

— 第923回九大原子核セミナー —

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演題： The Lagrange-mesh method

日時： 2月2日(月) 16:30～

† 今回は通常と曜日が異なりますのでご注意ください

場所： 理学部 物理大学院講義室 (理学部2号館2階2263室)

概要

The Lagrange-mesh method has the simplicity of a calculation on a grid and can have a high accuracy in a variety of quantum-mechanical problems with fast calculations. It is an approximate variational method taking the form of algebraic equations on a grid thanks to the use of a Gauss-quadrature approximation. The variational basis related to this Gauss quadrature is composed of infinitely differentiable functions vanishing at all mesh points but one. The accuracy may however be destroyed by singularities of the potential term. This difficulty can often be overcome by a regularization which does not affect the simplicity and accuracy of the method.

The principles of the Lagrange-mesh method are described, as well as some examples of meshes and their regularization. Recent applications will be presented: the polarizabilities of the hydrogen atom with numerically exact solutions of the Dirac equation, the antiprotonic helium atom, the helium atom confined in an impenetrable sphere, the combination with the R matrix method in the continuum-discretized coupled-channel (CDCC) approach.

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平成 27 年 1 月 17 日