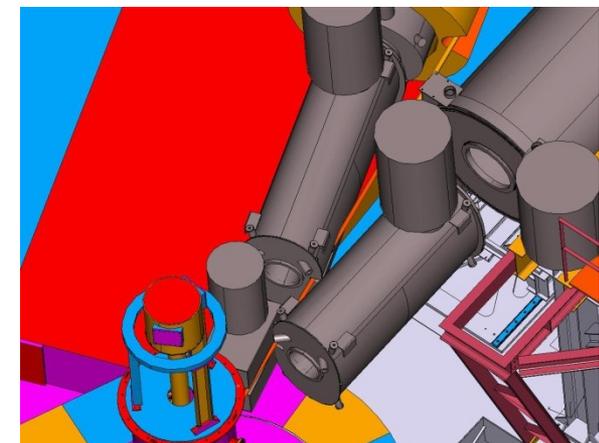


Hall C Summer Workshop

August 4-5, 2008

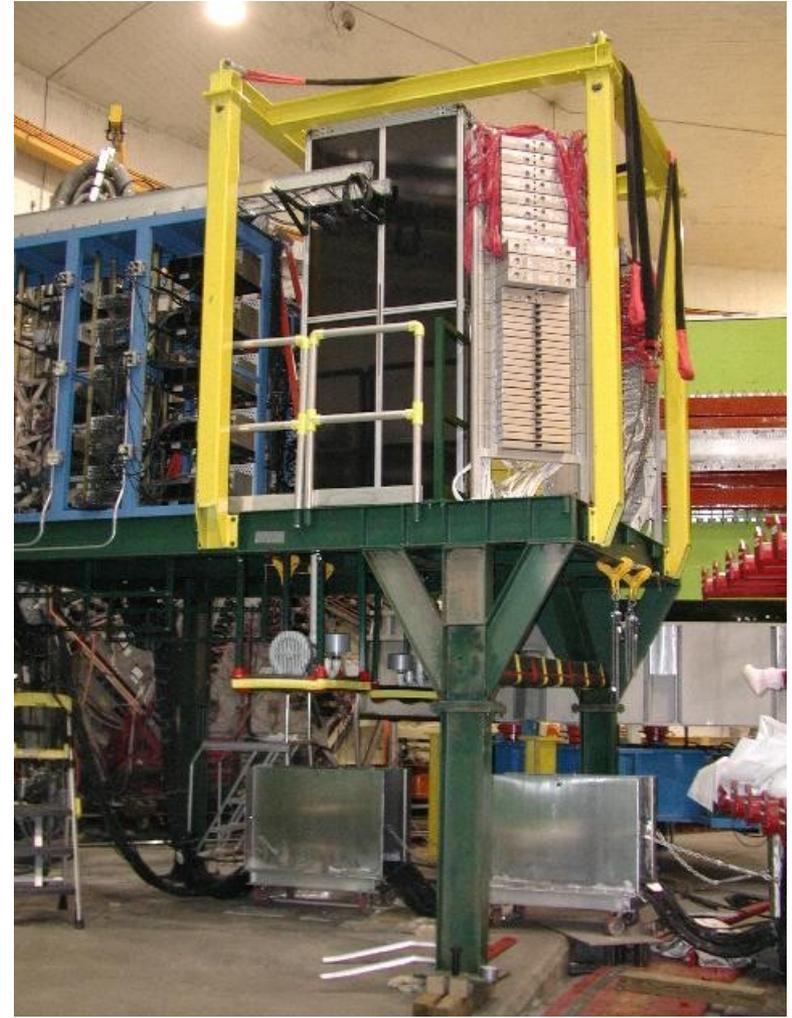
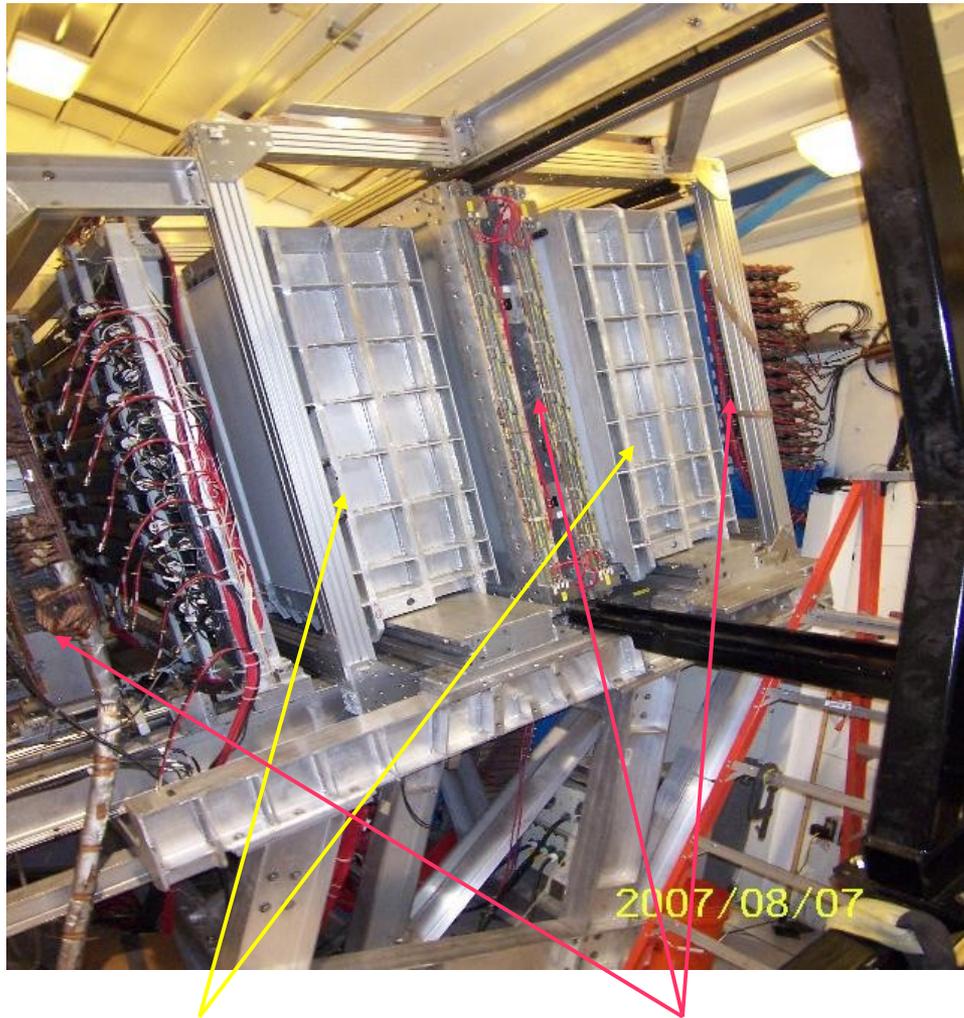


Recently Completed experiments

Exp	Title	Spokespersons
E04-019	Two-Photon exchange in e-p elastic using recoil polarization	R. Gilman, L. Pentchev, C. Perdrisat, R. Suleiman
E07-002	Polarization Transfer in Wide Angle Compton Scattering	R. Gilman, A. Nathan, B. Wojtsekhowski
E04-108	GeP-III: GeP/GmP to $Q^2=9 \text{ GeV}^2$	E. Brash, M. Jones, C. Perdrisat, V. Punjabi

- Bulk of E04-108 (Gep High Q^2) ran April-June 2008
- Lost time in Jan 08 due to leak in dump line exit window
- Running during Feb 08 Hall B extension allowed E07-002 to obtain excellent statistics at slightly lower than desired beam energy

Gep-III Focal Plane Polarimeter, BigCal



CH₂ Analyzer

Chambers

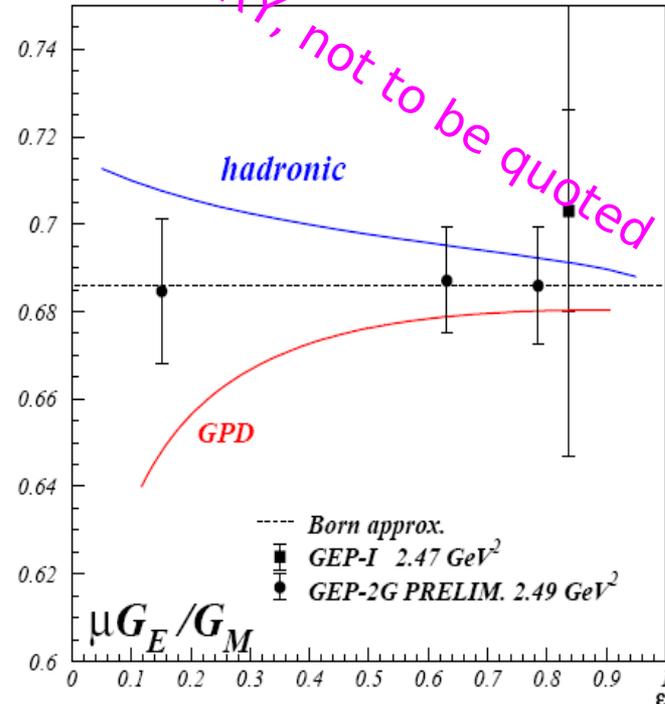
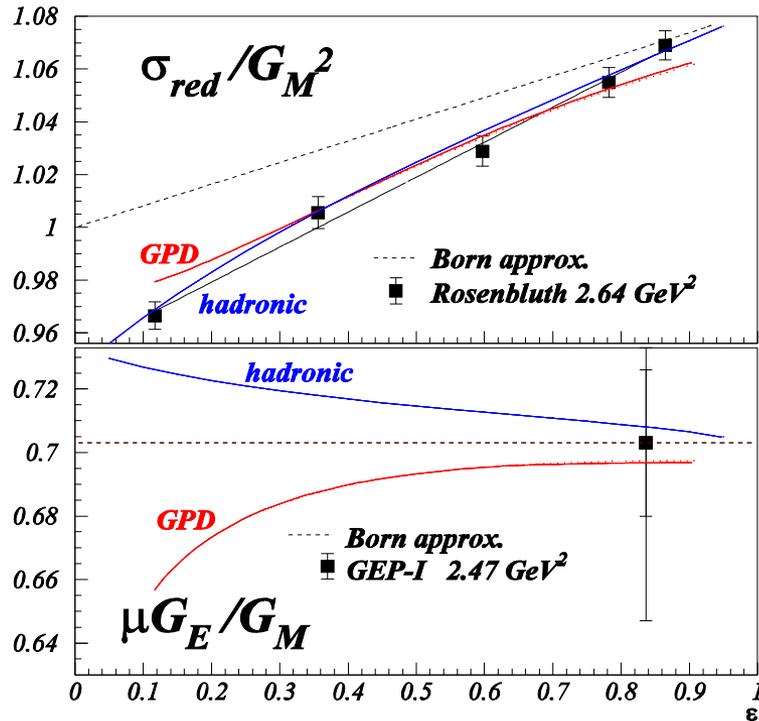
- Measured the transferred polarization component **ratio Pt/PI**, and **separately PI**, in ep elastic for a fixed Q^2 of 2.5 GeV² at three different kinematics (epsilons).
- At fixed Q^2 , proton momentum is fixed, therefore analyzing power A_y and HMS setting (hence spin transport) are the same for the three kinematics. This allowed for a first time to measure **at a percent level** (p.t.p. error) **not only the ratio Pt/PI, but PI as well**.
- Physics goals:

$$\frac{G_E^p(Q^2)}{G_M^p(Q^2)} = -\sqrt{\frac{\tau(1+\varepsilon)}{2\varepsilon}} \frac{P_t}{P_l} \qquad \frac{hA_y P_l}{hP_l^{\text{Born}}} = \frac{hA_y P_l}{h \frac{\sqrt{1-\varepsilon^2}}{1+R^2 \varepsilon/\tau}} = A_y$$

Deviations from constant indicate contributions beyond Born approximation.

Two-Gamma 04-019

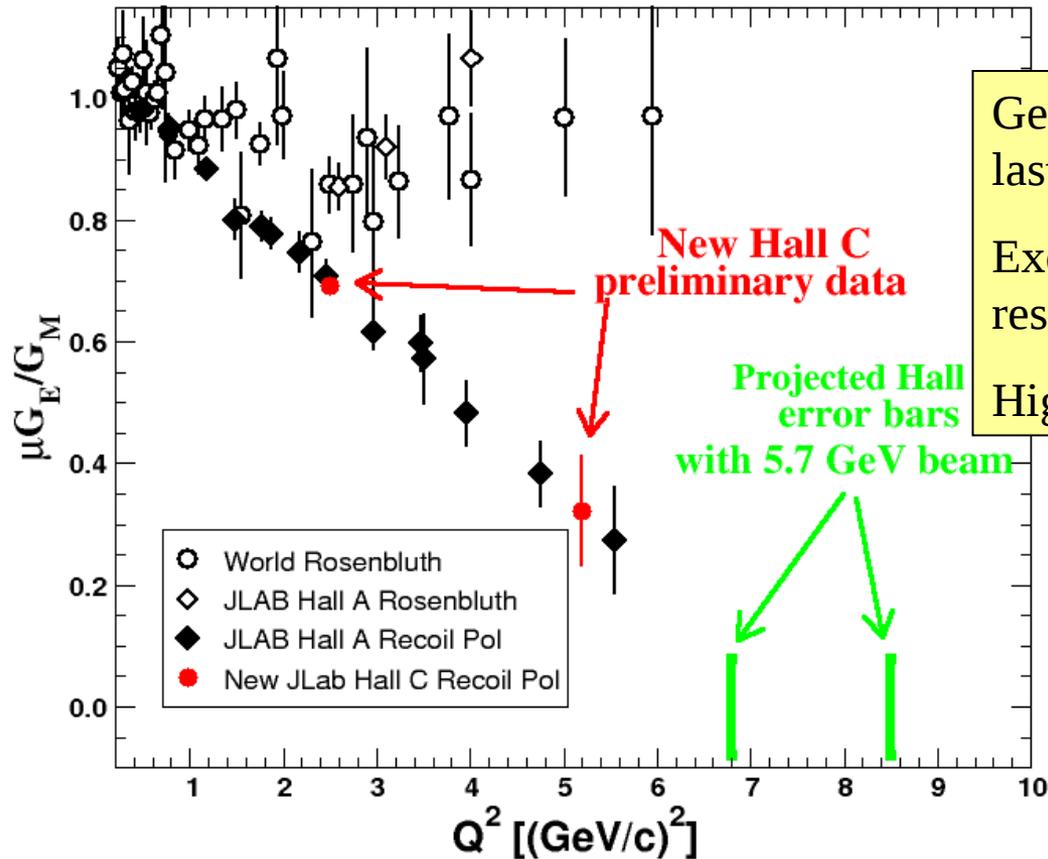
PRELIMINARY, not to be quoted



Some model calculations predict a greater sensitivity to 2γ for the polarization than for the cross section data

The preliminary data for $Q^2=2.5 \text{ GeV}^2$ show no ϵ -dependence of G_{Ep}/G_{Mp} at the 0.01 level

E04-108 (Gep3)

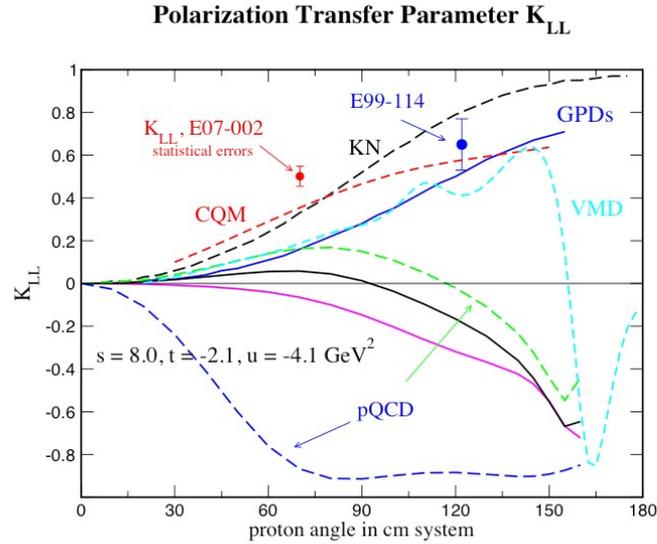
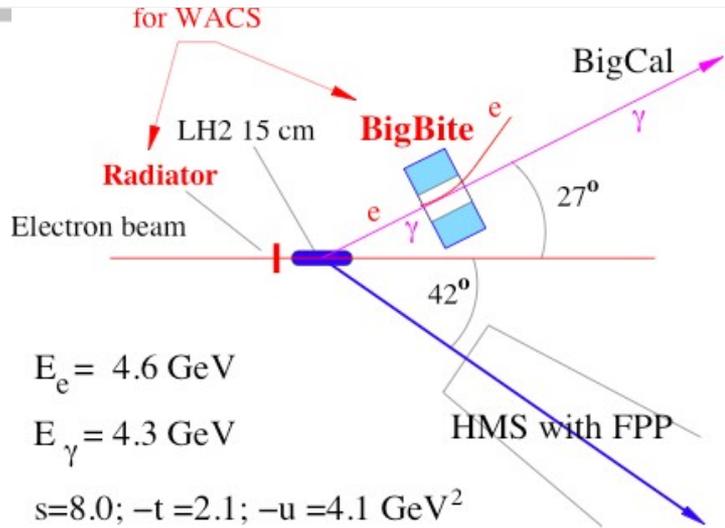


Gep3 took data at $Q^2 = 2.5$ and 5.2 GeV^2 last Fall.

Excellent agreement with past Hall A results.

High Q^2 points were completed in June 08

E07-002: Polarization transfer in Wide Angle Compton Scattering

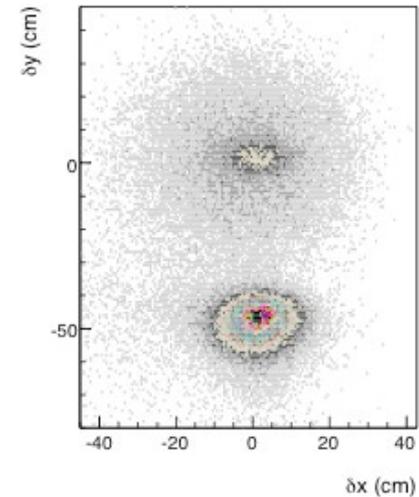
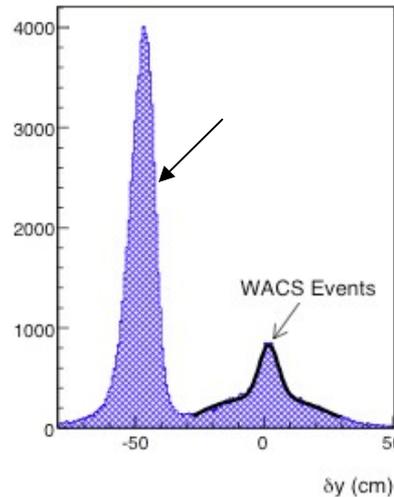


Very clean data

Calibration to elastic e-p polarization data taken parallel to WACS

Expected small systematic uncertainty

Result is favor to CQM



Publications in last year

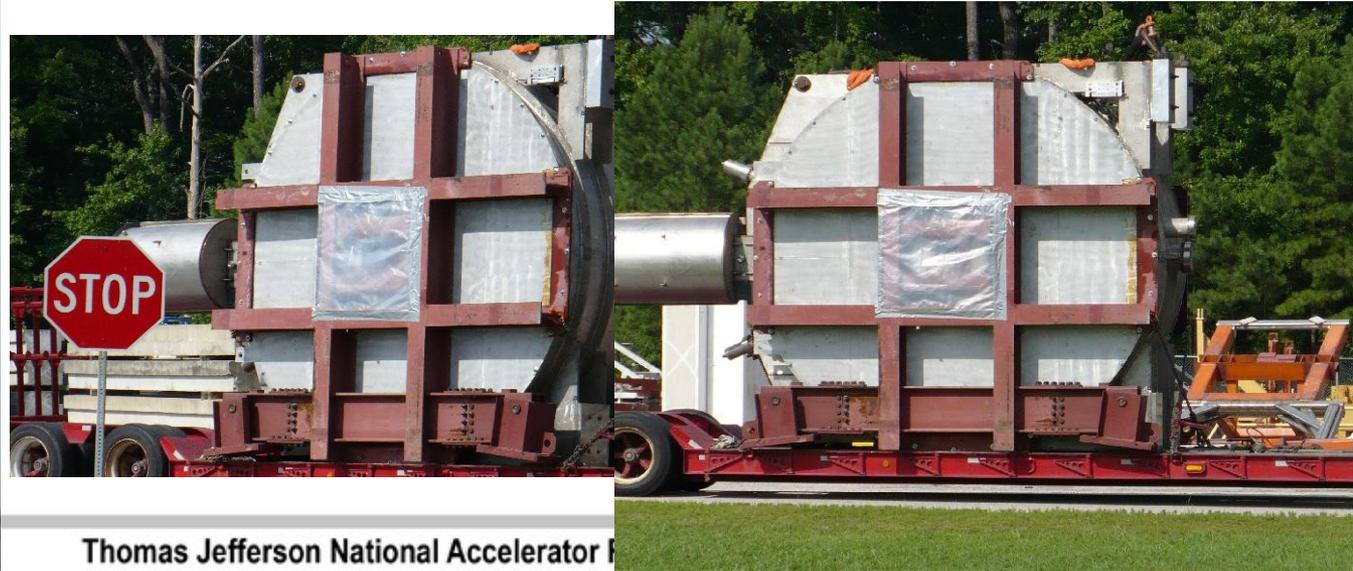
E00-006	Transverse Beam Spin Asymmetries in Forward-Angle Elastic Electron-Proton Scattering	PRL 99, 092301
E00-006	Testing the Standard Model by Precision Measurement of the Weak Charges of Quarks	PRL 99, 122003
E91-016	Quasifree Λ , Σ^0 , and Σ^- electroproduction from $^1,2\text{H}$, $^3,4\text{He}$, and C	PRC 76, 122003
E01-107	Measurement of Nuclear Transparency for $A(e, e'\pi^+)$	PRL 99, 242502
E00-006	G^0 Electronics and Data Acquisition (Forward-Angle)	NIM A586, 251
	Empirical Fit to Inelastic Electron-Deuteron and Electron-Neutron Resonance Region Transverse Cross Sections	PRC 77, 065206
E01-108	Transverse momentum dependence of semi-inclusive pion production	PLB 665, 20

Submitted: Scaling study, Inclusive ep fits, eta production-S11, 2 Pion form factor papers

2008 Shutdown Activities

- Accelerator off June 8 - Oct 10 (+2 weeks)
- Restore HMS Focal Plane (remove FPP)
- Remove cryotarget, install UVA polarized target
- Install polarized target exit helium bag
- Anneal BigCal lead glass
- Install detectors for SANE
- HKS/Qweak preparation
- Remove G0 magnet
- Remove G0 rails, disassemble Ferris Wheel
- Extend floor for HKS
- Assemble HES Spectrometer

G0 Magnet move



Thomas Jefferson National Accelerator



Hall C 6 GeV Approved Experiment Summary



Base Equipment Experiments (0 experiments, 0 days):

Large Installation Experiments (8 experiments, 274 days + 23 C3):

E07-003	Spin Asymmetries on the Nucleon Experiment	34 days	A
E05-101	Helicity Correlations in Wide-Angle Compton Scattering	14 days	A-
E07-011	A High Precision Measurement of g_{1d}/F_{1d}	8 days (20)	A
E05-008	The Qweak Experiment: A Search for Physics at the TeV Scale via a Meas. of the Proton's Weak Charge	198 days	A
E05-115	Spectroscopic Investigation of Hypernuclei in ... (II)	20 days	A-
E08-002	Additional beam request to E05-115	18 days	B+ (C3)
E08-012	Study of Light Hypernuclei by Pionic Decay at JLab	5 days	A- (C3)

Semi-SANE and GeN not renewed at last PAC. Semi-SANE deuteron can run parasitic to g_{1d}

Color coding indicates experiments using similar apparatus



Budget

- Increased electricity bill unexpected shock to this year's budget
- Planning for continuing resolution for entire FY09
- Continued hiring freeze
- Startup of fall running delayed 2 weeks to push electricity costs into FY09
- 6 month down in FY09 unless presidents budget passes for part or all of year. (Hall C down anyway)
- Strong effort to start HKS in late FY09



Now -> 12 GeV Shutdown

June-October 2008

Install Polarized Target/SANE, prep work for HKS/Qweak

October 25, 2008 – January 23, 2009

E07-003 - Spin Asymmetries on the Nucleon Experiment

February, 2009

E07-011 – A High Precision Measurement of g_{1d}/F_{1d} + Semi-SANE parasitic

March-August, 2009 (~6 month install)

HES/HKS Installation

Late August-October, 2009 (2 m beam time)

HES/HKS Run

Late October, 2009 – May 14, 2012 (2.5 year)

Qweak installation and run

Assumptions:

1. Run SANE, g_{1d} , HKS, Qweak
2. 2.5 years for Qweak, which includes 6 month install, and 6 month accelerator down



Hall C Challenges

- Many simultaneous design and engineering efforts going on
 - SANE – Loose ends (Hall C)
 - HKS – Beamline, HES+Splitter support, sieve slits, detector supports, shielding (Engineering, Hall C)
 - Qweak – Target, infrastructure, shielding (Hall C)
 - Compton/Beamline Upgrade (MIT, Engineering)
 - 12 GeV/SHMS: 5 SC magnets, Carriage/shield house (Hall C)
- 12 GeV Engineering work sometimes trumps 6 GeV work
- Staff attrition during hiring freeze – Hall C rasters
- No beam time for short extensions or clever ideas
- My learning curve

Summer Workshop

- Thanks to organizing committee:
 - A. Ahmidouch, H. Gao, H. Mkrtchyan, J. Roche, A. Bruell
- More formal Hall C “Collaboration”
 - “Hall C User Group”
 - “12 GeV (SHMS) Working Group”
- Gathering this evening at “Rolf's Place”, 6:30PM