Abstract Submitted
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Measuring Neutron-Induced, Angular-Momentum-Dependent Fission Probabilities Using Direct Reactions[1] JOHNATHON KOGLIN, IGOR JOVANOVIC, Penn State University, JASON BURKE, ROBERT CASPERSON, Lawrence Livermore National Laboratory — The surrogate method has previously been used to successfully measure (n, f) cross sections on a variety of difficult to produce actinde isotopes. These measurements have larger uncertainties at excitation energies below 1.5 MeV where the distribution of angular momentum states populated in the compound nucleus created by neutron absorption differs from that arising from direct reactions. A method to measure the fission probability of individual angular momentum states arising from the $^{239}\mathrm{Pu}(d, pf)$ reaction is under development. This detector system utilizes an array of photovoltaic (solar) cells to measure the angular distribution of fission fragments with high resolution. This distribution uniquely identifies the angular momentum states populated. These are fit to expected distributions of angular momentum states to determine the contribution of each state. Protons are detected with 40 keV FWHM resolution at 16 angles in the forward and backward directions. The matrix obtained from these measurements determines fission probabilities of specific angular momentum states in the transition nucleus. Progress in the development of this system will be presented.

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