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63 - Photoneutron calibration of SuperCDMS detectors

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The SuperCDMS (Cryogenic Dark Matter Search) experiment has pioneered the use of low-temperature solid-state detectors to search for dark matter particle candidates.

Detectors operating in CDMSlite mode allowed searches for particles with masses down to about $2 \text{ GeV}/c^2$ by pushing the analysis threshold to nuclear recoil energies down to about 0.5 keV. However, one of the main uncertainties for the sensitivity for such searches is the lack of an accurate understanding of the nuclear recoil energy scale in this low spectral range.

During the SuperCDMS Soudan operations, data was collected using two low-energy photoneutron sources, ^{88}Y and ^{124}Sb placed next to a ^9Be target. I will describe the implementation and the result of a likelihood analysis used to determine the nuclear recoil energy scale at low energy of the Ge detectors from these data sets. This work will help to improve the sensitivity of the upcoming SuperCDMS SNOLAB experiment, where upgraded detectors will allow searches for particles with masses down to about $0.5 \text{ GeV}/c^2$.

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