Core-excitation three-cluster model description of ${}^{10}_{\Lambda\Lambda}$Be

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Content

Core-excitation three-cluster model is applied to neutron (n) rich nuclei ^{8}He and ^{10}He [1]. These three-cluster systems ^{8}He and ^{10}He consist of ^{6}He -n-n and ^{8}He-n-n, respectively. By replacing n (^{8}He) into the Λ particle (^{8}Be) we regard ${}^{10}_{\Lambda\Lambda}$Be as ^{8}Be-Λ-Λ system. The core nucleus ^{8}Be is decomposed into 2α particles and the ^{8}Be-Λ interaction is introduced from α-α-Λ three-body model [2] calculated by Faddeev formalism. In addition, the Λ-Λ potential is introduced phenomenologically out of the scattering length and the effective range obtained from chiral effective field theory [3]. The binding energies of ${}^{10}_{\Lambda\Lambda}$Be (ground and excited states) are also calculated using the core-excitation three-cluster model in the Faddeev formalism. Figure 1 shows preliminary results of the energy spectrum of ${}^{10}_{\Lambda\Lambda}$Be (ground and excited states) calculated using several Λ-Λ potentials (Juelich[3], ESC16, ESC08c, Ehime-2, Ehime-A, Ehime-B).

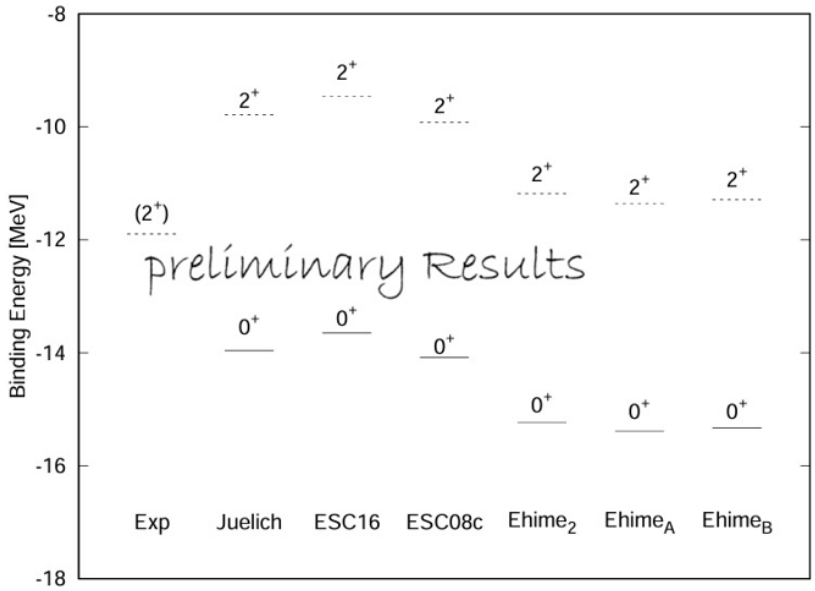

Fig.1 Energy spectrum of ${}^{10}_{\Lambda\Lambda}$Be. Unit is in MeV.

Reference

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Field of Research: Interactions of mesons and baryons with strangeness
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