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Pion-N and Other Nucleon Excited States in Nucleon Two- and Three-point Functions

Wednesday, 2 August 2023 09:00 (20 minutes)

The excited states contamination in the nucleon three-point function is one of the major systematic errors in calculating nucleon form factors. We use Bayesian Reconstruction to study the nucleon excited states in the two-point nucleon and S11 correlators which are constructed from the valence overlap fermions on DWF configurations at the physical pion mass with a lattice size of 5.5 fm. We will show the observed Roper state and discuss the non-observation of the pion-nucleon states in the nucleon positive and negative parity channels. We will discuss its consequence in the nucleon three-point functions in the context of the pion-nucleon contamination due the current-enhanced boomerang diagram for the pseudoscalar current.

Topical area

Hadronic and Nuclear Spectrum and Interactions

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