

— 第920回九大原子核セミナー —

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演題：Clustering and response functions of light nuclei in explicitly correlated Gaussians

日時：10月22日(水) 16:30～

† 今回は通常と曜日・場所が異なりますのでご注意ください

場所：理学部 物理 第一会議室 (理学部2号館1階2154室)

概要

Explicitly correlated Gaussian basis has been used for solving few-body problems in many fields. The basis functions are easily adaptable and flexible enough to describe complex few-body dynamics. We obtain a unified description of different types of structure and a fair account of correlated motion of interacting particles as well as the tail of the wave function.

I present some examples that show the power of the correlated Gaussians: The bound and resonant states of ^4He , the electric dipole response functions of ^4He and ^6He , and α -clustering in ^{16}O in the framework of a ^{12}C core plus four nucleon model. The case of ^4He is an ab initio type study using a realistic interaction, while the cases of ^6He and ^{16}O are based on effective interactions with emphasis on a detailed account of the underlying dynamics.

It is a challenge for future to extend the application of the correlated Gaussians to a study on a competition between single-particle motion and clustering around a non-inert core. Such a study will be important to evaluate the rate of the radiative capture reactions $^{12}\text{C}(\alpha, \gamma)^{16}\text{O}$ at low energy and to account for the low-lying spectrum of ^{212}Po that shows the large α -decay width and the enhanced electric dipole transitions.

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