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The pole nature of the $\Lambda(1405)$: A lattice QCD calculation

Thursday 4 April 2024 11:00 (30 minutes)

This talk presents results of the first coupled-channel meson-baryon $\pi\Sigma - \bar{K}N$ computation from lattice QCD in the $\Lambda(1405)$ region. Correlation functions were calculated using a single ensemble with pion mass $m_\pi = 200$ MeV and kaon mass $m_\mathrm{K} = 487$ MeV, and included single- and multi-hadron operators. Once the finite-volume energy spectra were reliably extracted, the Lüscher method was employed to study scattering amplitudes. The final results exhibited two poles in the complex energy plane of the two-channel K-matrix for all parametrizations used. Their locations correspond to a virtual bound state below $\Sigma\pi$ threshold and a resonance pole below the $N\bar{K}$.

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