Contribution ID: **167** Type: **Oral**

Compton Amplitude of the Pion using Feynman-Hellmann

Wednesday 21 August 2024 18:10 (20 minutes)

The electromagnetic structure of hadrons can be determined by evaluating the scattering of light off the system, provided by the Compton amplitude. Such an evaluation is infeasible mathematically at low energies due to the non-perturbative nature of QCD. Lattice QCD provides a way to numerically determine these structures using a path-integral approach. To produce results in a feasible amount of time the computation is sped up by utilising heavier than physical quark masses. Utilising these methods can provide insight into the electromagnetic structure of any hadron of interest. The Feynman-Hellmann technique is utilised to effectively reduce such an evaluation from that of a four-point correlation function down to a simpler two-point correlation function. While previous work has been done in determining the Compton amplitude of the nucleon, the less explored pion presents a particularly difficult case to evaluate. The lighter mass of the pion makes it more susceptible to noise when evaluating boosted correlation functions of the system. I present preliminary results for the Compton amplitude of the pion at a fixed photon momentum. Additionally, I will discuss ongoing research into the applications of All-Mode Averaging (AMA) as a noise reduction technique to improve these results for further analysis.

Authors: Dr ZANOTTI, James (The University of Adelaide); MCKEE, Jordan; Dr CAN, K. Utku (The University of Adelaide); YOUNG, Ross

Presenter: MCKEE, Jordan

Session Classification: Light Quarks

Track Classification: B: Light Quarks