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Proposal Number: P04-001 Hall: C

Title: Measurement of F_2 and $R = s_L/s_T$ on Nuclear Targets ir

Contact person: Arie Bodek (Rochester) and Thia Keppel (Hampton Univ

Beam time request:

Days requested for approval: 5 days

Tune up included in beam line request: no

Beam characteristics:

Energy: 1.18,2.29,3.41,4.52,5.64 GeV

Current: 30 - 80 mA

Polarization: no

Targets:

Nuclei: 4 cm LH2,LD2, A1(MT),

C,Quartz,Si,Ca,Fe,Cu

Rastering: nominal

Polarized: no

Spectrometers:

HMS: single arm mode

SOS: single arm mode

Special requirements/requests: none

Technical Comments:

1) The experiment is technically doable, as proven by the previous E94-110 experimen

2) The experiment is an add-on to approved experiment E02-109 that performs similar

3) If the experiment would be scheduled separately from E02-109, the overhead for th

4) As this is an L/T separation, many beam pass changes are required, and an additio

5) The experiment assumes some unconventional targets such as Si, Ca, and Quartz. Th

6) The estimated uncertainty in D R_A is not given, but is presumably similar as the

7) The experiment does include some overhead for investigation of charge symmetric b

8) Even though only 5 days are requested, the experiment may have a large radiation

9) It is not clear which solid target ladder the proponents plan to use. A lot of ta

10) A corrected beam requirements list is needed.

Proposal Number: P04-003 **Hall: C**

Title: The Neutron Electric Form Factor at Higher Q^2 up to 4.0 $(GeV/c)^2$ from the Reaction $^2H(e,e?n)^1H$ via Recoil Polarimetry

Contact person: Richard Madey (Kent State University & JLab)

Beam time request:

Days requested for approval: 37 days

Tune up included in beam line request: yes

Beam characteristics:

Energy: 3.68, 5.61 GeV

Current: 1-90 mA

Polarization: 80%

Targets:

Nuclei: 15 cm LH2, LD2, Al(MT), Fe

Rastering: nominal

Polarized: no

Spectrometers:

HMS: yes

SOS: no

Special requirements/requests: This is a large installation experiment requiring the installation of a dedicated neutron polarimeter.

Technical Comments:

1) This is a major installation experiment asking for a lot of floor time. The inst

2) The beam time request assumes 80% beam polarization. If the more commonly achiev

3) The experimental technique is both feasible and elegant. Very few potential syste

4) The background simulations are some of the most thorough done for any JLab experi

5) The names of collaboration members found on the proposal were taken from E93-038.

6) Are the detectors and electronics used in E93-038 available for this new experiment? Do the

polarimeter and shadow shield support structures still exist? Will they or their designs be suitable for this experiment, or is significant time and effort expected from the Hall C engineering and design staff?

7) The n-g tof difference is about 1/3 what it was in the old experiment. Will the p^0 peak in the D TOF spectra still be resolved? In the 2.5m path length of the polarimeter, these tof differences will be sub-nanosecond in the new experiment. The separation of n-p from n-C in the polarimeter will also worsen. What consequences will this have on the measurement? What consequences will the poorer neutron energy resolution have on the experiment?

8) An experimental layout figure should be provided checking possible interference with G0 in its back-angle configuration and interference between the HMS and the shield house or shadow shield support structure.

9) The one day overhead request leaves less than one minute (48 seconds) on average for each target/magnet change or run start/stop. Hence, the overhead is largely underestimated.

10) Would the use of a sub-harmonic microstructure of the beam benefit these or higher Q^2 measurements?

Proposal Number: P04-004 **Hall: C**

Title: Search for Exotic Pentaquark q^{++}, q^{*++} and q^{+} in Hall C

Contact person: Haiyan Gao (Duke University)

Beam time request:

Days requested for approval: 18 days

Tune up included in beam line request: no

Beam characteristics:

Energy: 3.17 GeV

Current: 8-30 mA

Polarization: no

Targets:

Nuclei: 4 cm LH2, LD2

Rastering: nominal

Polarized: no

Spectrometers:

HMS: no

SOS: yes

Special requirements/requests: This is a large installation experiment requiring the installation of the HKS and a neutron detector.

Technical Comments:

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1) The experiment cannot use the HKS set up without extensive modification.  There a
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2) This is a major installation experiment which requires the HKS and beam splitter
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3) This proposal requires that the SOS and HKS be placed close to the beam line. Bo

4) The HKS shielding hut is designed for far lower luminosities than assumed in this

5) With the neutron array moved out-of-plane in order to access smaller laboratory s

6) The iterative procedure as described in the Simulations chapter could bias result

7) The proposal lacks discussion of the neutron detection for the q^+ part of the exp

8) The real to random rate for neutron detection is not given.

9) A precise definition of and specifications for the neutron detector are needed.

10) There are discrepancies between the beam requirement list and the proposal text, e.g. in beam current on the LH2 target.

Proposal Number: P04-008 **Hall: C**

Title: Measurements of Target Single-Spin Asymmetry in Elastic ep scattering

Contact person: Xiaodong Jiang (Rutgers University)

Beam time request:

Days requested for approval: 20 days

Tune up included in beam line request: partial

Beam characteristics:

Energy: 4.8 GeV

Current: 50-100 nA

Polarization: no

Targets:

Nuclei: H,14N,He,Al,Cu,C

Rastering: PT raster

Polarized: yes

Spectrometers:

HMS: yes

SOS: no

Special requirements/requests: This is a Large Installation experiment, requiring installation of a substantially modified polarized target, a new beam line chicane or beam dump, and several new calorimeter detectors

Technical Comments:

1) This experiment uses "new" detector systems consisting of calorimeters previously

2) This is a large installation experiment. Installation time has not been included,

3) Strong technical support is assumed from the JLab Target Group for the implementa

4) No single group responsibility is assigned to the Michigan magnet refurbishing (i

5) A detailed qualification is needed of what is available, what will be new, and what work is needed for this target system.

6) The collaboration is proposing to use a conventional magnet in their polarized ta

7) Electronics for the new detectors will be almost entirely in the Hall. Experience

8) Backgrounds are investigated for electron, positron, and photon rates for this ex

9) Background estimates should incorporate general room background coming from the H

10) As noted in the proposal, new power, control, and monitoring devices will be req

11) The 5 and 10 degree detectors are stated as necessary for luminosity monitors. I

12) It is noted that accurate beam charge monitoring is of use to the experiment, ho

13) The small angle detectors won't have the advantage of simultaneous e+p and p+e m

14) Infrequent reversals mean that normalized yields will be compared which are take

15) Relativistic proton detection in Lead glass is possible by Cerenkov light. Howev

16) As proposed, an energy calibration is needed i) for electron W reconstruction an

17) The expected W resolution varies with kinematic setting but is very poor. Assumi

Proposal Number: P04-009 **Hall: C**

Title: Measurement of the Born-Forbidden Recoil Proton Normal Polarization in Electron-Proton Elastic Scattering

Contact person: David Mack (JLab)

Beam time request:

Days requested for approval: 27 days

Tune up included in beam line request: no

Beam characteristics:

Energy: 0.57, 0.85, 1.0, 2.0, 3.0 GeV

Current: 75 mA

Polarization: 75%

Targets:

Nuclei: 4 cm LH2, Al(MT)

Rastering: nominal

Polarized: no

Spectrometers:

HMS: yes

SOS: no

Special requirements/requests: This is a large installation experiment requiring the installation of a superconducting solenoid and new detector systems.

Technical Comments:

1) This is a major installation class experiment requiring the procurement, refurbishment and modification of a medium sized surplus superconducting solenoid magnet. The magnet refurbishment needs to include a conversion from a persistent mode to a continuously powered mode of operation in order to allow for the required frequent changes in field strength. There are two identical surplus solenoids available so confidence should be high that at least one can be made to operate as required for the experiment. The experiment proposes a movable support structure which will travel on the SOS rails. This approach is probably not cost effective for a single run experiment. The collaboration might consider roller technology instead. The experiment plans to employ the standard HMS setup as the electron arm.

2) The experiment requires 5 different energies (3 of these are at a fixed linac energy). The lowest energy of 570 MeV may be invasive to experimental running in the other two Halls.

3) Setup time for checkout and Moeller measurements is not included and is estimated to be 1 day total. Commissioning time for the new detector system is not included.

4) The cryo-target and beam current requirements are straightforward. Specifically, a 4cm flask with 75 microamperes of normal microstructure polarized beam.

`5) The most critical aspect for this experiment seems to lie in the feasibility of t`

`6) It is unclear what the singles rate on the wire chambers will be from high energy`

Proposal Number: P04-013 **Hall: C**

Title: Measurement of the Nuclear Dependence of the EMC Effect at Large x

Contact person: David Gaskell (JLab)

Beam time request:

Days requested for approval: 8 days

Tune up included in beam line request: yes

Beam characteristics:

Energy: 6.0 GeV

Current: 20 - 80 mA

Polarization: no

Targets:

Nuclei: 4 cm LH2, LD2, Al(MT), 7 Li 9Be, 12C,27Al, 40Ca, Cu, Ag,Au

Rastering: nominal

Polarized: no

Spectrometers:

HMS: single arm mode

SOS: single arm mode

Special requirements/requests: 7Li target on cryo ladder.

Technical Comments:

1) Based on previous experience (E89-009 and E99-118) this experiment is certainly d

2) The estimated systematic uncertainties for the point-to-point systematics are sma

3) There are lots of solid targets, two of which require special handling: Li and Ca

4) The experiment does not seem particularly sensitive to the beam energy and may still comfortably be run at lower energies.

5) The collaboration should consider including additional measurements on hydrogen.

6) It is not clear what target ladder the proposal requires. There is enough space on the cryo target and solid target ladder combined, but the cryo target ladder does not allow for rotation.

Proposal Number: P04-014 **Hall: C**

Title: Measurement of GEp/GMp using elastic polarized p(e,e?)p up to Q^2=3.50 $(GeV/c)^2$

Contact person: Xiaochao Zheng (Argonne National Lab)

Beam time request:

Days requested for approval: 17 days

Tune up included in beam line request: yes

Beam characteristics:

Energy: 3.6, 6 GeV

Current: 85-200 nA

Polarization: 80%

Targets:

Nuclei: NH3

Rastering: PT raster

Polarized: yes

Spectrometers:

HMS: yes

SOS: no

Special requirements/requests: This is a Large Installation experiment, requiring installation of the Polarized Target and Beam Line Chicane

Technical Comments:

1) This is a large installation experiment, albeit a standard one requiring the polarized target and associated beam line chicane. Installation time has not been included, and is estimated to be 2-3 months. Teardown is estimated to be one month.

2) The beam time request assumes 80% beam polarization. If the more commonly achiev

3) Strong technical support is assumed from the JLab Target Group for the installation, calibration, and operation of the polarized target. We do note that this may be alleviated by the strong involvement on this proposal by the UVa group.

4) The experiment will require a low current dump in the Hall for the non-parallel field measurements. This technique has before been used for the E93-026 experiment.

5) There is no basis for the claimed 0.3 mrad absolute angle accuracy of the HMS (wi

6) No details were given of how the target spin direction was previously determined

7) Careful alignment of the target will be needed to get the beam through the target

8) The approved E01-109 GEp-III experiment already provides a sensitive test to systematic uncertainties due to spin precession in the Hall A apparatus. Does this experiment bring more to this problem?

Proposal Number: P04-019 **Hall: C**

Title: Measurement of the Two-Photon Exchange Contribution in ep Elastic Scattering Using Recoil Polarization

Contact person: Riad Suleiman (MIT)

Beam time request:

Days requested for approval: 25 days

Tune up included in beam line request: no

Beam characteristics:

Energy: 2.26, 2.84, 3.77, 4.70 GeV

Current: 75 mA

Polarization: 80%

Targets:

Nuclei: 4 cm LH2

Rastering: nominal

Polarized: no

Spectrometers:

HMS: yes

SOS: no

Special requirements/requests: This is a large installation experiment requiring the installation of the large electron calorimeter currently constructed for the E01-109 GEp-III experiment in Hall C.

Technical Comments:

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1) The beam time request assumes 80% beam polarization.  If the more commonly achiev
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2) Although the proposal asks for specific energies, there appears from kinematics t
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3) The beam time request assumes that the experiment can be scheduled to run right a
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4) No information on background rates has been provided, of special relevance for an
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5) The experiment relies on use of the BigCal to ?reduce background by ensuring the exclusivity of the reaction?. No quantitative statement is made regarding either what level of background reduction is necessary, or what level can be achieved by using BigCal in coincidence with the HMS.

6) There is no discussion about backgrounds from the target cell walls. Given the rather small magnitude of P_y, this could be important.

7) One planned method of testing the false asymmetries in the recoil polarimeter relies on using the exclusive $H(e,e?p^+)$ process. It is not clear that the BigCal+HMS combination will have the missing-mass resolution to cleanly identify this process. Is the method valid if one includes backgrounds from associated Delta production and/or semi-inclusive production? Could p^+?s from exclusive r production be a background?

Proposal Number: P04-020 **Hall: C**

Title: A measurement of two-photon effects in unpolarized electron-proton scattering

Contact person: John Arrington (Argonne National Lab)

Beam time request:

Days requested for approval: 9 days

Tune up included in beam line request: yes

Beam characteristics:

Energy: 1.1, 2.2, 3.3, 4.4, 5.5 GeV

Current: 35-70 mA

Polarization: no

Targets:

Nuclei: 4 cm LH2, Al(MT)

Rastering: nominal

Polarized: no

Spectrometers:

HMS: single arm mode

SOS: single arm mode

Special requirements/requests: Energies chosen compatible with Hall A E02-010 experiment.

Technical Comments:

1) Precise choice of beam energies requested in this proposal is not clear. The bea

2) To control the luminosity at 70 μA, the intrinsic beam spot size should be made a

3) Current understanding of the electronic dead time is inconsistent with the 0.1% u

4) It would be nice to see predicted elastic signal and backgrounds assuming HMS res

5) Precision measurements may have to deal with frequent beam trips. Fortunately, da