PHYSICS/MCC EXPERIMENT PLANNER

Measurement of Single Target-Spin Asymmetry in Semi-Inclusive Charged Pion Electroproduction on a Transversely Polarized ^{3}He Target

Experiment #	Hall	Start/Finish Dates		Total Beam Hours
E06-010 / E07-013	**A**	Start: 10/23/08	Finish: 2/5/09	
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Operations Representative: **L. Richardson**			Phone:**7675** Pager:**584-7675**	E-mail:**lrichard@jlab.org** Office:**TR53B**
Standard Meeting Times: Tuesday 1:30 pm/ Daily at 4pm on 2nd floor of Counting House Special Meetings/Presentations:			Meeting Location: CC L104/ Counting House 2nd Floor	

Brief Description of Experiment (as relevant to Operations): The goal of this experiment is to provide the first measurement on the neutron transversity, complementary to the HERMES measurement on proton and the COMPASS measurement on deuteron. This experiment focuses on the valence quark region, x= 0.13~0.41, at Q^2 = 1.31 ~ 3.10 GeV^2. This kinematics is comparable to the HERMES measurement. The variation of single spin asymmetry as a function of Collins angle and Sivers angle will provide a clear separation between the two competing mechanisms- the chiral-even Sivers effect and the chiral-odd Collins effect. This is a crucial step toward the extraction of the quark transversity distributions in semi-inclusive deep-inelastic scattering. Data from this experiment, when combined with HERMES proton data and COMPASS deuteron data, will provide powerful constraints on the transversity distributions and Sivers functions for both u-quark and d-quark in the valence region.

Applicable Reading Material:

Beam Requirements:

	1.233 GeV (1-pass)	2.400 GeV (2-pass)	? GeV (3-pass)	4.734 GeV (4-pass)	5.90 GeV (5-pass)
Standard Energy (pass)					
Nonstandard Energy (specify)	**1.233GeV**	**2.400GeV**			**5.90GeV**
Current(s) @ Given Energy	**0 to 15μA for ^{3}He, up to 100uA for solid targets**	**0 to 15μA for ^{3}He, up to 100uA for solid targets**			**0 to 15μA for ^{3}He, up to 100uA for solid targets**
# of Hours at Each Energy/Current					
Polarization (%)	**85**	**n/a**			**85**
ΔE/E	**<5X10^{-4}**	**<5X10^{-4}**			**<5X10^{-4}**
Beam Energy Stability	**<5X10^{-4}**	**<5X10^{-4}**			**<5X10^{-4}**
Beam Size (horizontal)	**<200μ />100**	**<200μ />100**			**<200μ />100**
Beam Size (vertical)	**<200μ />100**	**<200μ />100**			**<200μ />100**
Beam Size Stability	**standard**	**standard**			
Target Types	^{3}He, ^{12}C, ^{2}H, ^{2}N, BeO, Empty, ^{12}C with hole	^{3}He, ^{12}C, ^{2}H, ^{2}N, BeO, Empty, ^{12}C with hole			^{3}He, ^{12}C, ^{2}H, ^{2}N, BeO, Empty, ^{12}C with hole

Special Concerns: 30 second ramp rate to get to desired current