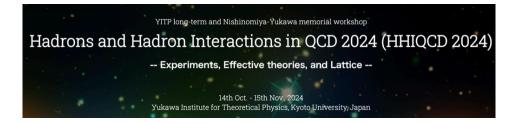
HHIQCD2024



Contribution ID: 43

Type: 1st and 2nd weeks (Hadron structure and interactions)

$_{cJ}(2P)$ with hadronic molecules

Thursday, October 17, 2024 10:00 AM (30 minutes)

Some hadrons are hard to explain as normal hadrons made of quarks and antiquarks, or three quarks. These are called exotic hadrons. Since the Belle experiment reported X(3872) in 2003, more exotic hadrons containing charm quarks have been found. Exotic hadrons are believed to have more complex structures than normal hadrons, but no conclusion has been reached yet.

The X(3872) is one of the most famous exotic hadrons and has been seen in many experiments. It has the same quantum numbers as $_{c1}(2P)$, but its mass is different from what the quark model predicts. It is also very close in mass to the $D^0 \bar{D}^{*0}$ threshold, with a difference of 0.04 MeV.

In this study, we analyze $_{cJ}(2P)$ as a mixture of a hadronic molecule state, like a deuteron, and a bare $_{cJ}(2P)$ core, comparing it to X(3872) and others. We consider one-boson-exchange and core-molecule mixture potentials.

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Session Classification: 1-day Workshop (1st week)