

# $DK/D\pi$ scattering and an exotic virtual bound state from lattice QCD

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The ground state scalar D-mesons, the  $D_0^*(c\bar{l})$  and  $D_{s0}^*(c\bar{s})$ , do not adhere to expectations and have sparked much theoretical discussion. Although these mesons have been explored in previous lattice studies of  $D\pi$  and  $DK$  scattering, there are still questions about the underlying physics in this sector. In this poster, we report on a study where finite-volume spectra obtained from lattice QCD were used with the Lüscher method to provide constraints on infinite-volume scattering amplitudes, from which the pole singularities were determined. Working with SU(3) flavour symmetry, different scattering channels separate into SU(3) flavour irreps which allowed us to disentangle the different contributions to the  $J^P = 0^+$  open-charm sector. We found a deeply bound state strongly coupled to elastic scattering threshold, corresponding to the  $D_{s0}^*(2317)$ , and a virtual bound state in an exotic flavour channel. This poster is based on arXiv:2403.10498.

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