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Exotic dibaryons with a heavy antiquark

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The hadron-nucleus systems are interesting and important topics in the hadron and nuclear physics.
Recently, there have been many studies for the hadronic few-body states in light flavor sector, and these interesting phenomena caused by the impurity effects, e.g. glue-like effects and high-density states, have been discussed.

We discuss the possible existence of exotic dibaryons with a heavy antiquark,
and investigate three-body systems, Dbar*()NN and B*()NN.
The specific feature of such Dbar (B) nuclei is the exotic flavor
structure.
These bound states are genuinely exotic states with no quark-antiquark annihilation.
We emphasize that there is no corresponding states in strangeness sector, e.g. KNN, because the interaction between a K meson and a nucleon is repulsive.
We consider the one pion exchange potential (OPEP) between a heavy meson P*() and a nucleon N, where P*()=Dbar*() and B*().
Thanks to the mass degeneracy between P and P*mesons, the OPEP is enhanced and produces a strong attraction.
As for the NN interaction, we employ the Argonne v'_8 potential.
By solving the coupled channel equations for PNN and P*NN channels,
we obtain bound and resonant states.
As a consequence, we find bound states for (I,JˆP)=(1/2,0ˆ-) as well as resonant states for (I,JˆP)=(1/2,1ˆ-) both in Dbar*()NN and B*()NN systems.
It is turned out that the tensor force of OPEP mixing PN-P*N channels plays an important role to yield a strong attraction.

Primary author: Mr YAMAGUCHI, Yasuhiro (RCNP, Osaka University)

Presenter: Mr YAMAGUCHI, Yasuhiro (RCNP, Osaka University)

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