

Abstract Submitted  
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**(n, $\gamma$ ) by the Internal Surrogate Ratio Method: A Benchmark using  $^{235}\text{U}(\text{d,p})$**  J.M. ALLMOND, University of Richmond, STARS LIBERACE COLLABORATION — The Surrogate Reaction Technique, first proposed in 1970 [1], has recently been under investigation by a Richmond / LLNL / LBNL / Yale collaboration. These studies are currently performed at LBNL using the STARS and LiBerACE detector arrays. Both absolute [1] and ratio [2] methods have been employed to circumvent technical challenges presented by the fabrication of unstable targets and by the production of high-flux neutron beams. The  $^{235}\text{U}(\text{d,p})$  surrogate reaction at 21 MeV benchmarks the (n, $\gamma$ ) cross section by use of the *internal ratio method* (same compound nucleus but different exit channel). The present study marks the first benchmark of the internal ratio method. Previous tests of the Surrogate Ratio Method have focused on determining (n,f) cross sections using the *external ratio method* (different compound nucleus but same exit channel). Results of this study are presented. This work was performed under the auspices of the U.S. Department of Energy under contract numbers DE-FG52-06NA26206 (UR), DE-AC52-07NA27344 (LLNL), and DE-AC02-05CH11231 (LBNL).  
[1]J.D. Cramer and H.C. Britt, Nucl. Sci. Eng. **41**, 177 (1970).  
[2]C. Plettner, *et al.*, Phys. Rev. C **71** 051602 (2005).

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