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Probing the Deuteron Wave Function Using High Q^2 d(e,e'p)n Measurements[1]

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As the only bound nuclear two-body system, the deuteron occupies a very special place in nuclear physics. Its wave function can be calculated with very high accuracy and as a consequence a wide variety of observables can be predicted and compared to increasingly precise experimental results. The exclusive electro-disintegration of the deuteron provides one of the most direct tests of the deuteron wave function provided that other contributions to the cross section such as final state interactions (FSI), meson exchange currents (MEC) and isobar configuration (IC) are suppressed. Recent experiments at Jefferson Lab at $Q^2 > 2$ (GeV/c)^2 demonstrated the existence of kinematic regions where FSI, MEC and IC are indeed suppressed. The measured cross sections can be successfully described by Eikonal based models predicting strongly anisotropic FSI contributions. An overview of experimental results will be presented as well as first results of a d(e,e'p)n measurement in Hall C at $Q^2 = 4.5 \pm 0.5$ (GeV/c)^2 where bound nucleon momenta up to a 1 GeV/c have been probed. At higher bound nucleon momenta significant discrepancies between modern calculations and the experimental data were observed.

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