

Abstract Submitted
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Determination of Gamow-Teller Strength Distributions and Electron Capture Rates for pf-shell Nuclei in Pre-supernova Stars¹ ARTHUR L. COLE, Physics Department, Kalamazoo College, REMCO G.T. ZEGERS, B. ALEX BROWN, G. WESLEY HITT, LESHAWNA UHER, National Superconducting Cyclotron Laboratory, Joint Institute of Nuclear Astrophysics, Department of Physics and Astronomy, Michigan State University — Modeling the evolution of pre-supernova stars and their collapse requires determining the electron capture rates for pf-shell nuclei. We intend to systematically calculate Gamow-Teller strength $B(GT)$ distributions for all pf-shell nuclei and present preliminary result for the initial calculations. Calculations will be performed with a shell-model code using at least two different interaction Hamiltonians to describe the interaction between the nucleons in the nuclei undergoing electron capture. The resulting $B(GT)$ distributions were used to calculate the corresponding electron capture rates at stellar temperatures and densities relevant to pre-supernova core collapse stars. Calculated $B(GT)$ distributions are compared to experimental measurements if they exist.

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Arthur L. Cole
Physics Department, Kalamazoo College

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