

Studying the production mechanisms of light meson resonances in two-pion photoproduction: A Regge Approach

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Hadron photoproduction is an essential experimental tool that gives important information on the spectroscopic and structural nature of hadrons. At large photon energies and low invariant mass of the $\pi\pi$ subsystem, the differential cross section is dominated by the prominent $\rho(770)$ resonance. At forward angles, the production of the ρ is mostly diffractive, and exhibits a hierarchy of partial waves which may be interpreted as the result of approximate s -channel helicity conservation (SCHC). Regge formalism captures these reaction properties in terms of the Pomeron exchange. In this talk, we present a theoretical model of two-pion photoproduction which encodes the prominent ρ resonance and the expected leading background contribution coming from the so-called “Deck” or “Drell-Soding” mechanism. After fitting this model to a subset of moments, we compare our predictions for the angular moments with the CLAS data. We observe the apparent breakdown of SCHC at larger four momentum transfers, and extract the t -dependence of the Regge amplitude residue function for subdominant exchanges.

Primary authors: BIBRZYCKI, Łukasz (AGH University of Science and Technology); HAMMOUD, Nadine (Institute of Nuclear Physics PAS); MATHIEU, Vincent; PERRY, Robert (University of Barcelona); SZCZEPANIAK, Adam (Indiana University)

Presenter: PERRY, Robert (University of Barcelona)

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