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Hexadecapole deformed configurations in nuclei at high excitation energies

The hexadecapole deformation, as well as the quadrupole one, influences the low-lying states of finite nuclei. The hexadecapole correlations are often overshadowed by the large quadrupole effects, and hence have not been much investigated. We have investigated hexadecapole (Q_4) deformed configurations in microscopic calculations involving the deformed Hartree-Fock theory [1]. $K = 0$ configurations are investigated in even-even nuclei. Physical states of good angular momentum are obtained by Peierls-Yoccoz angular momentum projection technique from intrinsic configurations [2]. These Q_4 deformed bands have large $E4$ transition rates, and $E2$ transitions are rather low. Such bands (along with the ground and low excitation bands) and their spectra, as well as transition rates have been obtained by us in the Zr regions in the Sn region and the rare-earths. These Q_4 deformed bands, calculated by us in Sn, Zr and the rare-earth nuclei, occur about 20 MeV above ground states and have very strong $E4$ intra-band matrix elements. The characteristic of low intra-band E2 rates for the Q_4 bands can help identify such bands at high excitation energies. The detailed results will be discussed during the conference.

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