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Correlations in back-to-back hadron production in SIDIS

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The Deep Inelastic Scattering (DIS) proved to be a great tool in testing
the theory of strong interactions, which was a major focus in last decades.
Semi-Inclusive DIS (SIDIS), with detection of an additional hadron, allowed first studies of 3D structure of the nucleon, moving the main focus from testing the QCD to understanding of strong interactions and quark-gluon dynamics
to address a number of puzzles accumulated in recent years. Detection of two hadrons in SIDIS, which is even more complicated, provides access to details of quark-gluon interactions inaccessible in single-hadron SIDIS, providing a new avenue to study the complex nucleon structure. Although, the Target Fragmentation Region (TFR) of DIS, when the hadrons are created from the target remnant, carries important information about the spin and flavor structure of
the nucleon, it has not been studied systematically in experiments due to lack of experimental data and theory fundamentals.
In this contribution we present first measurements of single spin asymmetry in semi-inclusive production of protons and charged pions in hard scattering kinematics (Q2 > 1 GeV2, W2 > 4 GeV2), performed by the CLAS collaboration using 5.5 GeV and 5.7 GeV longitudinally polarized electron beams
scattering off the unpolarized liquid-hydrogen target. The large acceptance of the CLAS detector at Jefferson Lab, allowing detection of two hadrons produced back-to-back in the current and target fragmentation regions, provides
a unique possibility to study the nucleon structure in target fragmentation region, and to explore the presence of possible correlations of target and current fragmentation regions.

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