Abstract Submitted
for the DNP15 Meeting of
The American Physical Society

Measurement of ^{67,68}Zn Neutron Capture for the weak s-process[1]

KEVIN T. MACON, JEFF C. BLACKMON, B.C. RASCO, LSU, AARON COUTURE, SHEA MOSBY, JOHN M. O'DONNELL, JOHN L. ULLMANN, LANL, TRAVIS BAUGHER, Rutgers — The observed abundance distributions for the heavy elements ($A > 60$) are driven by neutron capture processes. The slow neutron capture process (the s-process) takes place on a timescale of tens of thousands of years and is responsible for the origin of about half the heavy elements. The weak s-process in particular occurs in massive stars and is responsible for the production of a major portion of the elements up to $A = 90$. The s-process path follows close to the stable elements and most reactions can be directly studied in the laboratory using neutron beams. Precise measurements on specific isotopes with low neutron capture cross-sections ($\lesssim$100mb) in the mass $60 < A < 70$ region are important for abundance calculations. In the past decade, new capture measurements with calorimeters have seen large discrepancies with liquid scintillator time-of-flight measurements, requiring new measurements on isotopes with high scatter/capture cross-section ratios. I will present preliminary results from a recent measurement for ^{67,68}Zn using the Detector for Advanced Neutron Capture Experiments at LANSCE. Improved capture cross-sections on these isotopes will significantly reduce uncertainties on the synthesis of elements in the weak s-process.

[1]This work was supported by the U.S. DOE Office of science by award no. DE-FG02-96ER40978

Kevin T. Macon
LSU

Date submitted: 01 Jul 2015 Electronic form version 1.4