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Measurement of Angular-Momentum-Dependent Fission Probabilities of ^{240}Pu[1] JOHNATHON KOGLIN, JASON BURKE, Lawrence Livermore National Laboratory, IGOR JOVANOVIC, Univeristy of Michigan — An experimental technique using the surrogate reaction method has been developed to measure fission probabilities of actinides as a function of angular momentum state of the fissioning nucleus near the fission barrier. In this work, the ^{240}Pu$(\alpha, \alpha f)$ reaction was used as a surrogate for ^{239}Pu(n, f). An array of 12 silicon telescopes positioned at 10 degree intervals from 40 to 140 degrees detect the outgoing reaction particle for identification and measurement of the excitation energy. The angular momentum state is determined by measuring the angular distribution of fission fragments. The expected distributions are predicted from the Wigner d function. An array of 50 photovoltaic (solar) cells detects fission fragments with 10-degree granularity. The solar cells are sensitive to fission fragments but have no response to light ions. Relative contributions from different angular momentum states are extracted from the measured distributions and compared across all α particle scattering angles to determine fission probability at a specific angular momentum state. The first experiment using this technique was recently completed using 37 MeV α particles incident on $^{240)}$Pu. First results will be discussed.

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