

Searching for Color Transparency effects at 22 GeV

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Searching for the onset of Color Transparency (CT) is a vibrant experimental effort to observe hadrons in a small color-neutral transverse size configuration in the nucleus. The observation of the onset of CT lies at the intersections between the quark-gluon degrees of freedom and the nucleonic descriptions of nuclei. CT is fundamentally predicted by perturbative quantum chromodynamics and is expected to be observable in exclusive scattering as a reduction of final state interactions (FSI) of the point-like hadron with the nuclear medium. Experimentally, this would yield a rise in the measured transparency of the point-like hadron with increasing four-momentum transferred.

Recent experiments in the Jefferson Lab 12 GeV program have explored the onset of CT for protons in Hall C with a null observation, and the analysis of CT effects in rho-mesons in the Hall B CLAS12 detector is currently underway. Near-term future experiments in the 12 GeV program will extend the Q^2 range of the transparency measurements of pion electroproduction in Hall C, and another experiment will seek to enhance the signal for observing CT for protons in Hall C by measuring protons from rescattering in deuterium.

A 22 GeV upgrade at Jefferson Lab would enable improved precision and higher accessible Q^2 for extending the above-mentioned experiments in Halls B and C examining the CT in rho-mesons, pions, and protons with the current experimental equipment. This talk will discuss these measurements and will explore other experimental prospects to search for the CT effects at 22 GeV.

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