Abstract Submitted for the DNP06 Meeting of The American Physical Society

One-Zone x-Ray Burst Model Adjustment KARL SMITH, MATT AMTHOR, National Superconductiong Cyclotron Laboratory, Michigan State University, ALEXANDER HEGER, Los Alamos National Laboratory, EMILY JOHN-SON, Michigan State University, HENDRIK SCHATZ, National Superconductiong Cyclotron Laboratory, Michigan State University — Multi-zone x-ray burst models simulate thermonuclear explosions on the surface of accreting neutron stars. The underlying nuclear reaction sequence in the x-Ray burst is the rp-process. We explored the validity of one-zone approximations as tools to investigate nuclear physics by comparing to a full 1D multi-zone model. A one-zone model uses less computation time to run an x-ray burst than for a multi-zone model. The multi-zone model requires more time because it considers convection within the star. Our goal was to produce a one-zone model to quickly study changes in nuclear reaction rates, if interesting results were found to rerun the conditions with the multi-zone model. By changing the initial composition, temperature, and pressure in the one-zone model, we succeeded to match the x-Ray light curve and final produced ashes of the multizone model.

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