

$g - 2$ Model Building with Portal Matter

Saturday 29 April 2023 16:45 (15 minutes)

In this talk, I discuss recent work on model building for the anomalous magnetic moment of the muon in the framework of so-called “portal matter”, vector-like fermions charged under both the SM hypercharge and a hidden Abelian gauge group $U(1)_D$, which can induce kinetic mixing between the two groups at one loop. The portal matter fields are a well-motivated extension of simplified dark matter models in which the dark matter candidate interacts with the SM via the $U(1)_D$ gauge boson, in which case the loop-induced kinetic mixing from the portal matter is of the appropriate magnitude to recreate the observed dark matter relic abundance for dark matter and dark gauge bosons in the sub-GeV regime. If the portal matter fields are sufficiently light, they may have other significant phenomenological implications, either from direct production in collider experiments or precision effects. I will outline a minimal model of portal matter that can address the anomalous magnetic moment of the muon and discuss the other phenomenological probes of this construction, noting that the ability of the model to address the magnetic moment anomaly is remarkably agnostic about the precise parameters of the dark matter model at low energy.

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