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Doped Semiconductor Devices for sub-MeV Dark Matter Detection

Tuesday 9 May 2023 14:30 (15 minutes)

Dopant atoms in semiconductors can be ionized with ~ 10 meV energy depositions, allowing for the design of low-threshold detectors. We propose using doped semiconductor targets to search for sub-MeV dark matter scattering or sub-eV dark matter absorption on electrons. In this talk, I will show that currently unconstrained cross sections could be tested with a 1 g-day exposure in a doped detector with backgrounds at the level of existing pure semiconductor detectors, but improvements would be needed to probe the freeze-in target.

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