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Contribution ID: **4013** Type: **Poster Competition (Graduate Student) / Compétition affiches (Étudiant(e) 2e ou 3e cycle)**

(G*) (POS-19) A Quantum Monte Carlo Study: From the Hubbard model to the Unitary Gas

Tuesday 20 June 2023 17:30 (2 minutes)

The physics of strongly interacting fermionic systems is an interesting topic in nuclear physics. The Hubbard model is one of the simplest yet insightful models that we use to study the strongly interacting fermions. We perform benchmark calculations of ground state energies for the repulsive and attractive Hubbard model using the Auxilary Field Quantum Monte Carlo method, and further tune the model to study the universal properties at the unitary limit. Evidence from ultracold atom experiments is another source that provides feedback to understand the strongly interacting fermion systems that are physically present on Earth. One of our key goals is to map the lattice model to correctly describe the properties of ultracold atoms at the thermodynamic limit so that we can predict the physics of neutron matter such as (extraterrestrial) neutron stars.

Keyword-1

AFQMC

Keyword-2

Hubbard model

Keyword-3

Unitary Fermi Gas

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