DNP07-2007-000157

Abstract for an Invited Paper for the DNP07 Meeting of the American Physical Society

Excited Nucleon Resonance Properties from Lattice \mathbf{Q}\mathbf{C}\mathbf{D}^1 ADAM LICHTL, RIKEN BNL Research Center

We review the progress of the Lattice Hadron Physics Collaboration's ongoing efforts to determine the tower of excited nucleon resonances as predicted by QCD. The most common approach to this problem is to consider two-point correlations of interpolating operators calculated using lattice QCD. We show that realistic interpolating operators are essential for accessing the states of interest and describe how such operators can be designed. We outline how a variant of the variational method combined with a systematic fitting approach can be used to extract finite-volume spectra from the Green's functions, and illustrate the efficacy of the approach by showing preliminary results using two-flavors of dynamical fermions. We outline the connection between the finite-volume spectra obtained from the lattice and the continuum resonance states measured in experiment, and conclude with a discussion of current limitations and ongoing improvements.

¹for the Lattice Hadron Physics Collaboration