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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