

Proposal Number: 09-004

Hall: C

Title: Precise Measurement of the π^+/π^- Ratios in Semi-Inclusive Deep Inelastic Scattering Part II: Unraveling the Flavor Dependence of the EMC effect

Contact person: D. Dutta (*d.dutta@msstate.edu*)

Beam time request:

Days requested for approval:	24 days
Tune up included in beam line request:	No

Beam characteristics:

Energy:	11 GeV
Current:	15-50 microA
Polarization:	no

Targets:

Nuclei:	1H (10cm), 2H (10cm), dummy, Au (6%)
Rastering:	Yes
Polarized:	No

Spectrometers:

HMS	Yes
SHMS	Yes
Other (BigCal, etc.):	none

Special requirements/requests:

none

Technical Comments:

The experiment measures the double ratio of π^+/π^- yields in gold to π^+/π^- yields in deuterium to search for evidence of the flavor dependence in the EMC effect. The SHMS will be used for e^- detection and the HMS will detect the coincident π^+ or π^- . The angle and momentum ranges needed by the experiment are consistent with HMS-SHMS angle and momentum ranges. The opening angle between the HMS-SHMS is never smaller than the minimum. Singles rates are high in both the HMS and SHMS so PID is important and random rates are high. Both these issues have been addressed. Since the ratio of π^+/π^- rates is about 2, they plan are running at half the current for the π^+ running so that the rates in the focal plane will be similar for π^+ and π^- which reduces the difference in tracking efficiency. The proposal clear states how the PID will be accomplished. Since the real to random ratio can be near 1 at some kinematics, the running time has been extended at those points so that the required statistical precision after random subtraction can be obtained.

Much of the deuterium running is at kinematics which overlap with PR09-002 and so if both experiments are approved then the combined running time reduces by 5.5 days.