Relation between Parity Shift Effects in the Spectra of Neighboring Even-Even and Odd-Mass Octupole Deformed Nuclei

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A systematic comparison between experimental spectra of neighboring odd-mass and even-even nuclei with octupole deformation has been done. As a result a difference in the angular momentum dependence of the parity shift in alternating-parity bands of even-even nuclei and of the parity-doublet splitting in odd-A nuclei was found. In even-even nuclei the parity shift is initially large and always decreases with the angular momentum. In odd-mass nuclei the parity-doublet splitting does not exhibit such uniform behavior, but shows several possible dependencies, namely continuous decrease, increase and decrease with subsequent increase. Also, it was found that the angular momentum dependence of the levels with given parity in the spectrum of an odd-mass nucleus is similar to the respective behavior of the levels with opposite parity in the spectra of the neighboring even-even nuclei. This finding gives an idea for possible explanation of the various dependencies of the parity-doublet splitting in odd-A nuclei.