Benchmarking \((d, p\gamma)\) as surrogate reaction for \((n, \gamma)\)\(^1\) R. HATARIK, J.A. CIZEWSKI, K. JONES, S.D. PAIN, T. SWAN, Rutgers University, D.W. BARDAYAN, J.C. BLACKMON, Oak Ridge National Laboratory, L.A. BERNSTEIN, J.T. BURKE, F.S. DIETRICH, J.E. ESCHER, M.S. JOHNSON, Lawrence Livermore Natl Laboratory, R. KOZUB, Tennessee Tech University, A. KRONENBERG, Oak Ridge Associated Universities — Neutron capture cross sections on unstable nuclei are important for many applications in nuclear structure and astrophysics. Measuring these cross sections directly is a major challenge and often impossible. In the surrogate reaction technique a desired cross section can be extracted by measuring a different (surrogate) reaction that produces the same compound nucleus. In contrast to neutron capture, a neutron transfer cross section can be measured in inverse kinematics, which allows to measurements of cross sections on short lived-species. To test the feasibility of using a \((d, p\gamma)\) reaction as a surrogate for \((n, \gamma)\), \(^{143}\text{Nd}\) and \(^{145}\text{Nd}\) have been chosen. The goal of this benchmark experiment is to reproduce the known neutron capture cross sections ratio of these isotopes.

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