Abstract Submitted
for the DNP07 Meeting of
The American Physical Society

Nuclear Structure Measurements for ($0\nu2\beta$) Decay of ^{76}Ge J.P. SCHIFFER, Argonne National Laboratory, S.J. FREEMAN, University of Manchester, A.C.C. VILLARI, GANIL, Caen, J.A. CLARK, C. DEIBEL, Yale University, S. GROS, Argonne National Laboratory, C.R. FITZPATRICK, University of Manchester, A. HEINZ, Yale University, D. HIRATA, GANIL, Caen, C.L. JIANG, Argonne National Laboratory, B.P. KAY, University of Manchester, A. PARIKH, P.D. PARKER, J. QIAN, Yale University, K.E. REHM, X.D. TANG, Argonne National Laboratory, V. WERNER, C. WREDE, Yale University — There are considerable uncertainties in the theoretical matrix elements for neutrinoless double beta decay. To narrow down the possibilities, we have measured the occupation of valence orbitals, with particular attention to the *differences* between ^{76}Ge and ^{76}Se. Neutron adding and removing transfer reactions were measured at the Yale ESTU tandem, with careful attention to absolute, and especially relative, cross sections. All significant components with a given angular momentum were identified, then sum rules were used to obtain occupation numbers in a consistent manner. Our results indicate that the Fermi surface is considerably more diffuse than those in QRPA used to calculate the $0\nu2\beta$ matrix elements. The differences in neutron occupations appear to be spread over more orbits. *This work was supported in part by the U.S. Department of Energy, Office of Nuclear Physics, under Contracts No. DE-AC02-06CH1135 and DE-FG02-91ER-40609.*

Karl Rehm
Argonne National Laboratory

Date submitted: 06 Jul 2007 Electronic form version 1.4