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Light Dark Matter Analysis Using NO ν A Near Detector

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Dark matter is believed to account for 85% of the matter of the Universe. The lead dark matter candidate is the WIMP (weakly interacting massive particles). Light dark matter refers to WIMP candidates with a mass of less than 1 GeV. The concept of light DM has been developed in order to explain the 511 keV γ -ray from the galactic bulge, as observed by the INTEGRAL satellite. There are a lot of candidates for light DM, and these candidates span a wide range of potential masses and couplings to the visible sector. Probing the vast parameter space of light-dark matter requires a correspondingly broad experimental program which includes neutrino fixed target experiments. NO ν A is a high luminosity long-baseline fixed-target accelerator neutrino experiment at Fermilab that can provide a potentially interesting probe in searching for signatures of DM scattering with electrons in its near detectors. We aim to search for the MeV-scale dark matter particles that might be generated within the NuMI beam and produce detectable electron scattering signals in NO ν A near detector. In this talk, we present our analysis of the single electron events using a simulated sample and show the sensitivity of the NO ν A experiment.

Collaboration / Activity

NO ν A Collaboration**Primary author:** BRAHMA, Barnali (Indian Institute of Technology Hyderabad)**Co-authors:** HIMMEL, Alexander (Fermi National Accelerator Laboratory); GIRI, Anjan (Indian Institute of Technology Hyderabad); MU, Wei (Fermi National Accelerator Laboratory)**Presenter:** BRAHMA, Barnali (Indian Institute of Technology Hyderabad)**Session Classification:** T03 Dark Matter**Track Classification:** Dark Matter