Contribution ID: **359** Type: **Parallel Talk**

Finite-volume scattering on the left-hand cut

Thursday, 3 August 2023 13:30 (20 minutes)

The Lüscher formalism is a well-known and widely used method for extracting scattering amplitudes from the finite-volume spectrum. Recent lattice QCD calculations involving systems where a lighter particle couples to heavier scattering particles (e.g. baryon-baryon scattering) have highlighted the limitations of the standard formalism below threshold. This is due to the presence of left-hand cuts in the partial-wave-projected scattering amplitudes. In this talk, we describe an extension of the existing framework to the left-hand cut, summarising the complete procedure including the solving of integral equations to extract physical observables. We further describe first numerical tests on mock data, and explicitly show the equivalence between our method and the familiar formalism in the regime where both are valid.

Topical area

Hadronic and Nuclear Spectrum and Interactions

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Session Classification: Hadronic and Nuclear Spectrum and Interactions