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WITHDRAWN - Electron-recoil Dark Matter in SuperCDMS HVeV Detectors

Tuesday 20 June 2023 10:00 (15 minutes)

The Super Cryogenic Dark Matter Search (SuperCDMS) is a direct detection experiment, optimized for low-mass dark matter searches. Comprised of silicon and germanium crystal bolometers, the experiment utilizes transition-edge sensor (TES) technology to measure small heat signals that result from particle interactions with the bulk crystal. While the experiment is small compared to ton-scale experiments, the low energy threshold of these detectors enables searches for low-mass dark matter. More recently, a gram-scale SuperCDMS prototype detector was developed (HVeV), achieving eV-scale resolutions, and resolving single electron-hole events thanks to the high voltage (HV) applied across the detectors, which amplifies ionizing events. Traditional direct detection searches have relied on dark matter nuclear recoils as their signal. Electron-recoil dark matter (ERDM) is another avenue for dark matter to possibly interact with the Standard Model, and has gained interest recently in searches for light dark matter (LDM) candidates. In this talk, I will present recent updates from Run 4 of the HVeV program at NEXUS (Northwestern EXperimental Underground Site) in Fermilab, probing ERDM candidates such as dark photons, axion-like particles, as well as generic LDM electron-scattering signals.

Keyword-1

dark matter

Keyword-2

particle physics

Keyword-3

experiment

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to Uncover BSM Physics | Découvrir de nouvelles voies vers la découverte : Nouvelles technologies et méthodes pour découvrir la physique au-delà du modèle standard