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Exploring Light Meson Resonances in Two-Pion Photoproduction: A Regge Formalism Analysis

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In the domain of hadron spectroscopy, the investigation of meson resonances plays a pivotal role. This study focuses on the significance of two-pion photoproduction as a prominent avenue for studying meson resonances in the $\pi\pi$ system. By employing the Regge formalism, our model incorporates the background contribution from the well-known "Deck Mechanism" and emphasizes the significant $\rho(770)$ resonance, representing the P-wave contribution arising from pomeron and f_2 exchanges. Extending the model, we account for additional physics by encompassing scalar mesons, namely σ and $f_0(980)$, contributing to the S-wave behavior, while also considering non-resonant P and S components. After fitting the model to a subset of moments, we proceed to compare our predictions for the angular moments with experimental data obtained from CLAS. Our analysis reveals a noticeable breakdown of the approximate s-channel helicity conservation (SCHC) at higher four momentum transfers, adding new insights into the intricate dynamics of meson resonances. Furthermore, we extract the t-dependence of the Regge amplitude residue function for the subdominant exchanges, shedding light on their contribution to the overall dynamics.

Parallel Session

Hadron Spectroscopy

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