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Photon strength functions from photon scattering

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We present photon-scattering experiments using bremsstrahlung at the γELBE facility of Helmholtz-Zentrum Dresden-Rossendorf (HZDR) and using quasi-monoenergetic, polarized γ rays at the HIγS facility of the Triangle Universities Nuclear Laboratory (TUNL) in Durham. In the analysis of the spectra measured by using bremsstrahlung at γELBE, we include intensity in the quasi-continuum and perform simulations of statistical γ-ray cascades using the code γDEX to estimate intensities of inelastic transitions to low-lying excited states. Simulated average branching ratios are compared with model-independent branching ratios obtained from spectra measured by using monoenergetic γ beams at HIγS. Photoabsorption cross sections deduced in this way are presented for selected nuclides. Strength in the energy region of the so-called pygmy dipole resonance (PDR) is considered in nuclei around mass 80 and in xenon isotopes.

In collaboration with Ralph Massarczyk, Los Alamos National Laboratory.