“Three particles in a box: Mapping the finite-volume spectrum to the S-matrix”

Lattice QCD is the only known systematic method for calculating non-perturbative matrix elements in QCD, the theory of the strong interactions. However, there is currently no known method for extracting scattering and decay amplitudes involving more than two hadrons. The most promising approach, already developed by Martin Luescher for the two-particle case, is to extract amplitudes from the finite-volume spectrum. We present work towards generalizing Luescher's relation between finite-volume spectrum and S-matrix to include three-particle states.