The 34th International Symposium on Lattice Field Theory (Lattice 2016)

Contribution ID: **7** Type: **Talk**

An a_0 resonance in strongly coupled $\pi\eta$, $K\overline{K}$ scattering from lattice QCD

Tuesday, July 26, 2016 4:50 PM (20 minutes)

We present the first calculation of coupled-channel meson-meson scattering in the isospin $= 1$, G-parity negative sector, with channels $\pi\eta$, $K\overline{K}$ and $\pi\eta'$, in a first-principles approach to QCD. From the discrete spectrum of eigenstates in three volumes extracted from lattice QCD correlation functions we determine the energy dependence of the S-matrix, and find that the S-wave features a prominent cusp-like structure in $\pi\eta \to \pi\eta$ close to $K\overline{K}$ threshold coupled with a rapid turn on of amplitudes leading to the $K\overline{K}$ final-state. This behavior is traced to an $a_0(980)$-like resonance, strongly coupled to both $\pi\eta$ and $K\overline{K}$, which is identified with a pole in the complex energy plane, appearing on only a single unphysical Riemann sheet. Consideration of D-wave scattering suggests a narrow tensor resonance at higher energy.

Primary author: DUDEK, Jozef (Jefferson Lab)

Presenter: DUDEK, Jozef (Jefferson Lab)

Session Classification: Hadron Spectroscopy and Interactions

Track Classification: Hadron Spectroscopy and Interactions