



NEW YORK CITY COLLEGE OF TECHNOLOGY
Physics Department
Seminar in Theoretical Physics

Study of the nuclear interaction in few-nucleon systems

Presented by:

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Abstract

Few-nucleon physics is a field rich with high-quality experimental data and possibilities for accurate calculations of strongly correlated quantum systems. In this talk I discuss the application of the hyperspherical harmonic (HH) method to the study of the bound states and of low-energy scattering processes of $A=3$ and 4 nuclear systems. When the wave function of the system is expanded over a sufficiently large set of HH basis functions quite accurate results can be obtained for the observables of interest. Such an accuracy allows for critical tests of the various models of the nuclear interaction, in particular, of the NN and 3N interactions derived in the framework of the chiral effective theory. We have recently studied also the parity-violating components of the NN interaction, a topic which is now receiving a lot of experimental interest in the US, at Los Alamos, Oak Ridge, NIST, etc. In particular, I will present the theoretical study of neutron spin rotation induced by parity-violating components in the nucleon-nucleon potential in polarized n-d scattering at zero energy.