

Dark matter search with a SuperCDMS low-threshold silicon device

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The Super Cryogenic Dark Matter Search (SuperCDMS) experiment uses high-sensitivity silicon and germanium detectors to directly search for interactions from galactic dark matter (DM). New 1-gram silicon devices instrumented with ultra-high-resolution phonon sensors can be operated both with no electrical bias in the crystal, measuring the recoil energy, and with an applied electric field, which amplifies the recoil events through the Neganov-Trofimov-Luke effect. In this talk, I will present results from a new search for sub-GeV DM candidates using a modest 0.19 gram-day exposure, acquired with a device characterized by a 9.2 eV trigger threshold. I will also present a study of an unexpected low-energy event excess observed in the silicon device, comparing 0V data to a high voltage data set acquired with the same device. The observed excess is consistent with a Cherenkov/scintillation hypothesis and we expect to be able to mitigate it significantly for the next science campaign, extending the sensitivity to low-mass DM.

Reference to paper (DOI or arXiv)

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