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Description of the spectra of the lowest states for a chain of Zr isotopes based on the geometric collective model

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The work is devoted to the description of the spectra of the lowest states and transition probabilities for the chain of zirconium isotopes $^{92-102}$Zr in the framework of the geometric collective model. As the mass increases, these isotopes undergo a transition from the spherical structure of the ground state to the deformed one; in ^{96}Zr, the coexistence of spherical and deformed states is observed. The consideration is based on the collective Bohr quadrupole Hamiltonian, taking into account the triaxial degree of freedom. The selection of the potential parameters for each nucleus was carried out in such a way as to minimize the standard deviation between the available experimental data and the calculated values. The obtained potentials are close in shape to the potentials of the mean field models. Fairly good agreement with experimental data is observed. The deviations of the calculated data for isotopes with a spherical shape are analyzed.

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