



Dipartimento di Fisica
Università di Cagliari
INFN, Sezione di Cagliari



HIGH ENERGY PHYSICS COLLOQUIA

13 novembre 2018 · ore 16:00 · aula C

Christopher McCabe
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SUB-GeV DARK MATTER SEARCH WITH NUCLEAR RECOILS IN NOBLE LIQUIDS

Abstract

Dark matter (DM) particles with mass in the sub-GeV range are an attractive alternative to heavier weakly-interacting massive particles, but direct detection of such light particles is challenging. In this talk, I'll discuss how existing dual-phase xenon detectors can probe the DM-nucleon interaction of DM with a sub-GeV mass through a search for photon or electron emission from the recoiling xenon atom. This allows xenon detectors to set exclusion limits that are comparable to the exclusion limits from experiments that are optimised to search for sub-GeV DM particles. Finally, I'll also discuss how the methods can be generalised to targets other than xenon.

Based on:

- ¹ C. McCabe, "New constraints and discovery potential of sub-GeV dark matter with xenon detectors", *Phys. Rev. D* 96, 043010 (2017) [[arXiv:1702.04730](https://arxiv.org/abs/1702.04730)].
- ² M. J. Dolan, F. Kahlhoefer and C. McCabe, "Directly detecting sub-GeV dark matter with electrons from nuclear scattering", *Phys. Rev. Lett.* 121, 101801 (2018) [[arXiv:1711.09906](https://arxiv.org/abs/1711.09906)].

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