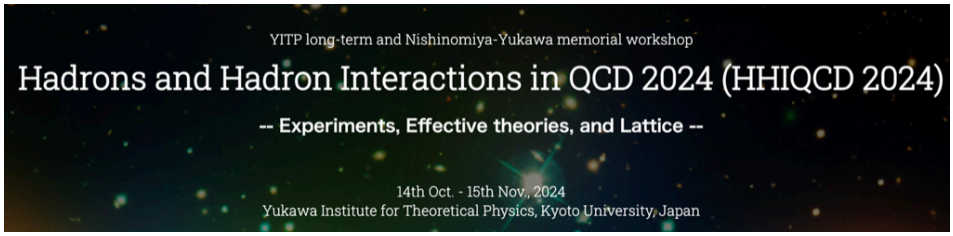

Contribution ID: **38** Type: **1st and 2nd weeks (Hadron structure and interactions)**

Analysis of bound and resonant states of doubly heavy tetraquaks as hadronic molecules

Thursday, October 17, 2024 11:00 AM (30 minutes)

Exotic hadrons are important subjects in the hadron physics. These states which lie slightly below the threshold have been expected to be hadronic molecules of two ordinary hadrons.

T_{cc} was reported by the LHCb experiment in 2022 and this state is consistent with an isoscalar state whose J-parity is 1^+. The Breit-Wigner mass relative to the $D^{*+}D^0$ threshold is $-0.273\,\mathrm{MeV}$. Therefore, we consider T_{cc} with $0(1^+)$ as $D^{(*)}D^{(*)}$ molecule where we employ the one boson exchange potential as the interaction. In this analysis, we solve the coupled channel Schrodinger equation due to the heavy quark spin symmetry (HQS). Here, we can explain T_{cc} with $0(1^+)$ as the hadronic molecule well. We also analysis the resonant state of T_{cc} with $0(1^+)$ and bound and resonant states of T_{cc} with other quantum number. However, these states are not obtained in our study. In addition, we investigate the bound and resonant states of T_{bb} as $B^{(*)}B^{(*)}$ molecules. There are many bound and resonant states of T_{bb}. Finally, we introduce the light cloud basis where we can decompose the spin wavefunction into the spins of heavy diquarks and light cloud. This basis classifies the bound and resonant states which are obtained by our analysis by their heavy quark spins and light cloud.

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