

Confront the lattice finite-volume energy levels with chiral effective field theory

Tuesday, July 24, 2018 2:40 PM (20 minutes)

In this talk, we will introduce the finite-volume effects in the chiral effective field theory and analyse the lattice finite-volume energy levels to extract the resonance properties with the unphysical and physical pion masses. Special attention will be paid to the $a_0(980)$ from the coupled-channel scattering of π - η , K - \bar{K} and π - η' . Preliminary results on the D - π , D - \bar{K} and D - η scattering will be also presented.

A global fit to recent lattice finite-volume energy levels from π - η scattering and relevant experimental data on a π - η event distribution and the γ - $\gamma \rightarrow \pi$ - η cross section is performed. Both the leading and next-to-leading-order analyses lead to similar and successful descriptions of the finite-volume energy levels and the experimental data. However, these two different analyses yield different π - η scattering phase shifts for the physical masses for the π , K , η and η' mesons. The inelasticities, the pole positions in the complex energy plane and their residues are calculated both for unphysical and physical meson masses.

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