

COHERENT SHAPE PHASE MIXING IN TRANSITIONAL NUCLEI

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Spectral properties of nuclei near the critical point of the phase transition between spherical and axially symmetric shapes are studied within a hybrid approach which combines the gamma-stable and gamma-rigid collective conditions through a rigidity parameter. Using various beta potentials, one can achieve a coupling between distinct X(5) and X(3) related solutions. The transition from a three-dimensional to a five-dimensional shape phase space is discussed in connection to a corresponding Euclidean symmetry. Numerical applications of the model on nuclei adjacent to already known critical regions of the nuclide chart reveal a sizable shape phase mixing which enables a better description of their energy spectrum and electromagnetic transitions.