Abstract Submitted
for the APR20 Meeting of
The American Physical Society

Measuring proton-rich reactions with the JENSA gas jet target for X-ray burst models[1] LOUIS WAGNER, Michigan State University, KELLY CHIPPS, Oak Ridge National Laboratory, KONRAD SCHMIDT, Technical University Dresden, HENDRIK SCHATZ, Michigan State University, JENSA COLLABORATION — X-ray bursts (XRB) occur frequently on neutron stars in a binary system and offer unique opportunities to study nucleosynthesis and neutron star properties. The extreme conditions lead to capture reaction pathways on the proton-rich side of the chart of nuclei, where only few reaction rates are experimentally known. To reduce uncertainties in XRB, reactions with high impact on the XRB light curves and ash abundances must be measured experimentally. To study these reactions in the lab, radioactive ion beam accelerators such as the National Superconducting Cyclotron Laboratory (NSCL) or, in the near future the Facility for Rare Isotope Beams (FRIB) are used. To take advantage of these beams the Jet Experiments in Nuclear Structure and Astrophysics (JENSA) gas target system at NSCL is used for direct measurements of alpha induced reactions. Sensitivity studies show that ^{59}Cu(p,α)^{56}Ni competes with the rp-process of ^{59}Cu in XRB and has a big impact on the light curve. The cross section of the reaction can be constrained by the time-inverse reaction ^{56}Ni(α,p)^{59}Cu, because in that direction the ground state contribution dominates the astrophysical reaction rate. The talk presents preliminary results of a ^{56}Ni(α,p)^{59}Cu experiment with JENSA and discusses status and future plans for JENSA.

[1]I acknowledge support from NSF grants PHY-1430152 (JINA CEE) and PHY-1565546 (NSCL).

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Date submitted: 10 Jan 2020 Electronic form version 1.4