

Energies and Transition Probabilities in Nuclear Alternating-parity Spectra

N. Minkov¹, S. Drenska¹, M. Strecker², W. Scheid²

¹Institute of Nuclear Research and Nuclear Energy,
Bulgarian Academy of Sciences, Tzarigrad Road 72,
BG-1784 Sofia, Bulgaria

²Institut für Theoretische Physik, Justus-Liebig-Universität,
Heinrich-Buff-Ring 16, D-35392 Giessen, Germany

An extension of the model of coherent quadrupole-octupole vibrations and rotations [1] is presented which describes energies and transition rates in the yrast and non-yrast alternating-parity spectra of even-even nuclei. Generalized electric transition operators reflecting the complex shape properties associated with the quadrupole-octupole vibration mode are introduced. Model expressions for the B(E1), B(E2) and B(E3) reduced transition probabilities within and between the different energy sequences are derived. It is shown that the model successfully reproduces the yrast and non-yrast alternating-parity levels together with the related B(E1)-B(E3) transition rates in several rare-earth and actinide nuclei.

References

- [1] N. Minkov, P. Yotov, S. Drenska, W. Scheid, D. Bonatsos, D. Lenis and D. Petrellis, *Phys. Rev. C*, **73**, (2006) 044315.