

Deuteron Electro-Disintegration at Very High Missing Momenta

PR10-003

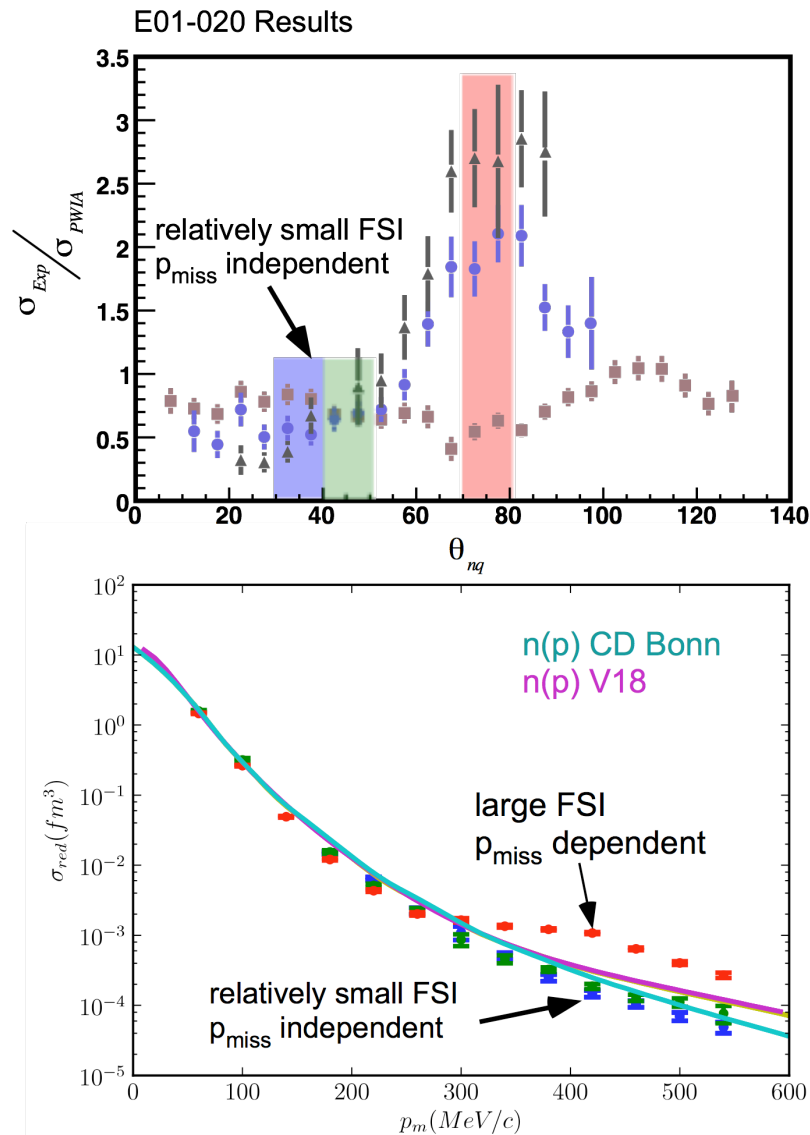
Hall C Collaboration Experiment

- Probe two nucleon dynamics at short space-time distances
- Repulsive core of NN interaction becomes dominant
- Prototype for short range correlation (SRC)
- DIS at high Q^2 and small x and J/Ψ production are sensitive to Deuteron wave function at small distances.

- Explore a new kinematical region of the 2-nucleon system
- No Deuteron data exist at these kinematics!
- SRC studies cover similar region on missing momenta
e.g. experiment E07-006 needs deuteron data for interpretation

- Determine cross sections at missing momenta up to 1 GeV/c
- Measure at well defined kinematic settings
- Selected kinematics to minimize contributions from FSI
- Selected kinematics to minimize effects of delta excitation

FSI Suppression



- GEA confirmed in previous experiments
- high Q^2 opens window with small FSI

Experimental Parameters

Beam:

Energy: 11 GeV

Current: $80\mu A$

Electron arm *fixed* at:

SHMS at $p_{cen} = 9.32$ GeV/c

$\theta_e = 11.68^\circ$

$Q^2 = 4.25$ (GeV/c) 2

$x = 1.35$

Vary proton arm to measure :

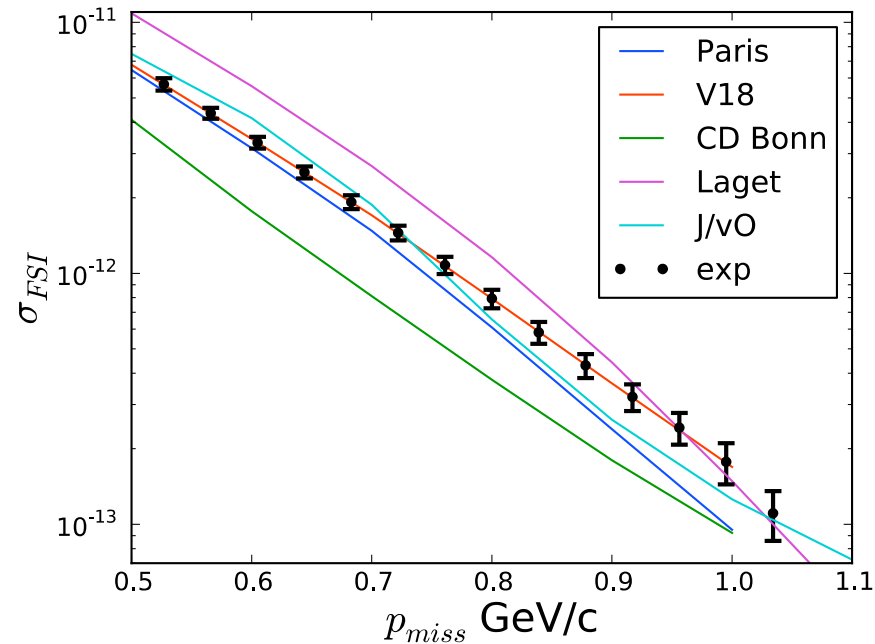
$p_m = 0.5, 0.6, 0.7, 0.8, 0.9, 1.0$ GeV/c

HMS $1.96 \leq p_{cen} \leq 2.3$ geV/c

Angles: $63.5^\circ \geq \theta_p \geq 53.1$

Target: 15 cm LHD

Expected Results



- ✓ Measured cross sections for p_m up to 1 GeV/c
- ✓ Errors: dominated by statistics: 7% - 20%
- ✓ Estimated systematic error $\approx 5\%$
- ✓ Very good theoretical support available
- ✓ JLAB uniquely suited for high p_m study
- ✓ Good coincidence commissioning experiment
- ✓ request 21 days of beam time