Algebraic IBM-ST and mean-field DSM-T models for N=Z nuclei

V.K.B. Kota
Physical Research Laboratory, Ahmedabad 380 009

Spin-isospin invariant interacting boson model (IBM-ST) with group symmetries U(6) $\otimes$ U(6) and SO(36) $\supset$ SO(6) $\oplus$ SO(30), is being used for predicting some general properties of heavy N=Z nuclei and these include even-even to odd-odd staggering in the number of T=0 pairs in the ground states, deuteron transfer intensities and in odd-odd nuclei B(E2)'s in the ground T=1 band. Also IBM-ST reduces, in an appropriate limit, to the fermionic SO(8) proton-neutron pairing model of the shell model. On the other hand, the mean-field deformed shell model with isospin projection (DSM-T) has been developed and it is being used, with realistic effective interactions, for predicting detailed properties of the levels in the low-lying T=1 and T=0 bands in odd-odd N=Z nuclei and also various bands in N=Z even-even and N=Z+1 odd-A nuclei. Besides describing IBM-ST and DSM-T, in the talk we will present some results of these models for N=Z nuclei in A ~ 60-100 region. Finally, the issues involved in expanding the scope of these models will be discussed.

Invited talk in the workshop on "Frontiers in Gamma ray Spectroscopy" (FIG09) to be held at Tata Institute of Fundamental Research, Mumbai, India, from 2nd - 4th March 2009.