Hall C User's Meeting

January 18-19, 2008

Hall C Research Program

- Have been running experiments since November 1995
- 755 PAC Days run, or 36 experiments (62 PAC days/year)
- 206 (+Qweak) PAC Days in queue, or 9 experiments

  (ALL large-scale installation experiments)

  (Backlog: 2.9 Years, assuming 70 PAC days/year)
- Almost 10 Large Installations to date: t_{20}, G_E^n-98, HNSS, G_E^n-00, G_E^n-01, G0 (x2), HKS, G0-Backward, GEP

- 90+ Ph.D. Subjects, 66 Ph.D.'s awarded (6 in 2007)
- 54 refereed publications to date (26 PRL), 4 submitted (not including 9 NIM papers)
- 400+ users representing 20 different countries
- No collaboration, but steering committee to represent user community involved in **diverse** Hall C program dominated by large-installation experiments.

Steering Committee

- Hall C maintains experiment-specific collaborations, with 400+ users from 20 countries
- Hall C Steering Committee with as main tasks
  - Provide effective channel of communication
  - Represent the interests of Hall C users and Hall C
  - Organize annual Hall C physics workshop

- 2003: John Arrington (ANL)
  Donal Day (UVa)
  Joerg Reinhold (FIU)
  Phil Roos (UMd)
- 2004: Betsy Beise (UMd)
  Donal Day (UVa)
  Joerg Reinhold (FIU)
  Wim Van Oers (Manitoba)
- 2005: Betsy Beise (UMd)
  Osamu Hashimoto (Tohoku)
  Allena Opper (Ohio)
  Wim Van Oers (Manitoba)
- 2006: Osamu Hashimoto (Tohoku)
  Roy Holt (ANL)
  Garth Huber (Regina)
  Allena Opper (GWU)
- 2007: Garth Huber (Regina)
  Samuel Danagoulian (NCA&T)
  Haiyan Gao (Duke)
  Julie Roche (Ohio)
- 2008: Julie Roche (Ohio)
  Abdellah Ahmidouch (NCA&T)
  Hamlet Mkrtchyan (Yerevan)
  Haiyan Gao (Duke)

Staff

- Technical
  - Walter Kellner, Andy Kenyon, Larry Carraway, Jessica Carucci, Matthew Lumanog, Charles Lassiter, Jerry Nines
- Engineering/Design
  - Paul Brindza, Mike Fowler, Stephen Furches, Steve Lassiter, Paulo Medeiros, Bert Metzger, Eric Sun, Dan Young
- Experimental Technical
  - Bill Vulcan, Joe Beaufait
- Admin support
  - Erica Jones
- New Postsdocs
  - Silviu Covrig
  - Peter Monaghan (HU)
- New Joint Appointment
  - Michael Kohl (HU)

2007 Publications

E00-008	Onset of Quark-Hadron Duality in Pion Electroproduction	PRL 98, 022001
E01-006	Proton Spin Structure in the Resonance Region	PRL 98, 132003
E99-118	L-T Separations of Structure Functions at Low Q^2 for H & D	PRL 98, 142301
E93-021	Determination of the Pion Charge Form Factor for Q^2=0.60-1.60 $(GeV/c)^2$	PRC 75, 055205
E99-118	Transverse Beam Spin Asymmetries in Forward-Angle Elastic Electron-Proton Scattering	PRL 99, 092301
	Testing the Standard Model by Precision Measurement of the Weak Charges of Quarks	PRL 99, 122003
E01-107	Measurement of Nuclear Transparency for the A(e, e'π^+) Reaction	PRL 99, 242502

Submissions

E01-107	Scaling Study of the Pion Electroproduction Cross Section and Pion Form Factor	arXiv:0707.1794
E01-108	Transverse Momentum Dependence of Semi-Inclusive Pion Production	arXiv:0709.3020
	Empirical Fit to Inelastic Electron-Deuteron and Electron-Neutron Resonance Region Transverse Cross Sections	arXiv:0711.0159
	Empirical Fit to Precision Inclusive Electron-Proton Cross Sections in the Resonance Region	arXiv:0712.3731
E00-006	G0 Electronics and data acquisition (forward angle meas.)	NIM in press

2008 possible submissions: EMCx2, x>1, Baryon x 2, G0 NIM, G0 Backward?, Hypernuclear?, HKS NIM?

Experiments completed in Hall C in last year

Exp	Title	Spokespersons
E04-115	G0 Backward Angle Measurement	D. Beck
E04-101	Parity-Violating Asymmetry in the N-Δ Region	N. Simicevic and S. Wells
E04-001	Measurements of F_2 and R on Nuclear Targets	A. Bodek and C. Keppel
E06-009	Measurement of $R=\sigma_L/\sigma_T$ on Deuterium in the Nucleon Resonance Region and Beyond	M. Christy and C. Keppel
E05-017	Measurement of Two-Photon Exchange in Unpolarized Elastic e-p Scattering	J. Arrington

- G0 Backward ran until March, 2007
- In April 2007, restored Hall C to base equipment configuration to run E04-001, E06-009 and E05-017 until July 2007

Current and near-term running

Exp	Title	Spokespersons
E04-019	A Measurement of the Two-Photon Exchange Contribution in e-p Elastic Scattering Using Recoil Polarization	R. Gilman, L. Pentchev, C. Perdrisat, and R. Suleiman
E04-108	Measurement of Gep/GMp up to Q^2 = 9 GeV^2 via Recoil Polarization in Hall C	E. Brash, M, Jones, C. Perdrisat and Vina Pujabi
E07-002	Polarization Transfer in Wide Angle Compton Scattering	B. Wojtsekhowski, A. Nathan and R. Gilman

- E04-019 almost done, E07-002 this month
- E04-108 running Spring 2008

Hall C Infrastructure improvements

- Recent upgrades for current program and 12 GeV readiness
- HMS Upgrade
  - Replaced all tubes+bases, checked light guide joints
  - Control system replacement
    - Modern hardware, PLC's located outside of hall
    - Model for SHMS controls
- New Scattering Chamber and Cryotarget
- New drift chamber gas system
- SOS Restoration
- New magnet power supplies:
  - HKS Splitter PS - 150V, 1125A
  - Qweak main magnet PS. - 170V, 9600A
- Future improvements
  - Beamline upgrade to accommodate Compton and additional Moller quad (for Qweak and 12 GeV)
  - LCW

Budget Impact

- Anticipated Presidents budget of 110M cut by 9M.
- 14M of 12 GeV spending not reduced (by law)
- Hiring freeze for non-12 GeV positions.
- Delay end of Summer down from July 31 to Oct 1 or later (Jan 1, 2009?)
- Reduce Hall budgets
- Hall C
  - Preserve ops to prepare Hall for SANE, HKS, Qweak
  - Reduce visitor/postdoc support
  - Slow capital spending
  - Carefully evaluate capital needs
  - Beg

2008 Shutdown Activities

- Accelerator off June 8 – (Oct 1-Jan1)
- Identifying tasks that can shorten installation times of upcoming experiments or help 12 GeV
- Remove SMS (if not already gone)
- Remove G0 rails
- Extend floor for HES (HKS electron spectrometer)
- Assemble HES Spectrometer
- Partially remove SOS? (Eases truck ramp access during hypernuclear setup)
- Cryo reworking?

Hall C Approved Experiment Summary

Base Equipment Experiments (0 experiments, 0 days):

Large Installation Experiments beyond G0 (10 experiments, 222+ days):

E04-108	Measurement of G_E^p/G_M^p to $Q^2 = 9$ GeV^2	40 days	A
E04-019	Measurement of the Two-Photon Exchange Contribution in e-p Elastic Scattering Using Recoil Polar.	18 days	A-
E07-002	Polarization Transfer in Wide Angle Compton Scattering	3 days	B
E07-003	Spin Asymmetries on the Nucleon Experiment	34 days	A
E04-113	Semi-Inclusive Spin Asymmetries on the Nucleon	25 days	A- (J)
E05-101	Helicity Correlations in Wide-Angle Compton Scattering	14 days	A-
E07-011	A High Precision Measurement of g1d/F1d	8 days	A
E05-008	The Qweak Experiment: A Search for Physics at the TeV Scale via a Meas. of the Proton's Weak Charge	35+ days	A (J)
E04-110	The Neutron Electric Form Factor at $Q^2 = 4.3$ GeV^2 from the D(e,e'n) Reaction via Recoil Polarimetry	25 days	A- (J)
E05-115	Spectroscopic Investigation of Hypernuclei in … (II)	20 days	A-

Color coding indicates experiments using similar apparatus

Now -> 12 GeV Shutdown

Oct 2007-June 8, 2008

E04-019 2γ Exchange in ep Polarization Transfer, E04-108 G_E^p/G_M^p up to $Q^2 = 9$ (GeP-III)

E07-002 Polarization Transfer in Wide-Angle Compton Scattering

Oct 1-Dec 31 2008 or Jan 1-Mar 30 2009

E07-003 - Spin Asymmetries on the Nucleon Experiment

Jan 1-May 30 2009 or Apr 1-July 30 2009 (5 or 4 months)

HES/HKS Installation

June 1-Aug 30 2009 or Aug 1-Oct 31 2009

HES/HKS Run

Sep 1 2009 or Nov 1 2009

Start of Qweak installation

May 1 2012

Shutdown for 12 GeV

Assumptions:

1. SANE, HKS, Qweak run
2. 3 month floor time for HKS and SANE
3. >= 2.5 years for Qweak, which includes
   6 month install, and
   6 month accelerator down

Hall C SHMS Detector Review

Tuesday, Jan 22, CEBAF Center F324

9:00	Charge	Warren Funk (JLab)
9:15	Overview of SHMS detector system, requirements, integration, and schedule	Antje Bruell (JLab)
10:00	Wire Chambers	Eric Christy (Hampton U)
10:20	Hodoscopes	Ioana Niculescu (JMU)
10:40	Break	
11:00	Quartz Detector	Abdellah Ahmidouch (NCA&T)
11:20	Detector Frame for #1-#3	Charles Perdrisat (W&M)
11:40	Noble Gas Cerenkov	Donal Day (UVA)
12:00	Heavy Gas Cerenkov	Garth Huber (U of Regina)
12:20	Lunch	
13:30	Electromagnetic Calorimeter	Hamlet Mkrtchyan (Yerevan)
13:50	Detector Frame for #5-#7	Paul Brindza (JLab)
14:10	Summary	Antje Bruell (JLab)

Discussion Topics

- Nature of Hall C collaboration
  - Pre-pac review of proposals?
  - More formal collaboration, either now or for 12 GeV
  - 12 GeV commissioning collaboration
- Role of steering committee
- Keeping Hall C user community active/engaged through upcoming diverse set of 3 experiments and 12 GeV shutdown
- 6 GeV program publication status, archive/NIM papers