

# Measurements of low-energy nuclear recoils in liquid argon

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The sensitivity of noble liquids detectors to light WIMPs and coherent neutrino-nucleus scattering is a result of detector threshold and low-energy ionization yield for nuclear recoils. We measured for the first time sub-keV electron recoils in a dual-phase argon ionization chamber by observing the peaks in the energy spectrum at 2.82 keV and 0.27 keV, following the K- and L-shell electron capture decay of Ar-37 respectively. Detection of single ionization electrons was also achieved. We also measured the ionization yield of 7 keV nuclear recoils in liquid argon induced by scattering of quasi-monoenergetic neutrons from a collimated and filtered  ${}^7\text{Li}(p,n)$  source. We will discuss the detector characterization and performances, the neutron source design, and the ionization yield experimental results, along with their implications for coherent neutrino scattering and dark matter searches.

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