Contribution ID: **12**   Type: **Parallel Talk**

The three-pion K-matrix at NLO in chiral perturbation theory

Thursday, 3 August 2023 14:30 (20 minutes)

The K-matrix parametrizes short-range interactions in the relativistic-field-theory finite-volume formalism. It is related to the infinite-volume scattering amplitude, thus providing a bridge between the lattice and perturbation theory, as well as a handle on finite-volume effects and the pion mass dependence. However, leading-order perturbative calculations agree very poorly with the results for systems of three interacting light mesons. I describe the calculation of the three-pion K-matrix from chiral perturbation theory at next-to-leading order, and demonstrate how this resolves most of the disagreement between perturbation theory and the lattice. Thereby, the two main tools for studying these interesting and experimentally inaccessible systems are reconciled.

Topical area

Hadronic and Nuclear Spectrum and Interactions

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Session Classification: Hadronic and Nuclear Spectrum and Interactions