

Isolated meson electroproduction at high transverse momentum with 22 GeV electrons

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With 22 GeV electrons striking a fixed proton or nuclear target, there is a regime where the highest momentum pion or rho meson electroproduction proceeds by a perturbatively calculable process. The process is not the leading twist fragmentation one but rather a higher twist process that produces kinematically isolated mesons. Our calculations demonstrate, in particular, that an energy upgrade from 12 GeV to 22 GeV in a high-luminosity experimental setup, as may be expected at JLab, will significantly broaden the kinematic region for the perturbative QCD mechanism of meson production. This semiexclusive data can teach us more about parton distribution functions of the target at high Bjorken x and about the meson distribution amplitudes. In addition, there is a connection to generalized parton distribution calculations of exclusive processes in that the perturbative kernel is the same.

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