

CEBAF EXPERIMENT 89-032

*Study of Local Properties of Nuclear Matter in Electron-Nucleus and
Photon-Nucleus Interactions with Backward Particle Production
using the CLAS Detector*

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The goals of the proposed experiment are the following:

- 1) Study the space time picture of backward hadron production in deep inelastic electron-nucleus reactions by means of like-particle correlations with small relative momenta. Measurement of A , Q^2 and ν dependence.
- 2) To test the conjecture that in the case of deep-inelastic eA-interactions ($Q^2 > 1 \text{ GeV}^2$, $\nu > 2 \text{ GeV}$) with light nuclei ($A < 20$) all secondary hadrons emitted backward are generated in only one local interaction inside the nucleus.
- 3) To investigate the nature of these local interactions (short-range few-nucleon correlations, virtual multi-quark bags and generation of droplets of quark-gluon plasma).
- 4) To study the properties (spatial extension, density, structure functions and form factors) of these objects, and how these properties depend on their baryon charge.

The study of these questions encompasses only the study of the properties of nuclear matter, but is also closely connected to the most pressing problems of modern QCD such as hadronization, confinement and generation of quark-gluon plasma.