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Joshua Berger (U. of Wisconsin-Madison): Searching for Boosted Dark Dark Matter in Large Volume Neutrino Detectors

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We study novel scenarios where thermal dark matter (DM) can be efficiently captured in the Sun and annihilate into boosted dark matter. We study scenarios which can yield viable thermal relic DM with masses O(1)-O(100) GeV. Taking advantage of the energetic deposits that arise when the boosted DM scatters off matter, we propose a detection strategy which uses large volume neutrino detectors. In particular, we focus on the prospects for observing such dark matter in liquid argon detectors, including current experiments such as MicroBooNE and future ones such as DUNE. The tools required to simulate and analyze events in these experiments are presented. We then determine the sensitivity to the parameter space of boosted dark matter models.

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