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Bringing scattering data to the finite volume of lattice QCD

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Hamiltonian effective field theory (HEFT) is an approach which allows for the extraction of hadron finite-volume energy spectra from scattering observables such as phase shifts and inelasticities. As an alternative to Luscher's method, HEFT easily generalises to systems with multiple coupled channels and multiple bare states. HEFT also allows for the extraction of eigenvectors from the Hamiltonian, providing new insight into the composition of finite-volume eigenstates and their dependence on the lattice volume. In this presentation we'll explore renormalisation in HEFT using pion-nucleon scattering data in the Delta resonance channel. By examining the composition of the Delta resonance and its dependence on the regulator parameter, connections with alternative renormalisation schemes are made.

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