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Photonuclear Probe of Astrophysics

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Real photons are a good probe of E1 and M1 γ -strength functions of nuclei. In stellar conditions, both neutron capture and photodisintegration are sensitive to the γ - strength function in the low-energy tail of the electric giant dipole resonance (GDR) that are assumed to be built on individual excited states. The γ -strength function is a key ingredient to improve the reliability of the Hauser-Feshbach model description of neutron capture and photodisintegration. Recently precision determination of photoneutron cross sections of astrophysical importance has become possible with use of quasi-monochromatic γ beams from laser Compton backscattering at AIST. These data provide a good insight into the γ -strength function in the low-energy tail of GDR. This talk covers precision measurements of photodisintegration cross sections in the context of the p-process and s-process nucleosyntheses.