Contribution ID: **3** Type: **Talk**

Pion mass dependence in $D\pi$ scattering and the $D_0^*(2300)$ resonance from lattice QCD

Thursday, 4 July 2024 09:55 (25 minutes)

Lattice QCD results for isospin $I = \frac{1}{2}$ $D\pi$ scattering are presented. Utilizing a series of $N_\mathrm{f} = 2 + 1$ Wilson-Clover ensembles with pion masses of $m_\pi \approx 132, 208, 305$ and 317 MeV, various two-particle operators are constructed and the corresponding finite-volume spectra are determined. The S and P-wave scattering phase shifts are then extracted using the Lüscher approach. A clear trend for the motion of the $D_0^*(2300)$ pole is identified. With the physical pion mass configurations also included, this calculation constitutes the first lattice calculation in which the pion mass dependence of the $D_0^*(2300)$ pole is investigated and the scattering lengths are extrapolated/interpolated to the physical pion mass in $D\pi$ scattering.

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Session Classification: Talks