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Neutrino upscattering to heavy neutral leptons (HNLs) as an explanation of the MiniBooNE low-energy excess (LEE)

Friday, 8 July 2022 09:45 (15 minutes)

The aim of this presentation is to introduce a dark extension of the SM that communicates to it through three portals: neutrino, vector and scalar mixing, by which it could be possible to explain the LEE at MiniBooNE. In the model, Heavy Neutral leptons are produced by upscattering via a dark photon, with masses around 10 MeV – 2 GeV, and subsequently decay into an electron-positron pair and neutrinos. If sufficiently collimated or asymmetric in energy, these events can be detected as a single shower and explain the MiniBooNE LEE. We show how the model can well reconstruct the energy spectrum. We consider two cases: $3 \nu + 1$ HNL and $3 \nu + 2$ HNLs.

In-person participation

Yes

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