Abstract Submitted
for the APR07 Meeting of
The American Physical Society

Neutron-Induced Background for Double-Beta Decay Experiments[1] V.E. GUISEPPE, S.R. ELLIOTT, A. HIME, R.O. NELSON, N. FOTIADIS, M.J. DEVLIN, R.C. HAIGHT, LANL, D.-M. MEI, C. KELLER, University of South Dakota, W. TORNOW, A.P. TONCHEV, A. CHYZH, J.H. ESTERLINE, B. FALLIN, C.R. HOWELL, A. HUTCHESON, H.J. KARWOWSKI, J.H. KELLEY, M. KIDD, TUNL — Measurements of neutron excitation in lead, copper, and germanium at TUNL and LANSCE in search of specific excited state decays are important in understanding neutron-induced background in some double-beta decay experiments. The nucleus, in a highly excited state, decays via a γ cascade to the ground state and produces background that may contribute to the next generation of double-beta decay experiments designed to reach the sensitivity of the atmospheric neutrino mass scale (45 meV). Measuring and understanding the high-energy neutron excitations of the shielding and detector materials for neutrinoless double-beta decay experiments are crucial for interpreting results and establishing shielding requirements. Determination of partial γ-ray cross sections provides useful data for benchmarking Monte Carlo simulation of background events. Some specific excited state transitions, such as the $\frac{5}{2}^+$ to $\frac{5}{2}^-$ decay in ^{207}Pb and the 1^- to 1^+ decay in ^{206}Pb, are potentially troublesome for Ge-based double-beta decay experiments.

[1]This work is supported by the DOE and Los Alamos LDRD

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Date submitted: 12 Jan 2007 Electronic form version 1.4