

# ***Pairing correlation and mass parameters in even-even nuclei within the Higher Tamm-Dancoff Approximation (HTDA) approach***

**M. Imadalou<sup>1</sup>, D. E. Medjadi<sup>1</sup>, L. Prochniak<sup>2</sup>  
& Ph. Quentin<sup>3</sup>**

<sup>1</sup> Ecole Normale Supérieure, Kouba, Alger

<sup>2</sup> Maria Curie-Skłodowska University, Lublin

<sup>3</sup> CEN Bordeaux-Gradignan

*The present study proposes to treat in first, the pairing correlations by the Higher Tamm-Dancoff Approximation (HTDA) approach in the case of braking axial symmetry in the even-even nuclei. Then, starting from the obtained HTDA solutions, we will calculate the potential, the mass parameters and the moments of inertia occurring in the general Bohr Hamiltonian to determine the collective spectra of the studied nuclei. The HTDA approach uses the most powerful phenomenological nucleon-nucleon effective interactions of the Skyrme SIII type. It corresponds to high truncated shell model type calculation using self-consistent one-body states. It is possible to evaluate in a reliable and numerically feasible way the pairing correlations in a formalism preserving explicitly the particle number.*

***Keywords:*** HTDA, Mass parameters, Moments of inertia