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Calibration of CENNS-10 liquid argon detector with 83mKr source

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Abstract: CENNS-10 is scintillation-only liquid argon detector which is stationed at the Spallation Neutrino Source (SNS) at Oak Ridge Laboratory as part of COHERENT collaboration CEvNS research. Knowledge of detector response in the low energy region (5-40 keVee) is extremely important for CEvNS study. To that end, the 83mKr source was prepared and the calibration of CENNS-10 with that source was performed.
In this work, the technique of 83mKr source development is presented. Calibration results as well as its possible application to other low-energy-threshold detectors are discussed. Two different methods of 9.4 keV and 32.1 keV lines separation are presented. Also comparison with argon version of Noble Element Simulation Technique (NEST) prediction is shown.

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