Frontiers in Gamma Ray Spectroscopy FIG18

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Multiquasiparticle high K bands: Possibilities for Gamma-ray Spectroscopy

Content :

We have studied theoretically, using deformed Hartree-Fock and angular momentum projection, the structures and spectra of excited large K configurations of multi-quasi-particle nature (upto 8 quasi-particle) for heavy Hafnium nuclei. Not much is known experimentally about such multiquasi-particle configurations and their band structures. We have theoretical results for the spectra and E2 and M1 matrix elements of such excited bands. For 170Hf, e.g. we have K= 18-, 20- six quasi-particle bands and K=26+ eight quasi-particle band. The later band-head is yrast at excitation energy of 7.3 MeV. We have a 10 quasi-particle high K band with K=32- of band-head energy 10.7 MeV which is also yrast. So we have several large K yrast configurations extending to J above 50ħ. The E2 and M1 properties of these bands are also studied. The spectroscopy of such bands, their electromagnetic properties and decay modes need to be studied experimentally.

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