Precision Measurements of π^0 Electroproduction near Threshold: A Test of Chiral QCD Dynamics

contributed by R. Lindgren

for

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Absolute cross sections of the $p(\vec{e}, e'p)\pi^0$ reaction were measured from threshold up to $\Delta W = 30$ MeV above threshold in steps of invariant mass W = 1 MeV and at four-momentum transfers in the range from $Q^2 = 0.050 \text{ GeV/c}^2$ to $Q^2 = 0.150 \text{ GeV/c}^2$ in steps of $\Delta Q^2 = 0.01 \text{ GeV/c}^2$. The experiment was performed at Jefferson Laboratory using the Hall A Left High Resolution Spectrometer (LHRS) to detect the electron and the large acceptance BigBite spectrometer instrumented with MWDC followed by $E - \Delta E$ scintillation paddles to detect and identify the proton. Cuts on the missing mass were used to identify the π^0 . Angular distributions of the structure functions $\sigma_T + \epsilon_L \sigma_L$, σ_{TL} , and σ_{TT} were extracted using the measured ϕ^*_{π} dependence of the cross section. Angular distributions of the beam asymmetry $A_{TL'}$ were also extracted. Total cross sections, structure function angular distributions, and beam asymmetries will be compared with recent Mainz experimental results and HBCHPT, DMT, and MAID models.