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The dipole photon strength of uranium isotopes

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The photon strength functions (PSFs) and nuclear level density (NLD) are vital ingredients for the calculation of the photon interaction with nuclei, in particular, the reaction cross sections via the Hauser-Feshbach approach \1. These cross sections are important, especially in nuclear astrophysics \[2,3] and in the development of advanced nuclear technologies \[4,5].

The role of the scissors mode in the *M1* PSF of well-deformed actinides was investigated by several experimental techniques, see e.g. Refs. \[6,7]. The analyses of these experiments show significant differences, especially on the strength of the mode. The shape of the low-energy tail of the giant electric dipole resonance is uncertain as well. In particular, some works proposed a presence of the *E1* pygmy resonance just above 7 MeV. Because of these inconsistencies, additional information on PSFs in this region is of great interest.

The γ-ray spectra from neutron-capture reactions on the ^{233}U, ^{234}U, ^{236}U, and ^{238}U nuclei have been measured with the total absorption calorimeter of the n_TOF facility at CERN \8. The background-corrected sum-energy and multi-step-cascade spectra were extracted for several isolated *s*-wave resonances.

The experimental coincident γ-ray spectra were compared with their simulated counterparts using Monte-Carlo code DICEBOX \9. This approach allowed us to test different models of NLD and PSFs. Our results for odd compound nuclei were published in Ref. \10. I want to highlight the main results from this study and show the first results from the capture on ^{233}U. The integrated strength of the scissors mode was found to be significantly higher compared to values in Refs. \[6,7]. The comparison of PSFs shall be discussed in detail.

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