Coupled channel approach to baryon-baryon interactions with strangeness on the lattice

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We investigate hyperonic interactions by lattice QCD simulation. Knowledge of hyperonic interactions, especially for the strangeness S=-2, is indespensable to study hypernuclear structure and exotic few body state, like H-dibaryon. Our approach to baryon-baryon interactions from lattice QCD is deriving a potential from inverting coupled channel Schroedinger equation using NBS wave function simulated on lattice. The flavor SU(3) breaking effects of the potential matrix are discussed by comparing with results of gauge configurations with different quark masses. Our numerical results are obtained from three ensembles of 2+1 flavor QCD gauge configurations, which corresponds to $m_\pi \sim 700, 570, 410$MeV, provided by the PACS-CS Collaboration. Baryon-baryon bound state in the strangeness S= -2, -3, -4 sectors are explored on these gauge configurations.

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