



Contribution ID: 122

Type: **Talk**

Robert Calkins (SMU): Sub-GeV mass dark matter with the SuperCDMS experiment

Friday 23 February 2018 10:30 (15 minutes)

Improvements in detector technologies have allowed direct detection experiments access to lower detection thresholds. In the case of the SuperCDMS Soudan experiment, this additional reach has been facilitated by applying strong electric potentials across each detector and taking advantage of the Neganov-Trofimov-Luke (NTL) effect to amplify ionization signals. For dark matter models with electron recoil signatures, the NTL effect is enhanced because of the higher fraction of ionization energy relative to a nuclear recoil of the same recoil phonon energy. The SuperCDMS SNOLAB experiment will start collecting data in 2020 with advanced NTL detectors that have much lower thresholds and improved energy resolution. In this talk, I will discuss analysis efforts to search for sub-GeV mass dark matter particles with existing data and implications for the future SuperCDMS SNOLAB experiment.

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Session Classification: Session 13