THE STRUCTURE OF SOME MIRROR LIGHT NUCLEI, STUDIED WITH THE GENERATOR COORDINATE METHOD

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The structure of the mirror nuclei ^{19}Fe, ^{21}Na, ^{23}Mg, ^{19}F, ^{21}Ne and ^{23}Na are studied by comparing the energy spectra and the electromagnetic properties of the corresponding excited states. The electromagnetic properties are calculated with the generator coordinate method and compared with experimental data and with the results of complete diagonalization. The classification of states is made by means of the simple adiabatic rotational model. The nuclei ^{19}F and ^{19}Ne have rather well pronounced rotational band with $K^{\pi} = 1/2^{+}$, while for ^{21}Ne, ^{21}Na, ^{23}Na and ^{23}Mg three bands with $K^{\pi} = 1/2^{+}$, $3/2^{+}$ and $5/2^{+}$ can be noticed. The absolute values of the electric quadrupole moments are from 50 efm^2 - 60 efm^2 and increase smoothly with A.The similarities between the magnetic properties of the corresponding nuclear states of different nuclei can be roughly understood from the fact that nuclei concerned have the same or different odd number of protons (neutrons), whereas the numbers of neutrons (protons) are even.

Reference:

N.Mankoč-Borštnik, F.Brut and S.Jang, to be published in Nucl. Physics