

Ab initio approach to light nuclear systems based on quantum chromodynamics

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目的 (1) Comprehensive study of generalized baryon-baryon (BB) interaction including strangeness. (2) Physical point lattice QCD calculations for the systems with implementing an efficient numerical algorithm. (3) Its application to light hypernuclear systems.

内容 (1) Lattice QCD measurements are performed by using supercomputers with implementing the efficient algorithm. (2) Few-body problems of light (hyper-)nuclear systems are solved by using stochastic variational method.

結果 (1) Hyperon nucleon potentials at almost physical point with strangeness $S=-1$ are obtained. (2) Phase shifts are calculated from the lattice potentials.

[1] H. Nemura CPC207 91 (2016). arXiv:1510.00903 [hep-lat].

[2] H. Nemura arXiv:1810.04046 [hep-lat].

図 Scattering phase shifts of Sigma-N ($I=3/2$) systems computed from almost physical point lattice QCD potentials in $1S0$ channel (left) and in $3S1$ channel (right).

