

Phenomenology 2023 Symposium



Contribution ID: 137

Type: not specified

LLPs from photons and charged mesons at beam dumps

Tuesday 9 May 2023 14:45 (15 minutes)

We utilize photon and charged meson fluxes at proton beam targets to produce long lived particles (LLPs) via scattering and decay mechanisms. These particles encompass light scalars and gauge bosons that appear in theories like extended Higgs sectors, $U(1)_{L_\mu - L_\tau}$, $U(1)_{T_{3R}}$ etc. We look at the sensitivities of the above in the context of experiments like ArgoNeuT, MicroBooNe, SBND, ICARUS and the upcoming DUNE experiment. For scenarios that contain muonphilic scalars and/or vectors, these experiments can probe parameters that can explain the current discrepancy in the anomalous magnetic moment of muons. Further, when applied to Higgs Portal Scalars, we see that upcoming experiments are sensitive to masses beyond the current bounds.

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Session Classification: BSM VIII

Track Classification: BSM