

Abstract Submitted
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Measurement of the nuclear transparency in $A(e,e'\pi^+)$ reactions¹

B. CLASIE², D. DUTTA³, H. GAO^{2,3}, X. QIAN³ — Color transparency is a phenomenon predicted by QCD in which hadrons produced at large Q^2 can pass through the nuclear medium with little or no interaction. Results will be presented from E01-107, an experiment that was successfully completed at Hall C at Jefferson Laboratory in 2004, where the pion electroproduction cross section from $Q^2 = 1.1$ to 4.8 (GeV)² was measured. The nuclear transparency is formed by the ratio of (σ_A/σ_H) from the data and (σ_A/σ_H) from a model of electroproduction from nuclei that does not include $\pi - N$ final state interactions. A signature of color transparency is the enhancement of the nuclear transparency at large Q^2 compared with predictions based on Glauber multiple scattering theory. An effect as large as $\approx 40\%$ due to color transparency is predicted in this Q^2 range by some models. This experiment will provide the first nuclear transparency data from $(e,e'\pi^+)$ reactions and seek unambiguous evidence for the existence of the color transparency effect. This work is supported by the US department of Energy under contract number DE-FC02-94ER40818 and DE-FG02-03ER41231 and Duke University.

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