Two Quasiparticle Rotor Model for Deformed Nuclei

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Abstract : The study of level structures of deformed nuclei is the most complex topic in nuclear physics. For the description of level structure, a simple model is good enough to bring out the basic features which may then be further refined. The low lying level structures of these nuclei can, therefore, be understood in terms of Two Quasiparticle plus axially symmetric Rotor Model (TQPRM). The formulation of TQPRM for deformed nuclei has been presented. The analysis of available experimental data on two quasiparticle rotational bands of deformed nuclei present unusual features like signature dependence, odd-even staggering, signature inversion and signature reversal in two quasiparticle rotational bands of deformed nuclei. These signature effects are well discussed within the framework of TQPRM. The model is well efficient in reproducing the large odd-even staggering and anomalous features observed in even-even and odd-odd deformed nuclei. The effect of particle-particle and the Coriolis coupling is well established from the model. Detailed description of the model with implications to deformed nuclei is presented in the paper.

Keywords : deformed nuclei, signature effects, signature inversion, signature reversal

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