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Muon g – 2 and W-mass in a framework of colored scalars: an LHC perspective

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A color octet isodoublet can have esoteric origins and it complies with minimal flavour violation. In this study, we take a scenario where the well known Type-X Two-Higgs doublet model is augmented with a color octet isodoublet. We shed light on how such a setup can predict the recently observed value for the W-boson mass. The two-loop Barr-Zee contributions to muon g-2 stemming from the colored scalars are evaluated. It is subsequently found that the parameter space compatible with the observed muon g-2 gets relaxed w.r.t. what it is in the pure Type-X 2HDM by virtue of the contribution from the colored scalars. The extended parameter region therefore successfully accounts for both the W-mass and muon g-2 anomalies simultaneously. Finally, a collider signature leading to a relevant final state is explored at the 14 TeV LHC using both cut-based and multivariate techniques. Such a signal can confirm the existence of both colorless as well colored scalars that are introduced by this framework.

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