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Measuring spin distributions in ^{95}Mo(n,γ) and validation of the surrogate reaction[1] A.S. ADEKOLA, J.A. CIZEWSKI, Rutgers, A. COUTURE, M. DEVLIN, M. JANDEL, LANL, W.A. PETERS, ORAU, J. BURKE, J.E. ESCHER, LLNL — Neutron capture cross sections on unstable nuclei are important quantities for understanding the synthesis of the heavy elements in stars and applications in nuclear energy and nuclear forensics. It is presently not possible to measure directly (n,γ) cross sections on nuclei with $t_{1/2} < 100$ days. The (d, pγ) reaction is a candidate for an indirect or surrogate method to determine (n, γ) reaction cross sections on unstable nuclei. While neutron capture dominates at low l values (s and p waves), charged particle reactions are expected to bring in more angular momentum. The ^{95}Mo(n,γ) cross sections have been measured up to 200 keV. The ^{95}Mo(n,γ) and ^{95}Mo(d, pγ) reactions will be measured to determine the population of the yrast levels as a function of neutron energy and deduce the spin distributions for both (n,γ) and (d, pγ), respectively. The goal is to use the knowledge of the spin distributions in both (n,γ) and the surrogate (d, pγ) to develop a validated prescription to deduce (n,γ) cross sections from (d, pγ) measurements. In this talk, an overview of surrogate technique, our experimental approach and preliminary results of a commissioning ^{75}As(d, pγ) experiment will be presented.

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A. S. Adekola
Rutgers

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