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**Single-neutron excitations in $^{96}$Mo from the $^{95}$Mo(d,p) reaction**[1]
SHUYA OTA, Japan Atomic Energy Agency / Rutgers, J.A. CIZEWSKI, A. RATKIEWICZ, S. BURCHER, B. MANNING, S.L. RICE, C. SHAND, Rutgers, J.T. BURKE, R.J. CASPERSON, J.E. ESCHER, N.D. SCIELZO, I. THOMPSON, LLNL, M. MCCLESKEY, Texas A&M, W.A. PETERS, ORAU, R.A.E. AUSTIN, St. Mary's, C.W. BEAUSANG, R.O. HUGHES, T.J. ROSS, Richmond — Uncertainties in neutron capture cross sections can affect $r$-process nucleo-synthesis at late times. Neutron transfer reactions are important in determining direct neutron capture cross sections and may be a promising surrogate for neutron capture when the desired reaction involves short-lived nuclei. As part of the effort to validate (d,p$\gamma$) as a surrogate for neutron capture, the $^{95}$Mo(d,p) reaction was studied at a cyclotron at Texas A&M University with a 12.5-MeV deuteron beam. The reaction protons were measured at forward angles of 30-60° with the STARS (Silicon Telescope Array for Reaction Studies) array of three segmented Micron S2 silicon detectors to populate discrete states below 5 MeV in excitation. This is the first study of the $^{95}$Mo(d,p) reaction. Angular distributions of protons populating low-spin discrete excitations and a comparison with distorted-wave calculations will be presented.

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