

Abstract Submitted  
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**Measurement of differential cross sections via  $p(e, e'\pi^+)n$  for studying high-lying resonances at high  $Q^2$**  KIJUN PARK, VOLKER BURKERT, JLab, CLAS COLLABORATION — An extensive experimental programs has been carried out at Jefferson Laboratory to study the excitation resonances using the CE-BAF Large Acceptance Spectrometer (CLAS). Pion electroproduction on protons is sensitive to the resonance excitation and allows us to explore its internal structure. The CLAS is well suited for the study of a broad range of kinematics in the invariant mass  $W$  and photon virtuality  $Q^2$  with nearly complete angular coverage for the hadronic decays. Electron scattering allows us to probe the effective degrees of freedom in excited nucleon states from meson-baryon cloud to dressed quarks in terms of varying distance scale. In this talk, we report the differential cross-sections for exclusive single charged pion electroproduction from proton targets. The kinematic range covers  $Q^2$  from 1.7 GeV<sup>2</sup> to 4.5 GeV<sup>2</sup> and  $W$  from 1.6 GeV to 2.0 GeV. Separated structure functions are also presented and compared with the present calculations and previous measurements. This work, along with an upcoming analysis of same kinematics from exclusive  $p\pi^0$  and  $p\pi^+\pi^-$  electroproduction will allow the determination of electro-couplings of several high-lying excited proton states, for the first time, at photon virtualities that correspond to transition toward dominance of quark degrees of freedom.

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