Abstract Submitted
for the DNP13 Meeting of
The American Physical Society

Cross Section Measurements of the ^{76}Ge$(n, n'\gamma)$ Reaction[1] B.P. CRIDER, E.E. PETERS, F.M. PRADOS-ESTÉVEZ, T.J. ROSS, M.T. MCELLISTREM, S.W. YATES, Departments of Chemistry and Physics & Astronomy, University of Kentucky, Lexington, KY 40506, J.R. VANHOY, Department of Physics, United States Naval Academy, Annapolis, MD 21402 — Neutrinoless double-beta decay ($0\nu\beta\beta$) is a topic of great current interest and, as such, is the focus of several experiments and international collaborations. Two of these experiments, Majorana and GERDA, are seeking evidence of $0\nu\beta\beta$ in the decay of ^{76}Ge, where the signal would appear as a sharp peak in the energy spectrum at the Q-value of the reaction plus a small amount of recoil energy, or 2039 keV. Due to the high sensitivity of such a measurement, knowledge of background lines is critical. A study of ^{76}Ga β^- decay into ^{76}Ge [1] revealed a 2040.70(25)-keV transition from the 3951.70(14)-keV level, which, if populated, could potentially be a background line of concern. In addition to β^- decay from ^{76}Ga, a potential population mechanism could be cosmic-ray-induced inelastic neutron scattering. Measurements of the neutron-induced cross section of the 3951.70-keV level have been performed utilizing the ^{76}Ge$(n, n'\gamma)$ reaction at the University of Kentucky at neutron energies ranging from 4.3 to 4.9 MeV.

[1] D.C. Camp and B.P. Foster, Nucl. Phys. **A**177 (1971) 401-417.

[1]This material is based upon work is supported by the U.S. National Science Foundation under grant no. PHY-0956310.

B.P. Crider
Departments of Chemistry and Physics & Astronomy,
University of Kentucky, Lexington, KY 40506

Date submitted: 23 Jun 2013 Electronic form version 1.4