## Abstract Submitted for the DNP07 Meeting of The American Physical Society

Partial  $(n,n'\gamma)$  cross section measurements of Cu, Ge and Pb at 8 and 12 MeV for  $0\nu\beta\beta$  decay<sup>1</sup> E. KWAN, J.H. ESTERLINE, Duke Univ. and TUNL, S. ELLIOT, LANL, B. FALLIN, Duke Univ. and TUNL, S.H. HILDER-BRAND, NCCU, A. HIME, LANL, C.R. HOWELL, A. HUTCHESON, Duke Univ. and TUNL, H.J. KARWOWSKI, UNC and TUNL, J.H. KELLEY, NCSU and TUNL, M.F. KIDD, Duke Univ. and TUNL, D.B. MASTERS, Samford Univ., D. MEI, LANL, A.P. TONCHEV, W. TORNOW, Duke Univ. and TUNL — The possible implications of  $0\nu\beta\beta$  decay have sparked efforts into the verification of the existence of such decays. The detection of such a decay in <sup>76</sup>Ge would confirm that neutrinos are massive Majorana particles and would produce new physics beyond the Standard Model. Measurements of these reactions require an extensive understanding of the background sources. Understanding the potential for neutron induced excitation in the shielding and detector materials is important for designing future double-beta decay experiments. Gamma transitions at 2041 keV, 2615 keV, and 3062 keV either directly interfere with the  $0\nu\beta\beta$  decay detection of <sup>76</sup>Ge at 2040 keV or produce escape peaks within this region of interest. Gamma-ray spectra from the interaction of pulsed mono-energetic neutrons with <sup>nat</sup>Cu, <sup>nat</sup>Ge, and <sup>nat</sup>Pb were measured at TUNL using an array of segmented HPGe Clover detectors. From these spectra, the neutron induced partial cross sections for  $\gamma$  transitions in Cu, Ge, and Pb were deduced at  $E_n=8$  and 12 MeV.

 $^1\mathrm{Supported}$  in part by DOE grant DE-FG02-97ER41033 (Duke) and NSF grant NSF-PHY-05-52723

E. Kwan Duke Univ. and TUNL

Date submitted: 02 Jul 2007

Electronic form version 1.4