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Recent progress on nuclear potentials from lattice QCD

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I review the recent progress on the determination of potentials between baryons from lattice QCD, based on works by HAL (Hadron to Atomic nuclei from Lattice) QCD Collaboration, who uses the Bethe-Salpeter amplitudes to extract potentials in quantum field theories. The method is first applied to two nucleons on the lattice with quenched QCD simulations. By disentangling the mixing between the S-state and the D-state, both central and tensor potentials in the leading order of the velocity expansion of the non-local NN potential are obtained. The method has also been applied to hyperon-nucleon potentials and hyperon-hyperon potentials. The possible extension of the method to extract hadron interactions in general from lattice QCD is also discussed.

Primary author: Prof. AOKI, Sinya (University of Tsukuba)

Presenter: Prof. AOKI, Sinya (University of Tsukuba)

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