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Dipole excitations in ^{162}Er - ^{166}Yb

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Particle-hole symmetry reveal some degenerate experimental observable for nuclei having equal N_pN_n. Up to date, $E(2^+)$, E_{4+}/E_{2+}, $B(E2; 2^+ \rightarrow 0^+)$, spectroscopic factors for alpha decay, binding energy and moment of inertia have been investigated as a function of N_pN_n[1]. Recently, it has been shown that nuclei having particle-hole symmetry reveal similar excitation patterns up to 10^+ in yrast bands. ^{162}Er and ^{166}Yb nuclei having particle hole symmetry show similar excitation patterns in the yrast, γ and β bands. In the present work, we are aiming to investigate the dipole excitation modes in ^{162}Er and ^{166}Yb. These features have not been investigated within this perspective so far. We investigate the dipole structure properties of the deformed of these nuclei in the dipole resonance energy region within the framework of the quasiparticle random-phase approximation (QRPA), which is one of the models taking account the quasiparticle and pairing interactions[2-6]. Due to the mean field features of the QRPA, spontaneous broken of the translational and Galilean symmetries of the single particle Hamiltonian are observed. In this context, we also aim to investigate the effects of both translation and Galilean (TGI) restorations invariance QRPA on the dipole properties of ^{162}Er and ^{166}Yb whether they reveal a similar behaviour or not as in the low-lying excitation modes.

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