

Abstract Submitted
for the DNP10 Meeting of
The American Physical Society

**Comparison Between Measured and Calculated Gamow-Teller
Distributions and the Corresponding Electron Capture Rates for pf-shell
Nuclei in Pre-supernova Stars¹**

A.L. COLE, T.S. ANDERSON, Physics Department, Kalamazoo College, R.G.T. ZEGERS, B.A. BROWN, L. UHER, NSCL, JINA, Department of Physics and Astronomy, Michigan State University, G.W. HITT, Khalifa University of Science, Technology & Research — Modeling the evolution of core-collapse and thermonuclear supernovae requires determining the electron capture rates on pf-shell nuclei at astrophysical temperatures and densities. We present results of a systematic comparison of electron capture rates determined from experimental Gamow-Teller Strength ($B(GT)$) distributions to electron capture rates determined from $B(GT)$ distributions calculated with a shell-model code using two different interaction Hamiltonians and from QRPA calculations. The comparisons presented in this work are for 13 stable pf-shell nuclei for which experimentally measured $B(GT)$ distributions have been determined from charge-exchange and beta decay measurements.

¹This work is supported in part by NSF grants PHY-0822648, PHY-0606007, PHY-0758099 and by an award from Research Corporation for Science Advancement.

Arthur L. Cole
Physics Department, Kalamazoo College

Date submitted: 29 Jun 2010

Electronic form version 1.4