

Investigating Hadronization Mechanisms via Lambda SIDIS Production off Nuclei

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Abstract

The confinement of quarks inside hadrons is a remarkable feature of quantum chromodynamics (QCD), and understanding its dynamics is a prime focus of modern nuclear physics. One way to investigate confinement dynamics is through hadronization processes within atomic nuclei in which medium-stimulated effects such as hadron attenuation and transverse momentum broadening can be studied, revealing critical information about the hadronization time-distance scales. In this talk, I will report on the recently conducted color propagation and hadron formation studies in Hall B at Jefferson Lab using the CLAS12 detector and a dual-target setup consisting of various solid foils, such as carbon, aluminum, copper, tin, and lead, alongside a liquid deuterium target mounted in series in the beamline. I will also highlight ongoing analysis efforts to extract the first preliminary results of my Ph.D. project related to studying the Semi-Inclusive Deep Inelastic Scattering of Λ ($1115.7 \text{ MeV}/c^2$) hyperon off nuclei, with broad kinematic coverage allowing access to its production in both forward and target fragmentation regions.

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