

Abstract Submitted  
for the DNP10 Meeting of  
The American Physical Society

**Photofission Neutron Yield Ratios on  $^{238}\text{U}$  near  $E_\gamma = 6.2$  MeV  
using Linearly Polarized  $\gamma$  rays<sup>1</sup>**

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 ( $I_{par}/I_{perp}$ ) have been measured using a U-238 target for the first time near the  $(\gamma, n)$  threshold of  $E_\gamma \simeq 6.2$  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  $I_{par}/I_{perp}$  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  $I_{par}/I_{perp}$  for both the fission fragments and the neutrons. Experimental results will be shown and compared with the results of these calculations.

<sup>1</sup>Supported in-part by DOE (DE-FG02-97ER41033), CMMI-NSF/DHS (0938773), DNDO (2008-DN-077-ARI010) and DNDO (LLNL).

Sean Stave  
Duke U/TUNL

Date submitted: 01 Jul 2010

Electronic form version 1.4