

Analytical approach to the generation of angular momentum in spontaneous fission fragments

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Recently, a large set of experimental data on angular momenta of fission fragments has been obtained [1]. This includes the absence of correlations between angular momenta of fission fragments, as well as the sawtooth dependence of fragment angular momentum on its mass. To investigate these phenomena, we propose a model describing the generation of angular momentum of fission fragments as due to the angular vibrations in scission configuration. It is assumed that, after tunneling through the fission barrier, the nucleus can be represented by superposition of dinuclear systems (DNS) [2]. The angular motion in the DNS is treated quantum-mechanically [3], yielding the angular momentum distribution of DNS nuclei at scission configurations. An analytical expression for distribution of angular momenta of fission fragments is obtained. The main experimental phenomena are explained.

References

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