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Studying light flavour resonances with polarised photon beams

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The study of exotic mesons such as gluonic hybrids gives a greater insight into how quarks and gluons bind to form such states and hence increase our understanding of the fundamental strong force. Furthermore, the double pion photoproduction is known as a ideal tool for the investigation of nucleon resonances, especially the exotic meson states. Hereby, to study the interference of meson resonance production and meson-baryon rescattering effects, we focus on the reaction $\gamma p \rightarrow \pi^+ \pi^- p$. Aiming at the description of the latest data collected at CLAS12 and GlueX experiments, we used Deck model with a virtual pion exchange to generalize the moment extraction formalism with a linearly polarized photons. We compute the moments of the $\pi^+ \pi^-$ angular distribution with $E_\gamma = 8.5 \text{ GeV}^2$ for $L = 0, 1, 2, 3, 4$ in the helicity frame i.e the rest frame of the $\pi\pi$ with the direction opposite to the recoil nucleon defining the z axis. The importance of such moments is that one can use them to calculate the beam asymmetry function.

In-person participation

Yes

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