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(Gamma,n) Polarization Asymmetry Ratios of 209-Bismuth
DAVID PAYETTE[1], None — There has been an ongoing research program measuring the polarization asymmetries from the (γ, n) reaction on various nuclei using linearly and circularly polarized gamma-ray beams from the High Intensity Gamma Ray Source (HIγS) at Duke University. Experimental results will be shown for (γ, n) polarization asymmetry ratios on ^{209}Bi for neutron energies from $2-7$ MeV, and for angles $55^{\circ}, 90^{\circ}, 125^{\circ}, 72^{\circ}$, and 107°. Measurements were taken using linearly polarized gamma ray beam energies from $11-15.5$ MeV and circularly polarized at 15.5 MeV, and 16 liquid scintillator detectors, half in the plane of polarization, and half perpendicular. Results demonstrate that Giant Dipole Resonance causes isotropic ratios at lower neutron energies (2-4 MeV), and non-isotropic ratios at higher neutron energies (5-7 MeV). This research introduces the possibility of using (γ, n) as a method for identifying materials crossing international borders, by knowing ratios of many different metals.

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