



量子物理学・ナノサイエンス第 278 回セミナー

## Heavy hadronic molecules: pion exchange and coupling to compact states

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### 概要

Near the heavy hadron threshold, many exotic states have been observed in the experiments, while those structures are not explained by the standard hadron picture. Those exotics are expected to be a multi-quark state such as the hadronic molecule and compact multi-quark. Especially, near the hadron threshold, hadronic molecules as a hadron composite could be generated dynamically. However, the hadron interaction which is an important ingredient has not been understood well. In this talk, we study the hidden-charm meson-baryon molecules, which can be compared with the pentaquark  $P_c$  reported by the recent Large Hadron Collider beauty (LHCb) experiment. Then, we introduce the one pion exchange potential (OPEP) as a long range interaction, and the short range interaction induced by coupling to the compact five-quark states. The OPEP is one of the basic interactions in the nuclear physics which includes the tensor term producing an attraction, and is enhanced by the heavy quark symmetry in the heavy quark sector. The short range interaction is given by coupling of molecules and compact five-quark states, where the spin structure is important to determine the relative strength for channels. By solving the coupled-channel Schrodinger equations, the energy spectra and the role of the interactions are discussed.

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