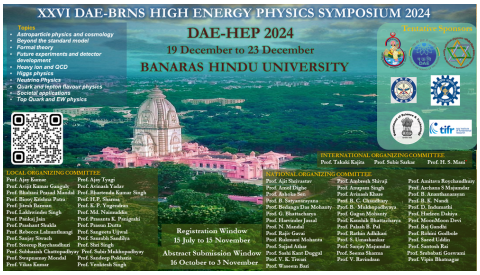

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Exploring TeV-Scale Vector Leptoquarks as Solutions to Magnetic Dipole Moment Anomalies

Precision measurements of charged lepton dipole moments provide valuable insights into physics beyond the Standard Model. We explore the parameter spaces of TeV-scale vector leptoquarks (LQs) relevant to these observables, focusing on the magnetic moment discrepancy $(a_\mu^{\rm exp} - a_\mu^{\rm SM})$ and constraints from the LHC. Our analysis shows that only the U_1 and V_2 LQ models can explain the observed positive shift in the muon magnetic moment anomaly through chirality-flipping contributions with order-one LQ-quark-lepton couplings at one loop level. Additionally, we examine how these two LQ types align with recent electron dipole moment and Atomic Parity Violation(APV) measurements, demonstrating their compatibility with current experimental bounds.

Field of contribution

Phenomenology

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