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SÉMINAIRE

Mean-field studies of rare earth nuclei within Skyrme energy-density functional

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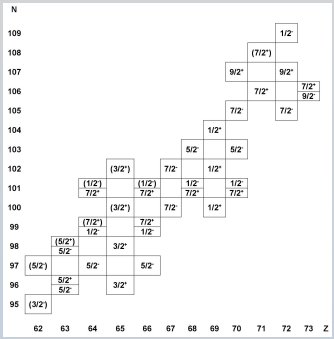
salle des séminaires du CENBG

Vendredi 21 juin 2019 à 11h15

café servi à partir de 11h

In this talk, I will first introduce the mean-field theory and the resulting energy-density-functional (EDF) when the Skyrme interaction is used to approximate the effective nucleon-nucleon interaction. Following that, my talk will delve into the current standpoint in the studies of rare-earth nuclei. The main theme of the work is the inclusion of the time-reversal symmetry breaking effect (at the mean-field level) in calculations of odd-mass nuclei which arises due to the unpaired nucleon. This symmetry breaking is also considered when fitting the strengths of pairing interaction entering the Bardeen-Cooper-Schrieffer model based on the odd-even mass differences. After enumerating on the details of the calculations, I will present comparison between calculated results and experimental data for some ground-state properties of odd-mass nuclei. The second part of my talk will be devoted to another aspect; pertaining to the inclusion of nuclear tensor term within the Skyrme EDF. I will first present a benchmark study to reproduce earlier calculations of the single-particle spin-orbit splitting when nuclear tensor is included perturbatively to an existing Skyrme parametrization. Thereafter, I will discuss preliminary results on the impact of nuclear tensor term on properties of even-even nuclei.



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