Determining Cross Sections for Low-Energy Neutron Capture Reactions via the Surrogate method - Recent Progress\textsuperscript{1} JUTTA E. ESCHER, FRANK S. DIETRICH, NICHOLAS D. SCIELZO, Lawrence Livermore National Laboratory — Many reactions of interest to nuclear energy and astrophysical applications cannot be measured directly since they involve short-lived or highly radioactive target nuclei. The Surrogate reaction method is an indirect approach for determining compound-nuclear reaction cross sections via a combination of theory and a transfer-reaction or inelastic-scattering experiment. Past applications of the method have demonstrated that it can provide useful cross section estimates for neutron-induced fission of actinides. Most analyses of fission data carried out so far have made approximations that are expected to break down for situations relevant to extracting (n,\(\gamma\)) cross sections from Surrogate measurements. This presentation focuses on the prospects for employing the Surrogate method to obtain cross sections for neutron capture on unstable nuclei. A brief outline of the approach will be given and recent progress made in moving beyond currently-employed approximations, such as the Weisskopf-Ewing and Ratio approximations, will be discussed. An application of the newly-developed tools to data taken recently by STARS/LiBerACE collaboration for the gadolinium region will be presented.

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