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**DIFFERENTIAL CROSS SECTIONS OF GAMMA-RAY EMISSION  
IN THE INTERACTIONS OF FAST NEUTRONS WITH CADMIUM**

Experimental measurements of the  $\gamma$ -ray spectrum in  $(n, x\gamma)$  reactions induced by the interaction of fast neutrons with Cadmium nuclei were performed using time-of-flight technique. Differential cross sections of  $\gamma$ -ray emission in  $^{nat}\text{Cd}(n, x\gamma)$  reactions were unfolded from amplitude instrumental spectrum using algorithm on the compact set of limited variations. Cross section uncertainties are estimated. Measurement results are compared with theoretical calculations performed, assuming gamma-emission from compound nucleus as well as pre-equilibrium emission. Dependence of calculated cross sections on the parameters of optical potential, nuclear level densities and radiative strength functions is considered.

*Keywords:* neutron induced reactions, time-of-flight method, gamma-spectrum, Hauser - Feshbach statistical model, optical potential, radiative strength function, nuclear level densities.