

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

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Lattice QCD results for isospin $I = \frac{1}{2}$ $D\pi$ scattering are presented. Utilizing a series of $N_f = 2 + 1$ 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.

Primary author: Mr YAN, Haobo (Peking University)

Co-authors: LIU, Chuan (Peking University); Mr XING, Hanyang (Institute of Modern Physics, Chinese Academy of Sciences); LIU, Liuming (Institute of Modern Physics, Chinese Academy of Sciences); MENG, Yu (Zhengzhou University)

Presenter: Mr YAN, Haobo (Peking University)

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