

# A measurement of the differential cross section for the exclusive $\pi^-$ electro-production from deuterium

Jixie Zhang, Gail Dodge (for the CLAS Collaboration)

*Jefferson Lab*

(Dated: September 20, 2012)

Differential cross sections for exclusive  $\pi^-$  electro-production from the neutron in the reaction  $e+d \rightarrow e'+\pi^-+p+p_r$  have been measured over a broad kinematics range. The experiment was performed using a newly built radial time projection chamber (RTPC) and the CEBAF Large Acceptance Spectrometer (CLAS) at Jefferson Lab. The RTPC detector was specially built to detect low energy recoil protons and had a valid momentum acceptance from 67 to 250 MeV/c. Electron scattering data were taken with beam energies of 2.1, 4.2 and 5.3 GeV using a 7 atm gaseous deuterium target. The differential cross sections for  $D(e, e'\pi^-p)p$  have been extracted, with the proton detected either by the CLAS or by the RTPC. The structure functions  $\sigma_T + \varepsilon\sigma_L$ ,  $\sigma_{LT}$  and  $\sigma_{TT}$  are also extracted and compared to MAID and SAID predictions.