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A curious case of a strangeness resonance – lattice and experiment

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The double-pole structure of the strangeness $S=-1$ isoscalar baryon resonance has become a poster child for the complicated, non-perturbative structure of QCD at low energies. Traditionally, the most successful theoretical approach to study this state has been based on the extensions of Chiral Perturbation Theory. This remains so far the primary methodology underlying the pole positions quoted by the Particle Data Group.

Recent lattice QCD studies provided a new twist on that matter determining finite-volume spectrum at not too heavy pion mass including $\pi\Sigma$ and $K\bar{N}$ channels. The question to be discussed in this talk (2507.14283) is the consistency between lattice and experimental results bridged through Effective Field Theories.

We find that, indeed, new finite-volume results reduce the systematic uncertainties in resonance parameter determination, when appropriately added to the experimental measurements. Predictions are made for the not yet established isovector states, showing larger systematic uncertainties.

Parallel Session (for talks only)

Hadronic and nuclear spectrum and interactions

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