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A radiative lepton model in a non-invertible fusion rule

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We propose a new mechanism wherein the electron and muon masses are generated at the one-loop level following the dynamical violation of the Ising fusion rule symmetry. This rule, being the minimal symmetry required to realize our model, also plays a crucial role in the neutrino sector. There, while neutrino masses are likewise generated at one loop, the Ising fusion rule stabilizes the particles inside the loop, effectively functioning as an unbroken Z2 symmetry to all orders. We subsequently investigate lepton flavor-violating processes, the muon ' s anomalous magnetic dipole moment, and the relic density of dark matter. For the latter, we identify a singlet boson as our dark matter candidate and provide an initial estimate of its relic density via the annihilation cross section. Finally, we present results for both the dark matter annihilation cross section and the muon g – 2 that are consistent with neutrino oscillation data and satisfy the constraints from lepton flavor violation.

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