38th INTERNATIONAL CONFERENCE
ON HIGH ENERGY PHYSICS
AUGUST 3 - 10, 2016
CHICAGO

Contribution ID: **366** Type: **Oral Presentation**

Resonances in coupled channel scattering from lattice QCD (15' + 5')

Saturday, 6 August 2016 14:00 (20 minutes)

The excited states in hadron physics are seen as resonances in the scattering of light stable states in QCD, like π, K and η mesons. Many excited states also decay into multiple final states, necessitating coupled-channel analyses. Recently it has become possible to obtain coupled-channel scattering amplitudes using lattice QCD. Using a large diverse basis of operators we are able to obtain a reliable finite volume spectrum describing, for example, the $\pi\eta$, $K\bar{K}$ coupled system. Utilising the finite volume formalism proposed by Luescher and extended by several others, we are able to describe the spectra from each lattice symmetry group and this enables constraints to be derived for S, P and D-wave scattering. In S-wave we find a resonant scattering amplitude containing a pole on an unphysical sheet close to $K\bar{K}$ threshold, with some similarities to the $a_0(980)$ seen in experiment. Possible future extensions, and results from related studies such as the ρ resonance at multiple pion masses, and πK scattering will also be presented.

Primary author: Dr WILSON, David (for the Hadron Spectrum Collaboration)

Presenter: Dr WILSON, David (for the Hadron Spectrum Collaboration)

Session Classification: Strong Interactions and Hadron Physics

Track Classification: Strong Interactions and Hadron Physics