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Helicity Dependence of the \vec$\gamma$\vec N \to π N Reaction Channels in the Δ-Resonance Region

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Abstract: Based on a prior effective Lagrangian model on single pion photoproduction from the nucleon, successfully tested in total and differential cross sections, the helicity dependence from the interaction of circularly polarized photons and a longitudinally polarized nucleon target is studied in the energy range from π-threshold through the $\Delta(1232)$-resonance region. The doubly polarized total and differential cross section differences for parallel $\sigma^{3/2}$ and antiparallel $\sigma^{1/2}$ helicity states are predicted and compared with recent experimental data. We show that the results are sensitive to interferences among different contributions to the process and, thus, represent a complementary test of the theoretical model. A quite satisfactory agreement with recent experimental data from the GDH-collaboration is obtained.

Key Words: photoproduction reactions, meson production, polarization phenomena in reactions.

Keywords
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