

# Muon and electron $g-2$ in a $Z'$ model with vector-like fermions

*Wednesday, 18 December 2019 15:15 (30 minutes)*

We consider a simple renormalisable and gauge-invariant model in which a massive new  $Z'$  boson has couplings only to the electron and muon and their associated neutrinos, arising from mixing with a heavy vector-like fourth family of leptons. Within this model, we discuss the contributions to the electron and muon anomalous magnetic moments from  $Z'$  exchange, subject to the constraints from  $\mu \rightarrow e\gamma$  and neutrino trident production. Using analytic and numerical arguments, we find that such a  $Z'$  model can account for either the electron or the muon  $g-2$  anomalies while remaining consistent with the experimental constraints from  $\mu \rightarrow e\gamma$  and neutrino trident production, but not both simultaneously.

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**Session Classification:** Parallel Session 1