Contribution ID: **37** Type: **not specified**

Quarkonium Hybrids with Nonrelativistic Effective Field Theories

Wednesday, 17 February 2016 17:55 (25 minutes)

We use nonrelativistic effective field theories to obtain from QCD the Schrödinger equations describing quarkonium hybrids and the static interaction potential in the region from small to intermediate quark-antiquark distance. The nonperturbative parameters appearing in the potential are fixed by the lattice calculation of the gluelump mass and the hybrid static energy, the rest is calculated in perturbation theory. We solve the coupled Schrödinger equations, taking into account the so-called Λ-doubling terms and defining an appropriate renormalon-free scheme. We obtain predictions for quarkonium hybrid multiplet masses in the cgcbar, bgcbar, and bgbbar sectors and we compare to the experimental data. The effect of the Λ-doubling terms is a breaking of the degeneracy between spin symmetry multiplets with opposite parity. Reducing the error in the gluelump mass lattice calculation would allow us to reduce the error in our predictions. We discuss the relation of our description with the so-called Born-Oppenheimer approximation used in QCD to define the hybrid static energies and we compare our results on the hybrid masses with lattice and sum rules calculations.

from upcoming publication (report no. TUM-EFT 45/14)
M. Berwein, N. Brambilla, J. Tarrus Castella, A. Vairo

Primary author: BERWEIN, Matthias (TU München)

Presenter: BERWEIN, Matthias (TU München)

Session Classification: Talks