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Heavy leptons and the muon anomalous magnetic moment

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The recently updated measurement of the muon anomalous magnetic moment strengthens the motivations for new particles beyond the Standard Model. We discuss two well-motivated 2HDM scenarios with vectorlike leptons as well as the Standard Model extended with vectorlike lepton doublets and singlets as possible explanations for the anomalous measurement. In these models we find that, with couplings of order 1, new leptons as heavy as 8 TeV can explain the anomaly, well out of reach of expectations for the LHC. We summarize the implications of future precision measurements of Higgs- and Z- boson couplings which can provide indirect probes of these scenarios and their viability to explain the anomalous magnetic moment of the muon.

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