-universal $U(1)_X$ extension to the Standard Model with two scalar doublets, two scalar singlets, three additional quark singlets, two lepton singlets and three generations of right-handed and Majorana neutrinos is made to explain lepton mass hierarchy and muon anomalous magnetic moment in a chiral anomaly free framework. Besides, neutrino mass generation is achieved by implementing an inverse seesaw mechanism and it is found that the lightest fermions are tree-level massless but massive at one-loop level. Finally, the conditions that recreate the PMNS matrix and the Higgs boson as the lightest scalar are obtained to make a numerical approach to muon $g - 2$. It is found that only contributions due to exotic neutrinos interacting with charged scalars are relevant, though they are negative. Nevertheless, they might explain the anomaly depending on the order of magnitude of v_χ which is achieved in the supersymmetric scenario when the contributions of exotic neutrinos interacting with W gauge bosons are positive and no longer negligible..

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