Contribution ID: **68** Type: **Talk**

Three-nucleon force effects in nucleon-deuteron scattering at backward angles

Friday 6 September 2019 14:30 (20 minutes)

The necessity of three-nucleon potentials (3NPs) in the nuclear Hamiltonian in addition to two-nucleon potentials (2NPs) is well recognized. A 3NP based on two-pion exchange process among three nucleons (2piE) is often used in few-nucleon calculations, where its strong attractive effect is suppressed by a form factor with a low value of the cutoff mass parameter (about 700 MeV).
In spite of various successful 2piE-3NP effects on 3N observables, there are still unsolved discrepancies between experimental data and calculations. A typical example is the differential cross sections at backward angles for intermediate energy elastic nucleon-deuteron (Nd) scattering.
In this work, Nd cross sections are studied using Hamiltonian models consisting of a two-nucleon potential and 2piE-3NPs with a large cutoff mass parameter by adding phenomenological repulsive 3NPs as a counterpart. The use of the large cutoff mass parameter brings an increase of the ND cross sections at backward angles, which tends to reduce the discrepancies between previous calculations and data. This indicates an importance of the pion-exchange process at medium range region in the 2piE-3NP. Furthermore, possible spin-dependence of phenomenological repulsive 3NPs will be discussed in comparing with ND polarization observables.

Author: Prof. ISHIKAWA, Souichi (Hosei University)

Presenter: Prof. ISHIKAWA, Souichi (Hosei University)

Session Classification: Parallel Session Friday: Few-Nucleon Systems

Track Classification: Nuclei