

Gaussian Expansion method and its application to the ground and the first excited states in Atomic physics/ガウス関数展開法と原子分野における基底状 態および第 1 励起状態の推定

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Many important problem in physics can be attributed to solving accurately Schroedinger equation for 3- and 4-body problem. By solving the equation, i) we can predict various observable before measurement, and ii) we can obtain new understandings by comparing the observed data and our theoretical prediction. For this purpose, it is necessary 1) to develop the method to calculate 3- and 4-body problems precisely, and 2) to apply to various fields such as nuclear physics as well as atomic physics.

I have been developing 'Gaussian Expansion Method (GEM)' which is one of few-body calculation method. Here, I explain GEM simply and its application 4He atomic systems.

Indeed, it is interesting to find 'universality' in 4He bosonic systems with large scattering length of 4He-4He potential. In this talk, I show the universality for the binding energies of the ground and the first excited states in three- to five- 4He atomic systems.

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