



Contribution ID: 143

Type: **Talk**

Nucleon to Delta(1232) Resonance Transition Form Factors from Lattice QCD

Tuesday 4 November 2025 14:50 (20 minutes)

We present progress in a lattice QCD study of the electromagnetic and axial $N \rightarrow \Delta(1232)$ resonance transition form factors. Our long-term aim is to apply the Lellouch-Lüscher formalism to extract infinite-volume $N \rightarrow N\pi$ form factors from finite-volume matrix elements. We previously computed the required $N\pi$ scattering amplitudes on an ensemble with $N_f = 2 + 1$ clover fermions at $m_\pi \approx 255$ MeV and $L \approx 2.8$ fm, and obtained the Δ resonance parameters $m_\Delta = 1378(11)$ MeV and $g_{\Delta-N\pi} = 23.8(2.8)$. We have now additionally computed the three-point functions for six source-sink separations ranging from $t_{\text{sep}} = 0.7 - 1.2$ fm. Here, we present a first look at the three-point functions data by extracting the $N \rightarrow \Delta$ transition form factors using the single-hadron approach.

Parallel Session (for talks only)

Hadronic and nuclear spectrum and interactions

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Session Classification: Hadronic and nuclear spectrum and interactions