Collective Motion in Triaxial Nuclei System under a Minimal Length Concept

M. Chabab, **A. El Batoul**, **A. Lahbas**, **M. Oulne**

High Energy Physics and Astrophysics Laboratory, Faculty of Sciences Semlalia, Cadi Ayyad University, P. O. B. 2390, Marrakesh 40000, Morocco

The concept of minimal length, inspired from Heisenberg algebra, is applied to the geometrical collective Bohr- Mottelson model (BMM) of nuclei. Under the deformed canonical commutation relation and the Pauli-Podolsky prescription, we have derived the quantized Hamiltonian operator for triaxial nuclei system like an axial prolate γ-rigid **(M. Chabab et al., Phys. Lett. B 758 (2016) 212218)**. By considering an infinite square well like potential in β collective shape variable, the eigenvalues of the Hamiltonian are obtained in terms of zeros of Bessel functions of irrational order with an explicit dependence on the minimal length parameter. Moreover, the associated symmetry with the model that we have constructed here can be considered as a new dynamical critical point symmetries (CPSs) in nuclear structure. The theoretical result indicates a dramatic contribution (Low effect) of the minimal length to energy levels (ground state band) as well as the β-band for lower values of the angular momentum and regular (significant effect) for higher value ones. In fact that, these features reflect that the minimal length scenario is helpful in recognizing the properties of real deformed nuclei having high spins or strong rotations. Finally, numerical calculations are performed for some nuclei revealing a qualitative agreement with the experimental data.