Contribution ID: **326** Type: **Parallel talk**

Investigating Compton steps in SuperCDMS Si HVeV detectors

Monday 28 August 2023 15:15 (15 minutes)

SuperCDMS is constructing its second-generation experiment at SNOLAB to detect dark matter candidates with masses $\leq$ 10 GeV/c^2 using pure Ge and Si detectors operated at cryogenic temperature. These detectors are of two types. The interleaved Z-sensitive Ionization and Phonon (iZIP) detectors can differentiate between nuclear and electron recoils, providing effective background rejection, while the High Voltage (HV) detectors use high voltage bias to attain excellent energy resolution and low energy threshold. To analyze dark matter search data, detailed energy calibrations of these detectors are necessary. Unlike Ge detectors, in Si detectors, we do not have activation lines that can be used in low energy calibration ($\leq \mathcal{O}$(keV)). However, Si Compton steps can serve as an alternative for energy calibration in this region. The SuperCDMS Si HVeV detectors, with their energy resolution of $\mathcal{O}$(eV) and energy thresholds of $\mathcal{O}$(10 eV), are the perfect instruments to study the Compton steps. This work aims to investigate the K shell and L shell Compton steps at 1.8 keV and 0.1 keV, respectively, for Si HVeV detectors and compare them with calibration derived from optical photons. The understanding of Compton steps for these detectors will aid in calibrating the larger SuperCDMS SNOLAB Si HV detectors. In this conference, we will present the current status of the Compton step calibration analysis for Si HVeV detectors.

Submitted on behalf of a Collaboration?

Yes

Author: Mr DAS (FOR SUPERCDMS COLLABORATION), Sudipta (School of Physical Sciences, National Institute of Science Education and Research, Jatni, 752050, India, and Homi Bhabha National Institute, Training School Complex, Anushaktinagar, Mumbai 400094, India)

Presenter: Mr DAS (FOR SUPERCDMS COLLABORATION), Sudipta (School of Physical Sciences, National Institute of Science Education and Research, Jatni, 752050, India, and Homi Bhabha National Institute, Training School Complex, Anushaktinagar, Mumbai 400094, India)

Session Classification: Dark matter and its detection

Track Classification: Dark matter and its detection