8th International Conference on High Energy Physics in the LHC Era

Contribution ID: 432

Type: parallel

Transverse Momentum Broadening in Nuclear Media at Jefferson Lab's CLAS

Thursday 12 January 2023 17:20 (20 minutes)

Transverse momentum broadening is one of the observables measured to study the hadronization process. This process is directly related to the space-time development of a deconfined quark in the nuclear medium before it evolves into a hadron [1, 2, 3]. I'll show the preliminary results for the first experimental measurements of the transverse momentum broadening for positive pions, produced by lepton-nucleon deep inelastic scattering, in carbon, iron, and lead targets at Jefferson Lab's CLAS detector with a 5.014GeV unpolarized electron beam. We used the particle identification scheme developed during the charged pions'multiplicity ratio analysis measurements [4]. In addition, we applied detector acceptance and radiative corrections.

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[2] B. Z. Kopeliovich et al. "Nuclear hadronization: Within or without?"In: Nucl. Phys. A 740 (2004), pp. 211–245. doi: 10.1016/j.nuclphysa.2004.04.110. arXiv: hep-ph/0311220.

[3] S. Domdey et al. "Transverse Momentum Broadening in Semi-inclusive DIS on Nuclei". In: Nucl. Phys. A825 (2009), pp. 200–211. doi:10.1016/j.nuclphysa.2009.04.009. arXiv: 0812.2838 [hep-ph].

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Session Classification: Parallel Session H

Track Classification: Nuclear Physics