Title:
Hadron-Hadron Interactions from Lattice QCD

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Abstract:

I will review the recent progress on lattice QCD calculations for interactions among hadrons. We utilize the Nambu-Bethe-Salpeter (NBS) wave function, which carries the appropriate phase shift information at long distance region. The hadron-hadron interaction kernel, or the potential, is calculated from the NBS wave function, so that the potential is faithful to phase shift by construction. The method is applied for the parity-even central and tensor forces in NN system, and the obtained potentials are found to have desirable features such as attractive well at long and medium distances, and the central repulsive core at short distance. The applications to hyperon-nucleon (YN) and hyperon-hyperon (YY) interactions as well as meson-baryon interactions will be given. These results also provide deeper insight toward the understanding of the physical origin of the repulsive core. We also extend the method to the three nucleon system. The formulation to obtain the genuine three nucleon force is discussed, and the preliminary result will be presented.