

Getting chirality right: scalar leptoquarks as a simultaneous solution to the electron and muon $g-2$ anomalies

Tuesday, 11 April 2023 10:07 (22 minutes)

Anomalies in the flavor sector have attracted significant attention in recent years. Of particular interest for this talk are those in the muon and electron magnetic dipole moments: the so-called $g-2$ anomalies. The present status of these could point towards the requirement for new physics that couples differently to leptons and muons. I will review the status of scalar leptoquark models as candidates for ameliorating these anomalies, focussing specifically on leptoquarks which have couplings to both left- and right-handed charged fermions as these can have an enhanced effect. We consider the case in which the electron and muon sectors are decoupled, and Yukawa couplings are specified using an up-type quark mass-diagonal basis. This allows us to identify a previously overlooked region of parameter space, where strong constraints from lepton flavor violating decays may be avoided. Whether or not these anomalies linger as the experimental landscape develops is an open question. Nonetheless, I will briefly outline why models capable of generating this type of signature are well-motivated for further study. This talk will be based on arXiv:2002.12544 and arXiv:2110.03707.

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Session Classification: Flavor

Track Classification: Flavour