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Heavy meson-nucleon molecules in the meson exchange model

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Hadron interactions are important for understanding the hadron composite states such as exotic hadrons and hadronic nuclei. However natures of hadron interactions are still poorly understood. In recent years, lattice QCD analysis and measurements of correlation functions in heavy-ion collisions have provided information on the heavy hadron interactions.

In this work, we investigate the interaction of open heavy meson ($P = \bar{D}, B$) and nucleon. The PN system is in a genuine exotic pentaquark channel with $\bar{Q}qqqq$. In 2022, ALICE collaboration reported the pD^- correlation function which agrees with the attractive interaction models. We construct the hadron interaction based on the CD-Bonn model, being one of the realistic nuclear force, and the heavy hadron effective lagrangian respecting to the heavy quark symmetry. We discuss the PN bound state and a role of our model interactions. We also discuss the heavy quark spin multiplet structure in obtained energy spectra.

Theory / experiment

Theory

Group or collaboration name

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