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The $\Lambda(1405)$ from lattice QCD: Something about determining the finite-volume spectra

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Hadronic scattering amplitudes determined in Lattice QCD using Lüscher's formalism depend crucially on the finite-volume energy spectrum. This work presents some of the technical details of the determination of such spectra within the study of the two-poles nature of the $\Lambda(1405)$ from Lattice QCD. Starting with the extraction of energy states from correlation functions, the GEVP technique has shown to be a useful tool to investigate the desired states, and two independent analyses were done in parallel, the so-called: Single Pivot and Rolling Pivot. This procedure was followed by a detailed analysis of the fits to ratios of correlators, which results in the energy difference of a certain level to the close-by energies of non-interacting mesons. The final results were in good agreement between both implementations and were ultimately used as input for the computation of the scattering amplitude.

Topical area

Hadronic and Nuclear Spectrum and Interactions

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