IDENTIFICATION OF CHIRAL PAIRS IN MULTIPLE CHIRAL BANDS ASSOCIATED WITH THE SAME NUCLEON CONFIGURATION

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A nuclear chiral system is formed when the total angular momentum of the nucleus is aplanar, i.e. when it has significant projections along all three nuclear axes [1]. Most important for the identification of chiral bands is to establish a pair of $\Delta I = 1$ bands that are near-degenerate in energy, but also in B(M1) and B(E2) transition probabilities [1]. Up to date, chiral candidates showing two- or multi-quasiparticle partner bands have been observed in several nuclei in A ~ 80, 100, 130 and 190 mass regions. The existence of multiple chiral partner bands (MχD) with large triaxial deformation, but with different particle-hole configuration was proposed in a single nucleus [2]. The MχD was firstly experimentally confirmed in ^{133}Ce [3].

Contrary to MχD that differ from each other in their particle-hole configurations and may correspond to different triaxial deformations, we investigated the existence of multiple chiral bands built on the same nucleon configuration. Our calculations using the two-quasparticle-plus-triaxial-rotor (TQPRM) [4] and multi-particle-plus-triaxial-rotor (MPR) [5] models, confirm that more than one pair of chiral bands may exist in a nucleus with the same nucleon configuration [6]. Multiple chiral systems were found in the 100, 130 and 190 mass regions, but they may not necessarily form well defined pairs of near-degenerate bands. The present work studies how one can identify or group chiral pairs in multiple chiral bands associated with the same nucleon configuration. The results from these calculations will be presented and discussed.

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