Université Paris-Saclay
IJCLab
(Laboratoire de Physique des 2 Infinis Irène Joliot-Curie)
Bât. 100, F-91405 Orsay

Séminaire de Physique Nucléaire Théorique

Bubble nuclei and finite-size instabilities in mean-field calculations.

Karim Bennaceur
(Université de Lyon, Institut de Physique Nucléaire de Lyon)

Finite-size instabilities are unphysical phase transitions that plague several parameterizations of effective interactions used in self-constistent mean-field calculations. They take the form of large-amplitude oscillations of the isovector density, or the vector (spin) density if time reversal symmetry in not enforced. I will briefly review a study we made concerning the isovector instabilities and discuss a quantitative tool that we have developed in order to detect and avoid them during the fit of the parameters of an interaction. Since the so called bubble (or semi-bubble) nuclei show significant oscillations in proton and neutron densities often quantified by a depletion factor, it is interesting to see how the proximity of an isovector instability may be correlated with this depletion factor. Finally, I will revisit some results for several nuclei considered as having a possible bubble structure and question the predictive power of the zero or finite-range interactions used for these predictions.

Jeudi 21 Mars 2019
11 :30
IJCLab, Bât. 100, Salle Bâtiment 100, Salle A201