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$DK/D\pi$ scattering and an exotic virtual bound state at the SU(3) flavour symmetric point

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The nature of the lightest open-charm mesons in the scalar ($J^P = 0^+$) sector remains elusive despite many years of studies. These mesons do not appear to have properties in line with expectations and many possible explanations have been proposed. In this talk, 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. These findings will be compared with other approaches and the light-quark mass dependence will be discussed. This talk is based on arXiv:2403.10498.

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