Abstract Submitted
for the DNP06 Meeting of
The American Physical Society

Partial neutron induced gamma-ray cross section measurements of Pb at 8 and 12Mev for background subtraction of $0\nu\beta\beta$ decay experiments B.N. SPAUN, Whitworth College, M.A. ATONACCI, Saint Vincent College, A.P. TONCHEV, W. TORNOW, Duke University and TUNL, MAJORANA COLLABORATION — The Majorana collaboration is currently seeking to detect neutrinoless double beta decay ($0\nu\beta\beta$) using ^{76}Ge as both the source and detector. If $0\nu\beta\beta$ decay were detected, it would indicate that neutrinos are there own antiparticles (Majorana particles), and it would provide an absolute mass scale for the three neutrino mass states. However, the predicted half life of such a decay is on the order of 10^{27} years, making its detection above background extremely difficult. Although the ^{76}Ge source and detectors are placed deep underground and shielded with lead, cosmic-ray muons still produce neutrons which interact with the lead shielding to produce gamma rays in the energy region of interest, 2040 keV. In an effort to determine the rate of neutron induced gamma production, we at TUNL, in collaboration with Los Alamos, have recently measured the partial cross section of several key lead transitions using both an 8 MeV and a 12 MeV neutron beam. We are especially interested in the partial cross sections of 2041 keV, 2614 keV, and 3062 keV lead transitions, which will directly interfere with the detection of $0\nu\beta\beta$ decay events. We will present the results of these partial cross section measurements. Supported in part by DOE grant no. DE-FR02-97ER41003 and by NSF no. NSF-05-52723.

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Date submitted: 01 Aug 2006 Electronic form version 1.4