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Dark Sectors and MiniBooNE Low Energy Excess

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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 Low Energy Excess (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 ν + 1 HNL and 3 ν + 2 HNLs.

Primary authors: ABDULLAHI, Asli; Mr MASSARO, Daniele (Alma Mater Studiorum - Università di Bologna / Université Catholique de Louvain); HOEFKEN ZINK, Jaime; HOSTERT, Matheus (Perimeter Institute); PASCOLI, Silvia (Universita e INFN, Bologna (IT))

Presenter: HOEFKEN ZINK, Jaime

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