Abstract Submitted
for the DNP19 Meeting of
The American Physical Society

Constraining electron capture rates in core-collapse supernovae for nuclei near N$=$50.[1] REMCO ZEGERS, Michigan State Univ, NSCL E15112 COLLABORATION, NSCL E16006 COLLABORATION — Electron captures on medium-heavy nuclei play an important role in the late stages of the evolution of core-collapse supernovae, just prior to the explosion. In particular, nuclei around N=50, just above ^{78}Ni, have been identified as especially important for the deleptonization of the core. The astrophysical simulations require accurate electron-capture rates. One has to largely rely on theoretical models, which must be benchmarked and guided by experimental data. This work describes a broad effort to improve the electron capture-rates for nuclear astrophysical simulations, focusing on nuclei near N=50. This includes (t,^{3}He) charge-exchange experiments for extracting Gamow-Teller strengths, the comparison with theoretical models used for calculating electron-capture rates for the astrophysical simulations, and results from sensitivity studies by using 1D core-collapse simulations.

[1]This work is supported by the US National Science Foundation PHY-1430152 (Joint Institute for Nuclear Astrophysics Center for Evolution of the Elements) and PHY-1565546

Remco Zegers
Michigan State Univ

Date submitted: 29 Jun 2019 Electronic form version 1.4