Contribution ID: 28

Exploring Inelastic Dark Matter Signatures with DUNE

Thursday 5 December 2024 15:00 (25 minutes)

Inelastic dark matter is a topic of great interest due to its rich phenomenology, which allows for the exploration of particles in the sub-GeV scale. Our study focuses on an inelastic model involving two Majorana fermions, $\chi 1$ and $\chi 2$, mediated by a dark photon and a dark Higgs boson, the latter being responsible for the generation of mass in the dark sector. Given the scale, we concentrated on the Deep Underground Neutrino Experiment (DUNE), taking into account both the On-Axis and Off-Axis detectors. Specifically, we identified an interesting region within the model, compatible with DUNE's constraints, by considering a small mass split between the fermions.

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Session Classification: LHC and Neutrino experiments