

Probing nucleon structure with meson electro-production in Hall C

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Meson electro-production is used in Hall C at Jefferson Lab to probe nucleon and baryon structure. Measurements of exclusive pion electroproduction suggest the validity of the factorization of the process into hard and soft pieces at relatively low momentum transfers. This study will be continued with pion- and kaon-electroproduction measurements after the 12 GeV JLab upgrade.¹ Hints of color transparency with pion production in nuclei also suggest the validity of this factorizability, necessary to access Generalized Parton Distributions.² Exclusive electroproduction of neutral pions and η mesons are also used to study the Δ and S_{11} resonances at high momentum transfer.³ The onset of quark-hadron duality has been observed in semi-inclusive pion electroproduction, suggesting that the $p/d(e, e'\pi^\pm)X$ reactions can be used to probe nucleon structure, particularly the transverse momentum distributions of quarks.

[1] Jefferson Lab proposals E12-07-105 and E12-09-011.

[2] B. Clasie *et al.*, Phys. Rev. Lett. **99**, 242502 (2007).

[3] M. M. Dalton *et al.*, Phys. Rev. C. **80**, 015205 (2009), A. N. Villano *et al.*, Phys. Rev. C. **80**, 035203 (2009).

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