



Contribution ID: 153

Type: **Parallel**

Interactions between two heavy mesons within heavy meson chiral effective field theory

Tuesday, 20 August 2019 15:05 (20 minutes)

We have studied the interactions between two heavy mesons [D-D or B-B] within heavy meson chiral effective field theory and investigated possible molecular states. The effective potentials are calculated with Weinberg's scheme up to one-loop level. At the leading order, four body contact interactions and one pion exchange contributions are considered. In addition to two pion exchange diagrams, we include the one-loop chiral corrections to contact terms and one pion exchange diagrams at the next-to-leading order. The behaviors of effective potentials both in momentum space and coordinate space are investigated and discussed extensively. We notice the contact terms play important roles in determining the characteristics of the total potentials. The possible molecular states are also investigated and the binding energies are provided by solving the Schrodinger equation.

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Session Classification: Session 4: Hadron decays, production and interactions

Track Classification: Session 4: Hadron decays, production and interactions