

# Photon Strength Functions of Medium-Weight and Heavy Nuclei (Mainly from Radiative Neutron Capture Experiments)\*

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Although decay properties of highly excited compound nuclear states have been a subject of continuing experimental and theoretical studies for long time, in many respects they are still far from being satisfactorily understood. This is mainly due to poor experimental knowledge of E1 and M1 photon strength functions (PSFs) at  $\gamma$ -ray energies below about 7 MeV. A large body of information on PSFs at these energies has been recently collected from radiative neutron capture experiments. A clear evidence for some interesting effects in PSFs — the M1 scissors mode of the excited nuclei, the phenomenon known as an E1 pygmy resonance, and recently reported possible strong enhancement of PSFs at low  $\gamma$ -ray energies in Fe and Mo isotopes [1,2] — in data accumulated from radiative neutron capture experiments is presented. Experimental data, that are shown, come from two-step cascade measurements [3] and from large BaF<sub>2</sub>  $\gamma$ -detector arrays installed in Karlsruhe and Los Alamos (DANCE detector).

In addition, a comparison of data from nuclear resonance fluorescence measurements with information on PSFs obtained from (<sup>3</sup>He,<sup>3</sup>He') and (<sup>3</sup>He, $\alpha$ ) reactions indicate that the E1 PSF at energies about 3 MeV does not follow the Brink hypothesis but that it is temperature dependent. This effect is also discussed.

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[1] A. Voinov *et al.*, Phys. Rev. Lett. **93**, 142504 (2004).

[2] M. Guttormsen *et al.*, Phys. Rev. **C 71**, 044307 (2005).

[3] M. Krtička *et al.*, Phys. Rev. Lett. **92**, 172501 (2004).