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The muon magnetic moment: to the 2HDM and beyond

The recent measurement of the muon $g-2$ anomaly continues to defy a Standard Model explanation. Although such anomaly can be accommodated within the framework of two Higgs doublet models, one of the most popular scalar sector extensions, the allowed parameter space has been further restricted due to conflicts with several constraints. However, if one includes extra fermion content in the form of a generation of vector-like leptons that do not mix with the muon, the allowed parameter range that explains the anomaly is further extended, with previous issues being avoided. However, a new one appears. In this work we update previous analyses within the 2HDM alone and extend them with a new generation of vector-like leptons.

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