Simultaneous Description of Positive and Negative Parity Bands in Even-Even and Even-Odd Nuclei

A. A. Raduta[a,b] and C. M. Raduta [a]

[a] Department of Theoretical Physics, IFIN-HH, Bucharest, POBox MG6, Romania
[b]Academy of Romanian Scientists, 54 Splaiul Independentei, Bucharest 050094, Romania

Abstract

A unified description of four positive and four negative parity rotational bands for even-even nuclei with and without octupole deformation is presented within an extended version of the coherent state model. Signatures for octupole deformation in the ground as well as in the excited bands are pointed out. Specific features of octupole deformed nuclei related with the electric and magnetic transition probabilities are presented. The second part of this lecture regards the parity partner bands in even-odd nuclei. Comments about a possible chiral symmetry to be detected in odd nuclear systems are added. To save the space, only a part of the applications performed in the last decade were reviewed.

PACS numbers: 21.10.Re,21.60.Ev,27.80.+w,27.90.+b

Keywords: parity, space reflection symmetry, static octupole deformation, nuclear phase, transition probabilities, quadrupole and octupole bosons.