Abstract Submitted
for the DNP12 Meeting of
The American Physical Society

Measuring the Ionization Yield of Low-Energy Nuclear Recoils in Liquid Argon[1] TENZING JOSHI, University of California Berkeley, ADAM BERNSTEIN, Lawrence Livermore National Laboratory, JONATHON COLEMAN, University of Liverpool, MICHAEL FOXE, Pennsylvania State University, CHRIS HAGMANN, TIMOTHY GUSHUE, Lawrence Livermore National Laboratory, IGOR JOVANOVIC, Pennsylvania State University, KAREEM KAZKAZ, Lawrence Livermore National Laboratory, KOSTAS MAVROKORIDIS, University of Liverpool, VLADIMIR MOZIN, Lawrence Livermore National Laboratory, ERIC NORMAN, University of California Berkeley, SERGEY PEREVERZEV, SAMUELE SANGIORGIO, PETER SORENSEN, Lawrence Livermore National Laboratory — Liquid argon (LAr) has been proposed as a candidate target medium for the detection of coherent neutrino-nucleus scatter (CNNS). Design and deployment of a large (∼10 kg active mass) dual-phase argon detector for the detection of CNNS at a nuclear power plant requires an understanding of the response of LAr to nuclear recoils from 0–6 keV. In this regime the prompt scintillation (S1) signal is below threshold and detection must rely solely on the ionization signal (S2) of the nuclear recoil. We briefly discuss the design and performance of a small prototype dual-phase argon detector and its calibration using ^{37}Ar. We then report on our measurement of the ionization yield of nuclear recoils below 7 keV using this prototype detector with a filtered near-threshold ^{7}Li(p,n) reaction as a neutron source.

[1]This work was funded by lab wide LDRD at LLNL and a DHS grant to the University of California Berkeley.

Tenzing Joshi
University of California Berkeley

Date submitted: 02 Jul 2012 Electronic form version 1.4