Abstract Submitted
for the NEF07 Meeting of
The American Physical Society

Measurement of Majorana background neutron interactions D.V. PEREPELITSA, MIT, LANL, V.E. GUISEPPE, S.R. ELLIOTT, LANL, A. HIME, R.O. NELSON, N. FOTIADES, M.J. DEVLIN, R.C. HAIGHT, LANL, D.-M. MEI, C. KELLER, Z. YIN, University of South Dakota — Recent experiments have shown that free neutrons produced by cosmic-ray muons are expected to contribute to background events in double-beta decay and dark matter experiments. Neutron-induced transitions in natural lead were investigated with a broad spectrum neutron beam during Fall 2006 at the Los Alamos Neutron Science Center. Specific measurements of the γ-ray production cross-section of Pb(n,Xn') reactions allow for improved Monte Carlo simulations of neutron-induced background. We focus on the 2040-keV line (in ^{206}Pb) and 3062-keV double-escape peak (in ^{207}Pb) which overlap with the germanium-76 neutrinoless double-beta decay signature. In addition, the integral γ-ray production cross-sections for the first excited state to ground state in ^{206,207,208}Pb are calculated as a check on this result.

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Date submitted: 14 Sep 2007 Electronic form version 1.4