A particle-number conserving description of rotational correlated states

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Abstract: The so-called Higher Tamm-Dancoff Approximation (HTDA) has been designed to describe microscopically correlations within a particle number conserving approach. It relies upon a truncated n particle-. n hole expansion of the nuclear wavefunction, where the single particle basis is optimized self-consistently by using the Skyrme mean field associated with the single-particle density matrix of the correlated wavefunction. It is applied here for the first time in a rotating frame, i.e. within a self-consistent cranking approach (cranked HTDA or CHTDA) aimed at describing the collective rotational motion in well-deformed nuclei. Moments of inertia predicted by cranked HTDA in the Yrast superdeformed (SD) bands of some A≈190 nuclei are compared with those deduced from experimental SD sequences as well as those produced by current cranked Hartree-Fock-Bogoliubov approaches under similar hypotheses. © 2010.
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