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

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Achievements 2008-I

Successfully ran

\mathbf{A}	Dec/Jan	E05-110	Coulomb Sum Rule	Zein-Eddine Meziani
\mathbf{A}	Jan	E06-002	PREx tests	Kent Paschke
\mathbf{A}	Jan	E06-007	²⁰⁸ Pb(e,e'p) addition	Arun Saha
\mathbf{A}	Feb-Mar		Installation of BigBite	Ed Folts
\mathbf{A}	Apr	E04-007	Threshold π° Electroproduction	Richard Lindgren
\mathbf{A}	May		Installation of electron package	Guy Ron
\land	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-> Δ definitely can
 - DVCS can if it accepts a hit in beam energy (polarization?)
 - x > 2, deuteron threshold probably can for most of their time
 - ⁴He(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	14	277	12	10	13	226	2	51
Form Factors/Sum Rules								
Few Body Nuclear	19	299	9	4	16	246	6	53
Properties								
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 ¹²B_λ by Electroproduction, PRL 99, 052501 (2007), nucl-ex/0705.3332
- R. Shneor et al., Investigation of proton-proton short-range correlations via the ¹²C(e,e'pp) reaction, PRL 99, 072501 (2007), nucl-ex/0703023
- G. Ron et al., The Proton Elastic Form Factor Ratio μ_pG_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

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PUBLICATIONS-II

complete L/T separation

only introduction needed

next spring

- Archival papers promised to be completed LAST year:
 - E89-044 ³He(e,e'p)
 - E91-026 deuteron A and B
 - E93-050 VCS
 - E94-010 GDH
 - E99-007 G_F^p-II
 - E99-114 WACS
- Achievements to date:

✓E89-003	¹⁶ O(e,e'p)	published
✓E91-010	HAPPEX-I	, published
✓E91-011	N->⊗	published
✓E93-027	G _E P-I	published
✓E94-012	H(ᢆ©,p)π⁰	published
✓E94-104	© n -> π⁻p	published
✓E95-001	<i>G</i> _M ⁿ	published
✓E99-117	A_1^n	published
	_	

- Standard publications in draft form for too long:
 - Kaon electroproduction
 - Transverse SSA

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¹⁶N hypernuclear spectroscopy

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Scheduled Experiments in Hall A

<u>E×p</u>	<u>Title</u>	<u>Contact persons</u>
<mark>Jun-Oct</mark> Oct-Feb/May	Installation of Polarized ³ He targetrun BigBite plus polarized ³ He experimentsE06-010transversityE07-013normal SSAE06-014 d_2^n E05-015 ³ He SSAE08-005Target SSAE05-102Quasi-elastic ³ He	Xiaodong Jiang Tim Holmstrom Brad Sawatsky Todd Averett Vince Sulkosky Doug Higinbotham
2009 2010	HAPPEx-III, DIS-Parity 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 PB08 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 d₂ⁿ) 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
- A 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.
- A 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.
- A The g_2^p experiment requires a very large installation effort, optimally in parallel with the 6 month accelerator down in 2012.
- A Tony Thomas will present the long term schedule at the User Group meeting, next week.

Hall A Schedule (Very Tentative!)

Activity Name	2008					12				2009			- 23	2010				2011			- 3	2012									
	1	FM	AM	1 1	A	5 0	N D	1	F M	AI	MJ	J	AS	0	ND	JF	М	A	MJ	JA	S (N	DJ	FM	A M	11	AS	O N	D	FN	A
Hall C running											Ну	ypern	uclear						∆ Qweak	₹.	<u>/</u>				-	accele down	rator	۵			-7
Installation			1								8		1		8	_					8										
Commissioning/Energy per		E									1.1 0	GeV	1.2 (GeV	1.0	GeV	1.1	GeV					1.1	GeV					1.1	l GeV	
Coulomb Sum Rule																						_		_						_	
pi-zero production		1																													
GEp/GMp at low Q2																															
Transversity																															
d2n									•																						
QE 3He																														11 0	
3He Target SSA																															
HAPPEx-III				o																											
PREX																		•													
DIS-parity																															
DVCS																					-										
NN-correlations																															
Threshold deuteron										1																					
N->Delta					11	1				T	T.				1		1	1				11			3				1-1-	1 L	
x>2											-							-											-		
gamma2p		- 0-0											1		1 1		1		T I	1			1				<u> </u>				
GEp/GMp at low Q2											-							-													
hypernuclear					1-1	- P	i-i-	1			1	ð-ði	-	ti di	1.1		10-0			-1-1		10-10		-1-0						1	
4He(e,e'p)																															
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	Activity Name	Fk	coal Year 2008	Fiscal Year 2009	Fiscal Year 2010	Fiscal Year 2011	Fiscal Year 2012	Fiscal Year 2013	
1	Hall A								
2	Coulomb Sum Rule(E05-110)	0			•			-	
з	208Pb(e,e'p) (E06-007)	0			nna Ranae	Schedule	: assume	s FV09 Pl	R
4	Threshold PI0 (E04-007)				ng nange				
5	GEp/GMp (E08-007)				blue	constant	offont i	a autuaan	
6	Tranversity & SSA-He3 (E06-010/E07-013)			° – • •	pius	constant	e110111	louryeur	2
7	d2n (E06-014)			~					
8	3He SSA (E05/015/E08-005)			Ø					
9	3He AxAz (E05-102)								
10	HAPPEx-III (E05-109)			· · · · · · · · · · · · · · · · · · ·	•				
11	PV-DIS (E08-011)				<u>∽</u>				
12	PREx (E06-002)				○ →				
13	DVCS (E07-007/E08-025)				a	•			
14	SRC (E07-006)					<u> </u>			
15	D-Threshold (E08-008)					~			
16	N-Delta (E08-010)					•			
17	x>2 (E08-014)					8			
18	g2p (E08-029)								
19	Hypernuclear (E07-012)						~		
20	4He(e,e'p) (E08-009)						<u> </u>		
21	12 GeV Beam Commission							<u> </u>	
22									
23	Hall B								
24	G9 - N*(Frost)	– °							
25	g12(5.75 GeV) (Hybrid Mesons)		<u> </u>						
26	Charged Pion Production (E08-003)		0						I
27	e1-DVCS1(5.75 GeV) (DVCS on the			• •• •					
_	Proton) er8 (DVCS amd Meson Spect on 4He)	-							
28	and deer/DVCC & Camilinghative size								
29	production w/ polarized target			•	<u>ہ</u>				I
30	g9-Frost (N* w/ Pol. Target)	-			° °				
21	g14-N* w/ Pol HDIce Target	-				<u> </u>			
21	HD-DVCS/DVCS & SIDIS w/ HDIce Tarnet	-							
32	no orocioreo a cibio in noise raiger						<u> </u>		
33	PRIMEX II (E08-023)	-					<u> </u>		
34	eg5 (e+/e- Two Photon Exchange)						<u> </u>		
35	12 GeV Beam Commission								
36									
37	Hall C								
38	GEp-III (E04-108)	-							
39	Two Photon Exc. (E04-019)	•							
40	Compton Scattering (E07-002)	0							
41	CANE(Spin Asymptotics) (E07.000)	-	• • •						
42	SAME(Spin Asymmetries) (EU7-003)	-		○					
43	g1d (E07-011)	-		©	L				
44	HK3-HE3	-		0					
45	Q-weak Commission	-			Q	~ ~ ~			
46	42 GoV Roam Commission	-				•	· · · ·		
47	12 Gev beam Commission	-							
48		-							
40	12 GeV Beam Commission	-							
50	TE GEV Dean Commission	-							- ⁻
31	Accelerator Major Downs	-							
52									
1		1	2008	2009	2010	2011	2042	2013	

Draft Schedule - Hall A 1 of 3

Year	Experiment	Major Installation Tasks	Special Accel. Requirements	Scientific Rating	PAC Days	
2008						
E05-110	Done Coulomb Sum Rule	Calorimeter in HRS FP	$E_0 < 800 \text{ MeV}$	A-	26	
E06-007	²⁰⁸ Pb(e,e'p) Done	Standard		A-	makeup a few days missing from 2007 run	
E04-007	Running Threshold π0 electro- production – Chiral dynamics	BigBite		B+	16	
E08-007	Low $Q^2 G_E^p / G_M^p$	BigBite Done	Standard	A-	14	
2000						
E06-010	Transversity	Polarized 3He BigBite	Standard	Α	29	
E07-013	Normal SSA in DIS on pol. ³ He	Polarized 3He, BigBite	Standard	B	0 (parasitic on E06-010)	
E06-014	d_2^n	Polarized 3He, BigBite		А	13	
E05-015	3 Experiments Dropped if	Polarized 3He, BigBite		В+	8	
E08-005	FY09@26 weeks Pol. ³ He target SSA	3 Experiments Dropped in				
E05-102	QE ³ He	Polarized 3He, BigBite		A	15	
E05-109	HAPPEx-III	Møller and Compton upgrade	Small helicity correlations (~ 1/20*HAPPEX I)	A-	30 (start)	

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Quality

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Year	Experiment	Major Installation Tas	ks	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	Room-temperature septa Møller and Compton up	a grade	Small helicity correlations (~ 1/20*HAPPEX I)	А	30
E07-007	DVCS on the proton	PbF ₂ calorimeter			А	23
E08-025	DVCS on the neutron	PbF ₂ calorimeter			B+	17
2011			Real	lires equipment \$\$		
E07-007 E08-025	DVCS on the proton and neutron	Completion	early	y in FY09 to meet	A, B+	40
E07-006	Short Range Correlations via (e,e'pN)	BigBite	sche	dule	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

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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 He(e,e'p)			B+ (C3)	20.5

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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

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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

12 GeV UPGRADE SCHEDULE



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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.