

Shape coexistence and mixing within the Bohr model

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The Bohr Hamiltonian [1,2] with a sextic potential, having two minima, a spherical and a deformed one separated by a barrier, was diagonalized in a basis of Bessel functions of the first kind [3]. The model, depending on the height of the potential barrier (Panels 1-4 of Figure 1 from [4]), can describe the well-known critical points from spherical vibrator to prolate / γ -unstable rotor if the barrier is very small / absent, a shape evolution as a function of the total angular momentum, respectively the shape coexistence and mixing phenomena once the barrier is gradually raised. Some preliminary applications of the model for ^{76}Kr [4], $^{72,74,76}\text{Se}$ [5], $^{96,98,100}\text{Mo}$ [6], ^{74}Ge , ^{74}Kr [7] and ^{80}Ge [8] revealed promising perspectives for future applications of the model to other nuclei known to manifest these phenomena.

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