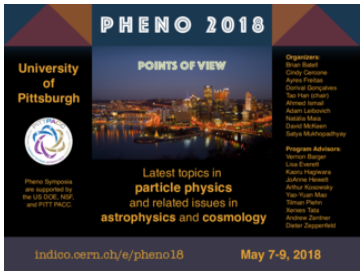

Contribution ID: **574** Type: **parallel talk**

Detecting Boosted Dark Matter with Large Volume Neutrino Detectors

Tuesday 8 May 2018 14:00 (15 minutes)

We study novel scenarios where thermal dark matter (DM) can be efficiently captured in the Sun and annihilate into boosted dark matter. In these scenario, viable thermal relic DM with masses O(1)-O(100) GeV. Taking advantage of the energetic proton recoils that arise when the boosted DM scatters off matter, we propose a detection strategy which uses large volume terrestrial detectors, such as those designed to detect neutrinos or proton decays. Constraints and projections are made for the water Cherenkov detectors Super-Kamiokande and Hyper-Kamiokande. Due tot their lower thresholds, better resolution, and more powerful particle identification, current and proposed liquid argon detectors should have enhanced sensitivity in large parts of parameter space. We discuss issues that arise in studying this model at such experiments and present a Monte Carlo tool suitable for the more complex physics that can arise in these detectors.

Summary

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Session Classification: DM III