Photofission Neutron Yield Ratios on $^{238}\text{U}$ near $E_\gamma = 6.2$ MeV using Linearly Polarized $\gamma$ rays\(^1\) S. STAVE, M.W. AHMED, N. BROWN, S.S. HENSHAW, J.M. MUELLER, B.A. PERDUE, H.R. WELLER, Duke U/TUNL, H.J. KARWOWSKI, J.R. TOMPKINS, UNC/TUNL, M.S. JOHNSON, LLNL — Neutron yields and the ratios of the yields measured parallel to the plane of $\gamma$-ray polarization over the yields perpendicular to the plane of polarization ($I_{\text{par}}/I_{\text{perp}}$) have been measured using a U-238 target for the first time near the $(\gamma, n)$ threshold of $E_\gamma \approx 6.2$ MeV. Measurements were performed at $\gamma$-ray energies of 5.7 MeV (near the photofission threshold) through the $(\gamma, n)$ threshold up to 6.5 MeV. The $I_{\text{par}}/I_{\text{perp}}$ data taken with the nearly 100% linearly polarized beams at HI$\gamma$S have values ranging from 3 to 4 in the pure fission region below the $(\gamma, n)$ threshold to about 2 at energies just above the $(\gamma, n)$ threshold. In an effort to understand these new data, a model has been developed where the neutrons are emitted isotropically in the center-of-mass frame of the fission fragments. The fission fragment angular distributions are taken from previous $\gamma$-ray and neutron induced fission data and are used to predict the values of $I_{\text{par}}/I_{\text{perp}}$ for both the fission fragments and the neutrons. Experimental results will be shown and compared with the results of these calculations.

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