Contribution ID: **32** Type: **Talk**

Solutions of the Faddeev-Yakubovsky equations for five-nucleon systems

Monday 2 September 2019 11:50 (35 minutes)

Rigorous solution of the few-particle scattering problem is one of the most complex and important problems of Quantum Mechanics. In early 60's Faddeev formulated the t-matrix approach [1], providing a mathematically rigorous description of the three-particle scattering problems governed by short-ranged interactions. This formalism has been generalized by Yakubovsky [2] to any number of particles. Regardless presence of the formal theory –progress in solution of Faddeev-Yakubovsky equations (FYe's) is slow and only very recently rigorous numerical solution of a five-body problem has been achieved by this formalism [3].

In this presentation I will shortly describe the numerical tools employed to solve FYe's in configuration space. Then some recent applications will be presented. In particular, related to low energy neutron scattering on ^{4}He by involving hadronic parity violation. As well possible existence of the resonant states in ^{5}H nucleus will be studied. Modern realistic nuclear Hamiltonians are employed in describing these five-nucleon systems.

[1] L.D. Faddeev, Sov. Phys. JETP12, 1014 (1961).
[2] O. A. Yakubovsky, Sov. J. Nucl. Phys.5, 937 (1967).
[3] R. Lazauskas, Phys. Rev. C 97, 044002 (2018).

Author: Dr LAZAUSKAS, Rimantas (IPHC, Strasbourg)

Presenter: Dr LAZAUSKAS, Rimantas (IPHC, Strasbourg)

Session Classification: Plenary Session 2 Monday

Track Classification: Plenary