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Validating (d,pγ) as (n,γ) surrogate in normal kinematics[1] J.A. CIZEWSKI, A. RATKIEWICZ, Rutgers, J.T. BURKE, R.J. CASPERSON, J.E. ESCHER, LLNL, G. POTEL, MSU, M. MCCLESKEY, TAMU, STARLITER COLLABORATION — Neutron capture through the s and r processes is responsible for almost all of the synthesis of the heavy elements. However, it is very difficult to measure (n,γ) reactions on unstable nuclei especially when $t_{1/2}$<100 days. Given the importance of (n,γ) reactions for understanding nucleosynthesis and applications in nuclear energy and national security, it is critical that a valid surrogate for (n,γ) be developed. The 95Mo(d,pγ) reaction was measured in normal kinematics at TAMU with the STARLiTER system [1] of segmented annular silicon strip detectors and clover HPGe detectors. Preliminary calculations of the formation of the compound nucleus and Hauser-Feshbach decay reproduce the measured 95Mo(n,γ) cross sections[2]. By incorporating a calculation [3] of the transferred angular momentum in the (d,p) reaction as a function of excitation energy, preliminary analysis reproduces the observed (d,p) gamma-ray transition probabilities as a function of excitation energy. This preliminary analysis and those from using the observed gamma-ray transition probabilities to predict (n,γ) cross sections will be presented. [1] R.J. Casperson et al., Phys. Rev. C 90, 034601 (2014) [2] A.R. De L. Musgrove et al., Nucl. Phys. A 270, 108 (1976) [3] G. Potel, F.M. Nunes, and I.J. Thompson, Phys. Rev C 92, 034611 (2015).

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