乞掲示

理化学研究所原子核グループコロキウム　*2004. 1. 21*

講師 ： **Associate Prof. Ryoichi Seki**

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題目 ： Thermal properties of simple nucleon matter on a lattice

∗ The seminar will be given in *Japanese.*

日時 ： 2004年 1月 21日 (Wed.)　14:30 –

場所 ： RIKEN Main Bldg. 1F Seminar Room

Abstract

Thermal properties of nucleon matter is investigated by placing the nucleons on a cubic lattice. The nucleons are hopping from site to site, interacting through a spin-dependent on-site and next-neighbor force. The interaction can be determined from nucleon-nucleon scattering data by an application of the effective field theories, through Luescher's method. The thermal many-body problem is cast in a path integral formulation, and thermal properties are determined numerically by computing the partition function through Monte Carlo integrations. The problem is thus solved in the lattice frame work with no approximation other than numerical. An exploratory numerical work will be shown of nuclear matter in the 4x4x4 space. The lattice formulation of the many-body problem is also amenable to various approaches, as similarly done in condensed matter physics and lattice QCD. As a simple example, a single-species nucleon matter with a simple interaction is treated as an extended, attractive Hubbard model as a model of low-density neutron matter, by applying the Hartree-Fock Bogoliubov approximation. Prospects of application of the renormalization methods will be also discussed.

∗ Host researcher : A. Kohama (RIKEN)

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