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Lepton flavor enrichment and the muon $g-2$ contribution through slepton loops

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Fermilab recent results on muon's anomalous magnetic moment, improves its precision measurement, resulting in a discrepancy from SM close to five sigma. This result tightens at least one corner of the Standard Model, which otherwise has also been stretched by allowing neutrino mixing. The above could represent a window where new physics can show its nature. The SM can be seen as an effective theory at low energies and the higher energy physics would manifest discreetly in processes as NLO corrections. In this work we present a specific flavor structure within the MSSM which allows mixing within second and third families of fermions through supersymmetric one-loop diagrams. We explore the consequences of this structure in flavor violation processes for the charged leptonic sector. We found scenarios that solves the $g-2$ muon discrepancy between theory and experiment, exploring also the consequences at NLO to $BR(\tau \to \mu\gamma)$ and $BR(h^0 \to \tau\mu)$; we complete the analytical calculation without invoking the {\it Mass Insertion Approximation}.

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