

Dispersive analysis of the σ resonance, in $\pi\pi$ scattering, from lattice QCD

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We determine from lattice QCD the $I = 0, 1, 2$ $\pi\pi$ elastic scattering amplitudes for various quark masses. We study the quark mass dependence of the σ resonance and observe that, as an unstable particle, its pole position determination is very noisy. By performing a full dispersive analysis, we drastically reduce the systematic uncertainties associated with model extractions of the σ and low-energy $\pi\pi$ scattering, and determine the pole position with accuracy.

Primary author: RODAS BILBAO, Arkaitz (Old Dominion University / Jefferson Lab)

Presenter: RODAS BILBAO, Arkaitz (Old Dominion University / Jefferson Lab)

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