Abstract Submitted
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A Measurement of Neutron Polarization Asymmetries in Photofission of Actinides Using Polarized Gamma Rays at HIγS[1] J.M. MUELLER, M.W. AHMED, S.S. HENSHAW, H.J. KARWOWSKI, L. MYERS, B.A. PERDUE, S. STAVE, J.R. TOMPKINS, H.R. WELLER, Triangle Universities Nuclear Laboratory (TUNL), B. DAVIS, D. MARKOFF, North Carolina Central U. (NCCU) — Photofission of ^{235}U, ^{238}U, ^{232}Th, and ^{239}Pu has been studied using 100% linearly polarized, high intensity ($\sim 10^7\gamma/s$), and nearly-monoenergetic gamma-ray beams of energies between 5.6 and 7.0 MeV at the High Intensity Gamma-ray Source (HIγS). An array of 18 liquid scintillating detectors was used to measure prompt fission neutron angular distributions. The ratio of prompt neutron yields parallel to the plane of beam polarization to those perpendicular to this plane was measured as a function of beam and neutron energies. A ratio close to unity was found for ^{235}U and ^{239}Pu while a significant ratio (~ 3) was found for ^{238}U and ^{232}Th at a scattering angle of 90°. A phenomenological model of near threshold photofission is being developed in an attempt to explain this large difference for these isotopes. A simulation, based on our model and using previous measurements of fission fragment angular distributions, is being used to interpret our experimental results.

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