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Studying light flavour resonances in $\pi^+\pi^-$ photoproduction

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The double pion photoproduction is known as an ideal tool for the investigation of nucleon resonances, especially the exotic meson states. To study the interference of meson resonance production and meson-baryon rescattering effects, we focus on the reaction $\gamma p \rightarrow \pi^+\pi^-p$. We used Deck model to describe the essential features of the diffractive $\pi^+\pi^-$ photoproduction, assuming that it is dominated by virtual pion exchange. Aiming at the description of the latest data collected at CLAS12 and GlueX experiments, we computed the moments of the $\pi^+\pi^-$ angular distribution for different beam energies 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. We also computed the prediction for the P -wave projected differential cross section and compared it by the ones performed by the CLAS collaboration in order to validate our theoretical model.

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