

Photoproduction of the π^0 meson from 3.6 - 5.5 GeV

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Exclusive neutral pion photoproduction ($\gamma p \rightarrow p\pi^0$) was measured in the CLAS detector at the Thomas Jefferson National Facility. The experiment employed a 1.1-5.5 GeV bremsstrahlung photon beam from 5.6 GeV electron beam created in the Continuous Electron Beam Accelerator Facility (CEBAF). The photon beam energy was impinged on a liquid hydrogen target. The neutral pions were detected via external conversion, $\pi^0 \rightarrow \gamma\gamma \rightarrow e^+e^-\gamma$, and subsequent Dalitz decay, $\pi^0 \rightarrow \gamma^*\gamma \rightarrow e^+e^-\gamma$. Measured differential cross-sections, $\frac{d\sigma}{dt}$ and $\frac{d\sigma}{d\cos\theta}$ are compared with the Regge model. The Regge theoretical calculations underestimate the differential cross sections between 3.9 and 4.6 GeV, but agree with data at photon energies 4.6-5.4 GeV.