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Investigation of shape coexistence in 96Zr and 96Mo within the framework of one-dimensional geometric collective model

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The coexistence of forms is an interesting phenomenon that can occur in many nuclei. At the moment, there are experimental data that indicate the coexistence of spherical and deformed shapes in ^{96}Zr and ^{96}Mo. In this work, the observed properties of low-lying collective excitations ^{96}Zr and ^{96}Mo are investigated within the framework of the geometric collective nuclear model without taking into account the nonaxial degree of freedom with the Bohr Hamiltonian, the potential energy of which has two minima - spherical and deformed. The potential energy was selected in such a way as to describe the experimental data on the excitation energies 0_1^+, 0_2^+, 2_1^+, 2_2^+ and states and probabilities E2 of the transitions B(E2; $2_1^+ \to 0_1^+$), B(E2; $2_2^+ \to 0_2^+$) and B(E2; $2_2^+ \to 0_1^+$). A satisfactory description of the excitation energies and transition probabilities is obtained. It is shown that in the case of ^{96}Zr, both minima are rather deep, while in the case of ^{96}Mo, the deformed minimum is only outlined.

Primary authors: MARDYBAN, Mariia; Dr KOLGANOVA, Elena; JOLOS, Rostislav; Dr SHNEIDMAN, Timur; Mr SAZONOV, Dmitriy

Presenter: MARDYBAN, Mariia

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