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## $W$ – mass and lepton $g - 2$ in extended inert 2HDM

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The new muon  $g - 2$  measurement yields about 5.1 sigma deviation from the Standard Model (SM) prediction. Moreover, the measurement of the  $W$  boson mass performed by the CDF experiment at the Tevatron shows a significant deviation not only from the SM value but also with the other precision measurements performed at LEP and LHC. In this work, we address these two discrepancies by extending the inert two Higgs Doublet Model (2HDM) with a SM gauge singlet complex scalar field and a singlet Vector-like Lepton (VLL) field. We obtain the allowed parameter space constrained from the Higgs decays to gauge Bosons at LHC, LEP II data and electro-weak precision measurements. This constrained parameter space is used to calculate the anomalous magnetic moment of leptons and  $W$  – boson mass. We find that the parameter space of the model constrained from the electroweak precision experiments can simultaneously explain the  $W$  – boson mass and lepton magnetic moment anomalies.

### Reference publication/preprint

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### Designation

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