Abstract Submitted
for the DNP07 Meeting of
The American Physical Society

Neutron-Induced Partial Cross-Section Measurements on ^{76}Ge Motivated by The Majorana Project $0\nu\beta\beta$ Decay Search[1] S. HILDERBRAND, NC Central Univ., E. KWAN, C. ANGELL, B. FALLIN, C.R. HOWELL, A. HUTCHESON, H.J. KARWOWSKI, J.H. KELLEY, A.P. TONCHEV, W. TORNOW, TUNL, D.B. MASTERS, Samford Univ., R.S. PEDRONI, NC A&T State Univ., G.J. WEISEL, Penn State Altoona — The goal of the Majorana Collaboration is to study $0\nu\beta\beta$ in order to verify that the neutrino is its own anti-particle; and if so, what is the mass ofthe electron neutrino. Observation of a sharp peak at the $\beta\beta$ endpoint energy will confirm $0\nu\beta\beta$ as a decay mode, and determination of the partial width will determine the matrix element which depends directly on the electron neutrino mass. In order to observe and verify the existence of $0\nu\beta\beta$, it is important to reduce intrinsic, extrinsic,& cosmogenic backgrounds. The Majorana Project will operate with HPGe detectors deep underground to achieve a low-background environment. Recent advances in signal processing and detector design have also enabled scientists to further understand background sources. γ-ray spectra from the interaction of pulsed mono-energetic neutrons with ^{76}Ge were measured at TUNL using segmented HPGe clover detectors. The neutron-induced partial cross-sections for γ transitions in ^{76}Ge were measured at $E_n = 8$ and 12MeV.

[1]Supported by DOE grant DE-FG02-97ER41033 and NSF-05-523327.

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Date submitted: 02 Aug 2007 Electronic form version 1.4