

Implications for Diquark Investigations from the Measurement of Proton Multi-dimensional Multiplicity Ratios

Michael H. Wood
Canisius University
for the CLAS Collaboration

In the non-perturbative regime of Quantum Chromodynamics, the quark and gluon dynamics in a nuclear medium can be studied through the hadronization process. The deep inelastic electron scattering experiments is a clean way to liberate a bound quark from a nucleon in the medium and study the hadronization process. The E02-104 experiment at the Thomas Jefferson National Accelerator Facility used a 5-GeV electron beam incident on nuclei of deuterium, carbon, iron, and lead. One observable to investigate the formation of a color-neutral hadron from a free quark or quarks is the multiplicity ratio (normalized yields of hadrons produced in a heavy nucleus with respect to the yields from hydrogen deuterium). This talk will present results of proton multiplicity ratios in 1D, 2D, and 3D dependencies with respect to Q^2 , ν , z_h , and p_T^2 and discuss possible evidence for direct diquark scattering.

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