

HALL-A STATUS REPORT

Hall A Collaboration Meeting June 12-14, 2008

KEES DE JAGER
JEFFERSON LABORATORY

Our wine-and cheese gathering is in A110 on Friday evening, starting at 6:00 pm.
Dennis has graciously agreed to chaperone us.
If you attend (most of you, I hope) please pay Stephanie the standard 9 \$ contribution



Achievements 2008-I

- Successfully ran
 - ▲ Dec/Jan E05-110 Coulomb Sum Rule Zein-Eddine Meziani
 - ▲ Jan E06-002 PREx tests Kent Paschke
 - ▲ Jan E06-007 $^{208}\text{Pb}(e,e'p)$ addition Arun Saha
 - ▲ Feb-Mar Installation of BigBite Ed Folts
 - ▲ Apr E04-007 Threshold π^0 Electroproduction Richard Lindgren
 - ▲ May Installation of electron package Guy Ron
 - ▲ June E08-007 G_E^p/G_M^p at Low Q^2 Doug Higinbotham
- 13(!) proposals submitted to PAC-33 for a total of 281 days with an allocation of 101 days
 - 4 proposals approved with A rating, 3 with B, 2 with C3 rating
 - Backlog to 5.1 years
- Essential whether new proposals can run in parallel with Qweak
 - G_E^p and $N \rightarrow \Delta$ definitely can
 - DVCS can if it accepts a hit in beam energy (polarization?)
 - $x > 2$, deuteron threshold probably can for most of their time
 - $^4\text{He}(e,e'p)$ definitely can not



Hall A Approved Proposals PAC 4-33

	Number Approved	Days Approved	Polarized beam	A status	Number Completed	Days run	Number Jeopardized	Days to be run
Nucleon and Meson Form Factors/Sum Rules	14	277	12	10	13	226	2	51
Few Body Nuclear Properties	19	299	9	4	16	246	6	53
Properties of Nuclei	12	212	2	6	8	135	7	77
N* and Meson Properties	12	185	11	4	4	107	2	78
Strange Quarks and Parity Violation	7	192	5	6	5	130	1	62
Total	64	1165	39	30	46	844	18	321
Conditionally Approved	3	49	0	1				49

- 46 Experiments completed
- 165/115(!) days scheduled for the next 12 months
- Backlog ~5.3 years (annual average for Hall A is ~60 days at 80% funding)



Publications (incl. submissions) in 2008-I

- M. Iodice et al., High Resolution Spectroscopy $^{12}\text{B}_\lambda$ by Electroproduction, PRL 99, 052501 (2007), nucl-ex/0705.3332
- R. Shneur et al., Investigation of proton-proton short-range correlations via the $^{12}\text{C}(e,e'pp)$ reaction, PRL 99, 072501 (2007), nucl-ex/0703023
- G. Ron et al., The Proton Elastic Form Factor Ratio $\mu_p G_E^p/G_M^p$ at Low Momentum Transfer, PRL 99, 202002 (2007), nucl-ex/0706.0128
- M. Mazouz et al., Deeply Virtual Compton Scattering off the Neutron, PRL 99 2420501 (2007), nucl-ex/0709.04501
- K. Slifer et al., He-3 Spin-Dependent Cross Sections and Sum Rules, submitted to PRL, 0803.2267 [nucl-ex]
- P. Solvignon et al., Quark-Hadron Duality in Neutron (^3He) Spin Structure, submitted to PRL, 0803.3845 [nucl-ex]
- R. Subedi et al., Probing Cold Dense Nuclear Matter, Science 320, 12XX (2008)
- A. Shahinyan et al., The Electromagnetic calorimeter in JLab Real Compton Scattering Experiment, arXiv:0704.1830
- Total number of Hall A publications: Science 1, PRL+PLB 35(+2), PRC 17, NIM 14(+1).
- Average time from completion of experiment to submission 20 months with 75% within 3 years.
- At present 5 experiments that have not submitted a manuscript more than 3 years after completion
- Hall A has been running now for 11 years, with an average publication output of 4+. Essential that more effort goes into publications, especially archival pubs
- Top cited Hall A publications: 2 250+, 2 100+, 11 50+
- Please enter all publications into the JLab publication data base on submission



PUBLICATIONS-II

- Archival papers promised to be completed **LAST** year:
 - E89-044 $^3\text{He}(e,e'p)$ complete L/T separation
 - E91-026 deuteron A and B next spring
 - E93-050 VCS
 - E94-010 GDH only introduction needed
 - E99-007 $G_E^p\text{-II}$
 - E99-114 WACS
- Achievements to date:
 - ✓ E89-003 $^{16}\text{O}(e,e'p)$ published
 - ✓ E91-010 HAPPEX-I published
 - ✓ E91-011 $N \rightarrow \otimes$ published
 - ✓ E93-027 $G_E^p\text{-I}$ published
 - ✓ E94-012 $H(\odot, p)\pi^0$ published
 - ✓ E94-104 $\odot n \rightarrow \pi^- p$ published
 - ✓ E95-001 G_M^n published
 - ✓ E99-117 A_1^n published
- Standard publications in draft form for too long:
 - Kaon electroproduction
 - Transverse SSA
 - ^{16}N hypernuclear spectroscopy



Scheduled Experiments in Hall A

<u>Exp</u>	<u>Title</u>	<u>Contact persons</u>
Jun-Oct	Installation of Polarized ^3He target	
Oct-Feb/May	run BigBite plus polarized ^3He experiments	
	E06-010 transversity	Xiaodong Jiang
	E07-013 normal SSA	Tim Holmstrom
	E06-014 d_2^n	Brad Sawatsky
	E05-015 ^3He SSA	Todd Averett
	E08-005 Target SSA	Vince Sulkosky
	E05-102 Quasi-elastic ^3He	Doug Higinbotham
2009	HAPPEX-III, DIS-Parity	
2010	Lead Parity	

- ▲ Schedule through summer 2009 will be posted soon. However, there are significant uncertainties about the budget (continuing resolution expected until April 2009, we might not get the President's budget,...). Even if we do get the PBO8 after the end of the CR, the present budget allocation to Physics is dollar flat for Hall A, where the FY08 budget was already so bad that it had significant impact on user support. Under that scenario, JLab management has decided to terminate running after Feb 22 (the completion of d_2^n) until mid August, the start of HAPPEX-III. This has the consequence that the three last polarized ^3He experiments will not run in the foreseeable future.

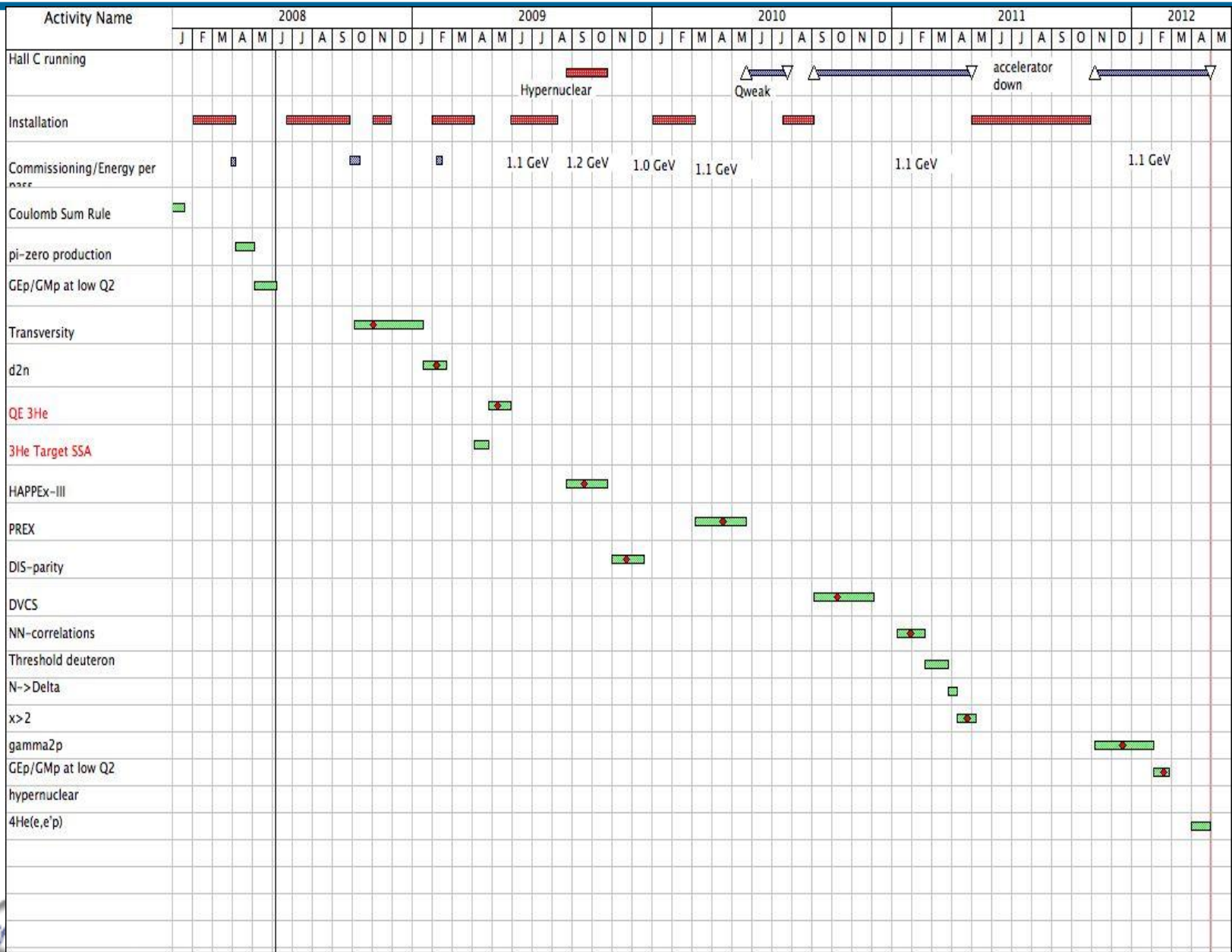


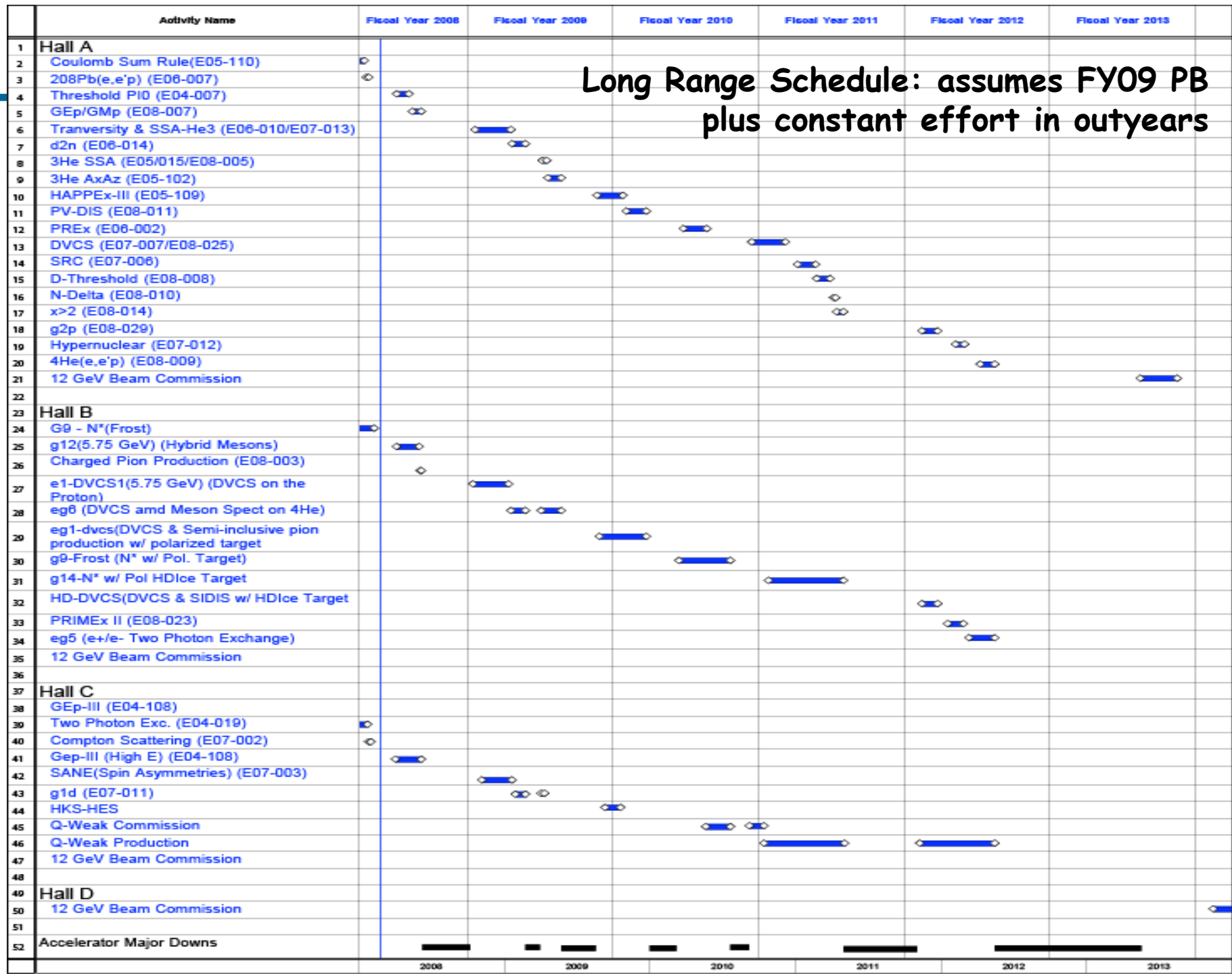
Long-Term Schedule

- CEBAF will be limited to ~33 weeks of beam on target in FY10 and following FYs as long as the budget continues as expected. This corresponds to a total of 4 months accelerator down per year, with as much as possible during the summer.
- Accelerator needs 6 month down prior to the 12 GeV installation
- ▲ The long-term schedule is locked by the start of Qweak, scheduled for May 21, 2010. Qweak will run at a fixed energy/pass of 1.165 (possibly 1.185) GeV and maximum polarization, severely restricting the available energy selection, current and polarization.
- ▲ Also, resources, both capital and designers, will become scarcer as the 12 GeV activities increase.
- ▲ The three Hall A parity experiments can not run in parallel with Qweak, thus have to be scheduled starting mid August 2009, in the order HAPPEX-III, PVDIS and PREx.
- ▲ The g_2^p experiment requires a very large installation effort, optimally in parallel with the 6 month accelerator down in 2012.
- ▲ Tony Thomas will present the long term schedule at the User Group meeting, next week.



Hall A Schedule (Very Tentative!)





Year	Experiment	Major Installation Tasks	Special Accel. Requirements	Scientific Rating	PAC Days
2008					
E05-110	Done Coulomb Sum Rule	Calorimeter in HRS FP	$E_0 < 800$ MeV	A-	26
E06-007	$^{208}\text{Pb}(e, e^3 p)$ Done	Standard		A-	makeup a few days missing from 2007 run
E04-007	Running Threshold π^0 electro-production – Chiral dynamics	BigBite Done		B+	16
E08-007	Low Q^2 G_E^p/G_M^p	BigBite Done	Standard	A-	14
2009					
E06-010	Transversity	Polarized ^3He , BigBite	Standard	A	29
E07-013	Normal SSA in DIS on pol. ^3He	Polarized ^3He , BigBite	Standard	B	0 (parasitic on E06-010)
E06-014	d_2^n	Polarized ^3He , BigBite		A	13
E05-015 E08-005	3 Experiments Dropped if FY09@26 weeks Pol. ^3He target SSA	Polarized ^3He , BigBite 3 Experiments Dropped if FY09@26 weeks		B+	8
E05-102	QE ^3He	Polarized ^3He , BigBite		A-	15
E05-109	HAPPEX-III	Møller and Compton upgrade	Small helicity correlations (~ 1/20*HAPPEX I)	A-	30 (start)



Year	Experiment	Major Installation Tasks	Special Accel. Requirements	Scientific Rating	PAC Days
2010					
E05-109	HAPPEX-III	Completion	Small helicity correlations (~ 1/20*HAPPEX I)	A-	Complete
E08-011	DIS-parity	High-speed DAQ		A-	32
E06-002	PREx: Lead Parity	<u>Room-temperature septa</u> <u>Møller and Compton upgrade</u>	Small helicity correlations (~ 1/20*HAPPEX I)	A	30
E07-007	DVCS on the proton	PbF ₂ calorimeter		A	23
E08-025	DVCS on the neutron	PbF ₂ calorimeter		B+	17
2011					
E07-007 E08-025	DVCS on the proton and neutron	Completion		A, B+	40
E07-006	Short Range Correlations via (e,e'pN)	BigBite		A-	23
E08-008	Deuteron electrodisintegration near threshold	BigBite		B+ (C3)	18
E08-010	N-Δ Coulomb quadrupole amplitude at low Q ²			B+	3
E08-014	Three-nucleon correlations			A-	12

Requires equipment \$\$ early in FY09 to meet schedule



Year	Experiment	Major Installation Tasks	Special Accel. Requirements	Scientific Rating	PAC Days
2012					
E08-027	g_2^p and the LT Spin polarizability?	Septa + beamline chicane Polarized target		A-	24
E07-012	Hypernuclear ^{16}O and production	Septa		B+	12
E08-009	$^4\text{He}(e,e'p)$			B+ (C3)	20.5



6 GeV Experimental Equipment: Hall A

HALL A

	FY08 PLAN	FY09 PLAN	FY10 PLAN	FY11 PLAN	FY12 PLAN	FY13 PLAN	FY14 PLAN
ITEM							
Polarized 3He Target	\$135						
Parity Instrumentation	\$117	\$170					
BigBite	\$100						
High-Speed Data Acq. System (On-going)					\$100	\$100	\$100
Compton Polarimeter	\$155	\$50					
Transversity							
Coulomb Sum Rule	\$18						
DVCS	\$30	\$80	\$300				
Moller Polarimeter	\$30	\$150					
DIS Parity		\$100					
deltaLT		\$50	\$630	\$300			
General Capital (Long-Term Maintenance)	-\$31			\$200	\$200	\$200	\$200
Totals - Hall A	\$554	\$600	\$930	\$500	\$300	\$300	\$300



12 GeV Schedule

- On track for CD-3 review this summer
- Hall A scheduled to start commissioning in Fall 2013
- Plans for large instrumentation developments starting:
 - PV-DIS at 12 GeV
 - Møller at 12 GeV
 - Super BigBite
 - HES/HKS in Hall A



Summary

- Hall A continues to have a very active and successful research program, but running the 6 GeV program will continue under serious pressure.
- A first draft of a long-term schedule for the 6 GeV program will be presented at the User Group meeting next week. Vocalize your concerns when you feel the need.
- Also, make our achievements known to the scientific community through timely publications.

