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COMPARISON OF INTERACTING BOSON-FERMION MODEL WITH SPIN-DEPENDENT GENERALIZED COLLECTIVE MODEL FOR THE J=3/2

Baktybaev K.[1], Koilyk N.[1], Ramankulov K.[2]
[1]*National University, Almaty, Kazakhstan*
[2]*National Pedagogical University, Almaty, Kazakhstan*

Collective Schrödinger equations are applied to describe low-energy spectra of even-even nuclei [1]. Spectra for even-odd nuclei are calculated by coupling the single particle degrees of freedom to the collective degree of freedom of the core nucleus, which is of even-even type. The collective spin has a value of 3/2. This leads to the assumption that the linearized equation may be applied to describe nuclei with spin 3/2 in the ground state. Good description of the low energy spectra and electromagnetic transition probabilities can be obtained only with introduction of spin-dependent potentials, which apart from coordinates and momenta also depend on the matrices of the Clifford algebra arising in the linearization,.

The interacting boson-fermion models (IBFM) [2] represent another approach to describe spectra of even-odd nuclei. For even-odd nuclei with spin 3/2 in the ground state one uses so-called j=3/2 - IBFM, which is also denoted as the $U_B(6) \times U_F(4)$ IBFM.

In this paper we establish the relation between the matrices of the Clifford algebra, which arise in the linearization procedure, and the fermion operators of the j=3/2 IBFM. This allows us to establish a connection between the j=3/2 IBFM and spin dependent generalized collective model (SGCM). The results of the SGCM for Ir and Au nuclei are presented and compared with the results of the j=3/2 IBFM with a dynamical spin symmetry [3] present. In this respect we could apply the linearized collective Schrödinger equation and IBFM with arbitrary spin to all other even-odd nuclei.

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