

## Microscopic version of the Bohr-Mottelson model and its application

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### Abstract

The shell model coupling scheme of the fully microscopic proton-neutron symplectic model (PNSM) [1, 2], defined by the following dynamical symmetry chain  $Sp(12, R) \supset SU(1, 1) \otimes SO(6) \supset U(1) \otimes SU_{pn}(3) \otimes SO(2) \supset SO(3)$ , is considered. It is shown [3] that it corresponds to a microscopic version of the Bohr-Mottelson collective model which captures the original relationships between its exactly solvable submodel limits. This variant of the PNSM provides an interesting and relevant shell-model symplectic-based framework for exploring the nuclear collective dynamics. Some simple applications of the present theory to different nuclei with various collective properties are given.

### References

- [1] H. G. Ganev, Eur. Phys. J. A **50**, 183 (2014).
- [2] H. G. Ganev, Eur. Phys. J. A **51**, 84 (2015).
- [3] H. G. Ganev, Eur. Phys. J. A **57**, 181 (2021).