

Abstract ID : 67

Discrete Non-Orthogonal Shell Model: from mid-mass to heavy deformed nuclei

Content

We present an extension of the Discrete Non-Orthogonal Shell Model [1] within a variation after projection approach [2,3] recently developed at IPHC, Strasbourg. This method is an alternative to the exact shell-model diagonalization [4] using non-orthogonal many-body expansions combined with symmetry restoration techniques [5]. We discuss the prospective of the new method for applications from mid-mass nuclei in the Islands of Inversion at $N = 40$ and $N = 50$ to superheavy nuclei. We also discuss a possible way to analyze the interplay between deformation and pairing correlations in the microscopic shell-model wave functions.

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Status: SUBMITTED

Submitted by **DAO, Duy-Duc** on **Wednesday, 19 March 2025**