Semi-Inclusive Pion Electroproduction in Deep Inelastic Scattering

WESLEY GOHN, U. of Connecticut, HARUT AVAKIAN, Jefferson Lab, KYUNGSEON JOO, MAURIZIO UNGARO, U. of Connecticut, CLAS COLLABORATION — Measurements of pion electro-production in semi-inclusive deep inelastic scattering (SIDIS) have been performed. Data were taken with the CEBAF Large Acceptance Spectrometer (CLAS) at Jefferson Lab using a 5.498 GeV longitudinally polarized electron beam and an unpolarized liquid hydrogen target during the E1-f run period in 2003. All three pion channels ($\pi^+$, $\pi^0$ and $\pi^-$) were measured simultaneously over a large range of kinematics ($Q^2 \approx 1-4 \text{ GeV}^2$ and $x \approx 0.1-0.5$).

Preliminary results from our study of single-spin azimuthal asymmetries from all three pion channels as functions of $x$, $z$, and $P_T$, from which $A_{LU}^{\sin \phi}$ is extracted, will be presented, as will preliminary measurements of $A_{UU}^{\cos \phi}$ and $A_{UU}^{\cos 2\phi}$ in the charged pion channels. This new high statistical data could provide access to transverse-momentum dependent parton distribution functions (TMD’s), which are thought to be important in understanding of the physics underlying the spin structure of the nucleon.

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