Contribution ID: **45** Type: **Oral**

X-ray burst studies with the JENSA gas jet target

Friday, 23 June 2017 09:00 (20 minutes)

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\begin{center}
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%%% Title goes here.
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\TITLE{X-ray burst studies with the JENSA gas jet target}\\[3mm]
%%%
%%% Authors and affiliations are next. The presenter should be
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%%% Abstract proper starts here.
%%%
When a neutron star accretes hydrogen and helium from the outer layers of its companion star, thermonuclear

burning processes enable the αp-process as a break out mechanism from the hot CNO cycle. X-ray burst models predict (α,\,p) reaction rates to significantly affect light curves of X-ray bursts and elemental abundances in the burst ashes.

The Jet Experiments in Nuclear Structure and Astrophysics (JENSA) gas jet target [1] enables the direct measurement of previously inaccessible (α,p) reactions with radioactive beams provided by the rare isotope reaccelerator ReA3 at the National Superconducting Cyclotron Laboratory (NSCL), USA. JENSA is going to be the main target for the recoil separator for capture reactions (SECAR) at the Facility of Rare Isotope Beams (FRIB). Commissioning and first experiments at Oak Ridge National Laboratory (ORNL) showed a highly localized, pure gas target with a density of about 10^{19} atoms per square centimeter.

Preliminary results will be presented from a commissioning experiment at NSCL studying the ^{14}N(α,\,p)^{17}O reaction and from the first direct cross section measurement of the ^{34}Ar(α,\,p)^{37}K reaction.

This research is supported by the National Science Foundation in part under Grant No. PHY-1430152 (JINA Center for the Evolution of the Elements), Grant No. PHY-1419765, Grant No. PHY-1404218, by the U.\,S. Department of Energy, Office of Nuclear Physics, and by the Laboratory Directed Research and Development Program of Oak Ridge National Laboratory, managed by UT-Battelle, LLC, for DoE.
\bigskip

{\small
\noindent [1] K.\,A. Chipps \emph{et al.}, Nucl. Instrum. Methods Phys. Res. Sect. A \textbf{763}, 553 (2014).
}
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Session Classification: Experimental techniques for nuclear astrophysics

Track Classification: Tools, techniques and facilities