

A viable L_e-L_μ model with $\mu \rightarrow e$ violation

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We extend the Standard Model gauge group by $U(1)_{L_e-L_\mu}$ and introduce two scalars, a doublet and a singlet, that are charged under this new group and have lepton flavour violating couplings. Since in this model $\mu \rightarrow e$ processes can only be mediated by $\mu \rightarrow \tau \times \tau \rightarrow e$ interactions, bounds from $\mu \rightarrow e$ transitions can be avoided while allowing for accessible new physics. We consider a Z' boson with a mass of $M_{Z'} \simeq 10$ GeV and a gauge coupling $g' \simeq 10^{-4}$, which is in reach of Belle-II. Neutrino masses and mixing angles can also be accounted for if sterile neutrinos are added to the spectrum.

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