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Triaxiality and shape coexistence as basic modes of collective bands of heavy nuclei

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Many of deformed heavy nuclei, such as ^{166}Er and their neighbors in the nuclear chart, are shown to have triaxial ground and gamma bands with gamma equal to about 10 degrees, with gamma stretching in the gamma bands.

Some other nuclei, like ^{154}Sm , show prolate ground bands, but their side bands are produced by the shape coexistence of triaxial shapes with gamma equal to about 15 degrees.

Monopole interactions containing tensor force contributions are essential for these structures. If time permits, M1 excitations from these ground states may be discussed, with a possible mode specific to triaxial ground states.

The calculated results are obtained by the advanced version of the Monte Carlo Shell Model (MCSM), called the Quasiparticle Vacuum shell model.

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