



Nuclear Experiment

Single Spin Asymmetries in Charged Pion Production from Semi-Inclusive Deep Inelastic Scattering on a Transversely Polarized ^3He Target

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We report the first measurement of target single spin asymmetries in the semi-inclusive $^3\text{He}(e, e'\pi^\pm)\text{X}$ reaction on a transversely polarized target. The experiment, conducted at Jefferson Lab using a 5.9 GeV electron beam, covers a range of $0.14 < x < 0.34$ with $1.3 < Q^2 < 2.7 \text{ GeV}^2$. The Collins and Sivers moments were extracted from the azimuthal angular dependence of the measured asymmetries. The extracted π^\pm Collins moments for ^3He are consistent with zero, except for the π^+ moment at $x=0.34$, which deviates from zero by 2.3σ . While the π^- Sivers moments are consistent with zero, the π^+ Sivers moments favor negative values. The neutron results were extracted using the nucleon effective polarization and the measured cross section ratio of proton to ^3He , and are largely consistent with the predictions of phenomenological fits and quark

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model calculations.

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