Contribution ID: **158** Type: **Oral presentation**

First 100 eV nuclear recoil ionization yield measurement in silicon

Monday 18 July 2022 15:20 (20 minutes)

Direct-detection experiments searching for dark matter-nucleon interactions with a charge-based readout are commonly calibrated using sources interacting with the electron of the detector target.
But nuclear and electron interactions produce a different amount of charge for the same energy deposition.
Therefore, the precise knowledge of the nuclear recoil ionization yield is essential for nuclear recoil measurement.

In this talk, we will present the first ionization yield measurement in silicon down to an energy of 100 eV.
A silicon-based SuperCDMS HVeV cryogenic calorimetric detector was operated in a monochromatic neutron beam at the Triangle Universities Nuclear Laboratory (Durham, North Carolina) as part of the IMPACT program.
A coincidence measurement between the silicon detector and a liquid scintillator backing array selects six fixed neutron energies (from 4 keV to 100 eV).
The measured ionization yield is consistent with previous measurements above 2 keV and presents a deviation to lower yield with respect to the Lindhard model. We did not observe a ionization production threshold down to 100 eV.

Authors: Dr NOVATI, Valentina (Northwestern University); ON THE BEHALF OF THE SUPERCDMS COLLABORATION

Presenter: Dr NOVATI, Valentina (Northwestern University)

Session Classification: Parallel 1A - Direct detection I