

SEMIDIRECT CAPTURE MODEL AND THE ANGULAR DISTRIBUTION OF γ -RAYS
FROM THE RADIATIVE CAPTURE OF FAST NEUTRONS

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Angular distribution of γ -rays from the radiative capture of neutrons in the region of giant dipole resonance has not yet been measured. For the moment being it can be only roughly guessed from the comparison of spectra measured at 90° relative to the neutron beam ¹⁾ to that integrated over solid angle of 4π for light nuclei and over 2π for heavier ones ²⁾.

A considerable difference between the two spectra in $^{88}\text{Sr}(n, \gamma)^{89}\text{Sr}$ reaction, indicating rather strong anisotropy, stimulated us to refine the semidirect capture model and calculate the angular distribution of capture γ -rays. In the angular distribution of the shape $A(1 + B P_2(\cos \nu))$ the values of the coefficients B , calculated within the limits of the Clement, Lane and Rook approach to the semidirect capture model are: - 0.88, -1, - 0.83, - 0.36 and - 0.19 for transitions to the $d_{5/2}$, $s_{1/2}$, $d_{3/2}$, $g_{7/2}$ and $h_{11/2}$ respectively. The values for the calculated ratio between the spectral intensity at 90° relative to the neutron beam and that, averaged over solid angle of 4π in general do not agree with those following from the Fig.1.

References

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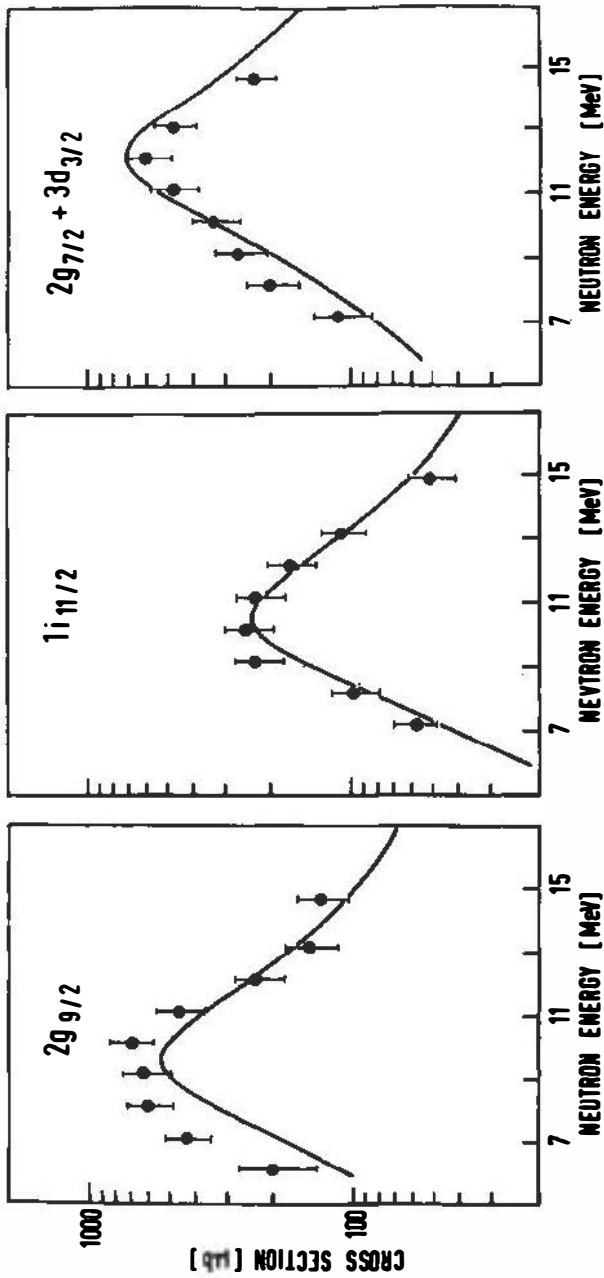


Fig. 1 Comparison of the experimental excitation functions for capture of neutrons into different final states of Pb^{209} (ref-3) with the results of the semidirect capture model calculations 6).