

Compton Step Calibration Feasibility Study for SuperCDMS SNOLAB Detectors

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SuperCDMS SNOLAB will be a direct detection experiment with world-leading sensitivity to low-mass dark matter (DM) that employs cryogenic silicon and germanium calorimeters. SNOLAB detectors are expected to exhibit a non-linear energy response, necessitating calibration signatures across the entire energy range of interest. A calibration method proposed for silicon-based detectors is to use Compton steps that provide two energy signatures at ~ 0.1 keV and ~ 2 keV crucial for sub-GeV DM searches. Compton steps calibration has been explored at test facilities running SuperCDMS silicon high-voltage, eV-scale (HVeV) prototype detectors. In this talk, we will present the status of the Compton step calibration and discuss numerous challenges associated with this technique.

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