

Searching for Sub-GeV Dark Matter at Fixed Target Neutrino Experiments

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Low mass dark matter theories, if produced as a thermal relic in the early universe, must be accompanied by light mediators in order to obtain the dark matter abundance observed in the present day universe. These light mediators in turn provide a channel for the production of dark matter at fixed target neutrino experiments, producing a relativistic dark matter beam, which could then be detected by neutral-current-like interactions in neutrino detectors. We consider the possibility that fixed target neutrino experiments such as MiniBooNE (see arXiv:1211.2258 for proposal with MiniBooNE collaboration), T2K and MINOS could serve as a new dark matter search avenue, sensitive to sub-GeV dark matter scenarios that would be otherwise undetectable. These experiments are found to provide sensitivity to light stable states that could serve as viable candidates for particle dark matter.

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