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The nuclear shell model in the intrinsic frame

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Nuclear shell model (NSM) and variational mean-field approximations and their beyond-mean-field extensions are the two main workhorses in the calculation of nuclear structure observables. In the last few years, thanks to the availability of methods like Monte Carlo Shell Model (MCSM) or the projected generator coordinate method (PGCM) and its multiple variants, NSM individual states can be interpreted in terms of collective coordinates defined in the intrinsic frame (e.g., multipole deformations). On the other hand, the evaluation of occupation numbers of self-consistent spherical orbits within the PGCM framework also allows for a NSM-like interpretation of the nuclear states provided by this method. These theoretical developments are very useful to, e.g., fully understand collective phenomena like shape-evolution, shape-mixing and shape-coexistence, as well as the appearance/degradation of magic numbers. In this contribution I will show some examples of how these two (in principle) different approaches are actually two sides of the same coin.

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