Abstract Submitted
for the APR21 Meeting of
The American Physical Society

Nuclear Recoil Calibration at TUNL[1] FRANOIS DE BRIENNE[2], Universite de Montreal — The Super Cryogenic Dark Matter Search (SuperCDMS) uses millikelvin cryogenic germanium and silicon detectors to obtain exceptional sensitivity to low-energy dark matter-nucleus interactions. When a particle interacts with the detector, phonons and electron-hole pairs are produced and detected. The proportion of energy deposited as phonons versus as electron-hole pairs changes with the energy of the event and with the type of scattering, either nuclear recoil or electron recoil. The detector sensitivity to ionization can also be modulated throught the Neganov-Trofimov-Luke effect by using a voltage bias across the detector. Ionization Measurement with Phonons At Cryogenic Temperatures (IMPACT) uses a small silicon SuperCDMS HV-style detector to measure the ionization yield of nuclear recoils. To do so, we used a beam of 55.7keV neutrons at TUNL and measured the scattering of this beam though the detector into 29 liquid scintillator cells placed at various angles to the beam. By comparing the scattering angle to the signal measured in the detector at various detector biases, the ionization yield can be determined. This calibration allows us to measure ionization yield for nuclear recoil energy $<$ 1keV, for which no present results exist.

[1]Universit de Montreal
[2]SuperCDMS collaboration

Franois De Brienne
Universite de Montreal

Date submitted: 07 Jan 2021 Electronic form version 1.4