New results from CLAS on the $ep \to e'\pi^0 p$ beam spin asymmetry in the resonance region.

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Abstract

The N^* program in Jefferson Lab is crucial for understanding the strong interaction in non-perturbative regime and the emergence of hadron mass. Studies of resonance electroexcitation in $N\pi$ electroproduction represent an important part of these efforts. The data on beam spin asymmetry provide unique information on the imaginary part of the interference terms between the electroproduction amplitudes with the longitudinally and transversely polarized virtual photons. The new CLAS results on beam spin asymmetry and polarized structure function $\sigma_{LT'}$ for $\pi^0 p$ electroproduction at invariant masses of the final hadrons from the threshold and up to 1.8 GeV and at photon virtualities 0.4 GeV^2 $< Q^2 <$ 1.0 GeV^2 will be presented in the talk. Analyses of these results demonstrated sensitivity of the Legendre moments of the $\sigma_{LT'}$ structure function to the electroexcitation amplitudes of the nucleon resonances in the mass range $>$ 1.6 GeV. Combined studies of beam spin asymmetries and unpolarized cross sections for $\pi^0 p$ electroproduction channel will allow us to improve knowledge on Q^2-evolution of the resonance electroexcitation amplitudes, in particular, for the resonances in the third resonance region.