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Séminaire de Physique Nucléaire Théorique

How to visualize nuclear many-body correlations ?

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A method to visualize many-body correlations using the information of the full wave function is presented [1]. The set of nucleon coordinates which maximizes the square of the wave function, that is, the most probable spatial configuration of nucleons, is visualized. The method is applied to Hartree-Fock (HF) and HF+BCS wave functions of p- and sd-shell nuclei to analyze the many-body correlations in those systems. It is found that there are alpha-cluster-like four-body correlations already at the HF level in some of the nuclei. The effects of pairing on the most probable configuration are also investigated. The method is useful to analyze the nuclear many-body correlations, and it suggests a new viewpoint to microscopic nuclear wave functions.

Mardi 30 Mai 2023
13 :30
IJCLab, Bât. 100, Salle Salle A018 (IJCLab)