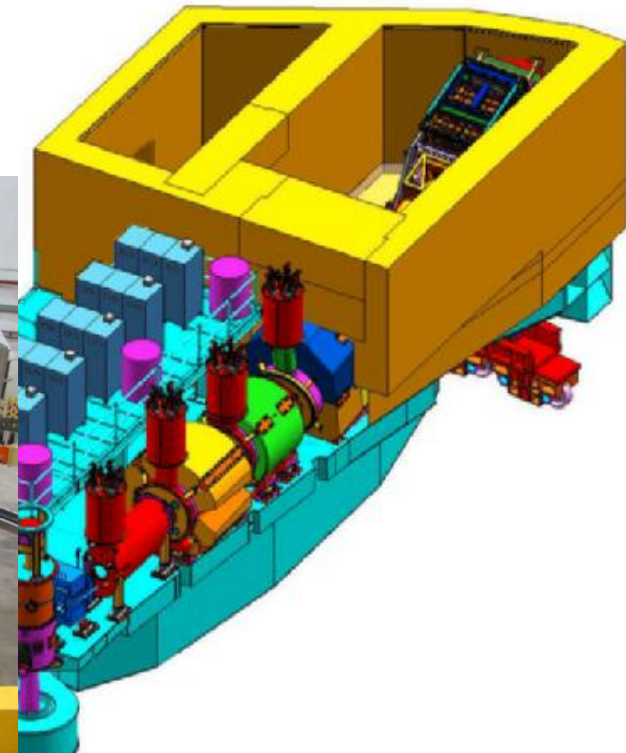
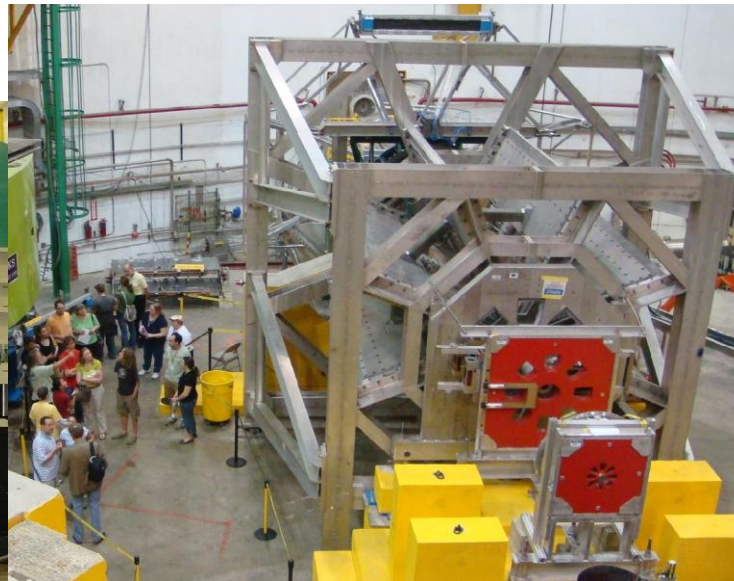
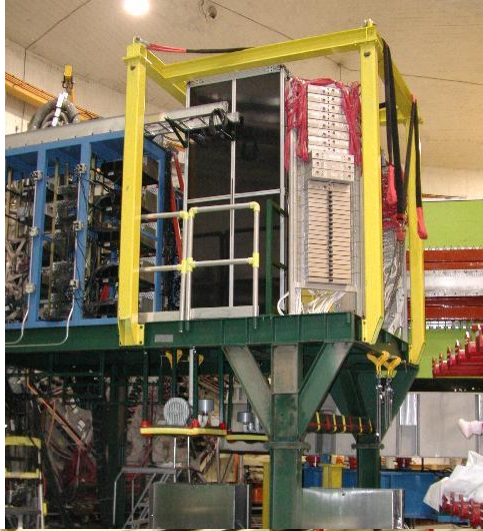


Hall C Summer Workshop

August 19-20, 2011



Publications in last year

G0	The G0 Experiment: Apparatus for Parity-Violating...	NIIM A646, 59
E01-107	Nuclear transparency and effective kaon -nucleon cross section from the $A(e, e'K^+)$ reaction	PRC 84, 015210
G0	Transverse Beam Spin Asymmetries at Backward Angles in Elastic Electron-Proton and Quasi-elastic Electron-Deuteron Scattering	PRL 107, 022501
E04-019	Search for effects beyond the Born approximation in polarization transfer observables in $e\uparrow p$ elastic scattering	PRL 106, 132501
E02-019	Scaling of the F2 structure function in nuclei and quark distributions at $x>1$	PRL 105, 212502
E02-017	Kaon, Pion and Proton Associated Photofission of Bi Nuclei	Phys.Atom.Nucl. 73, 1707
E01-006	Probing Quark-Gluon Interactions with Transverse Polarized Scattering	PRL 105, 101601
E02-019	New measurements of high-momentum nucleons and short-range structures in nuclei	Arxiv:1107.3583
E04-019	Semi-Inclusive Charged-Pion Electroproduction off Protons and Deuterons: Cross Sections, Ratios and Access to the Quark-Parton Model at Low Energies	Arxiv: 1103.1649

Total Publications: 92 PRL: 36 NIM: 11
81 "Hall C" PhDs to date, 4 in last year



Schedule Overview

Present – November 18, 2011

6 month down
SOS decommissioning
HKS Removal
Moller Quad Repair

November 19, 2011 – May 13, 2012

Qweak running

May 14, 2012 – September, 2012

Qweak and SOS removal

September 2012

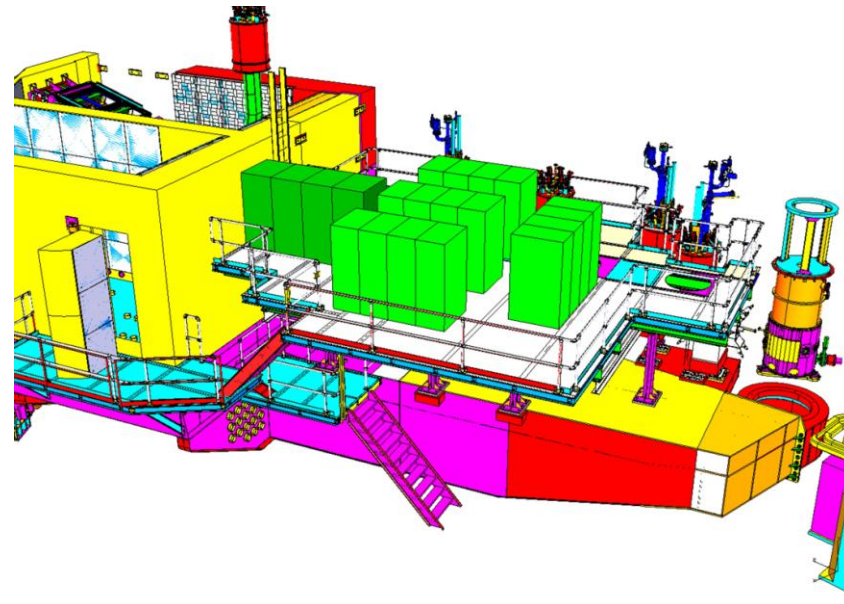
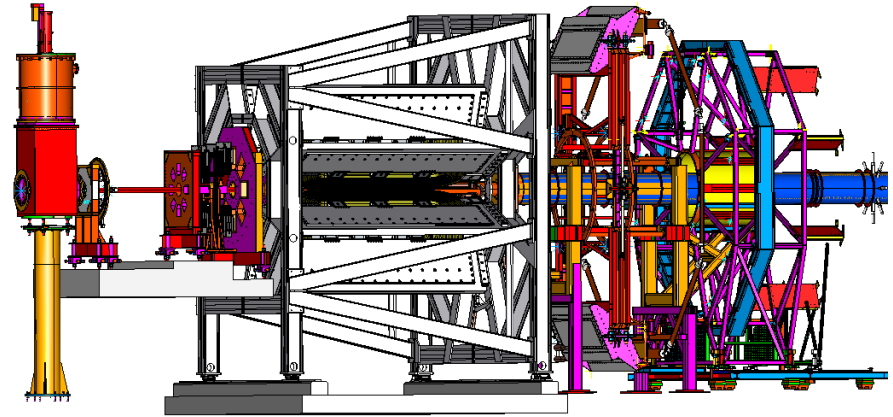
Start of SHMS construction

September 2014

SHMS/Detector checkout

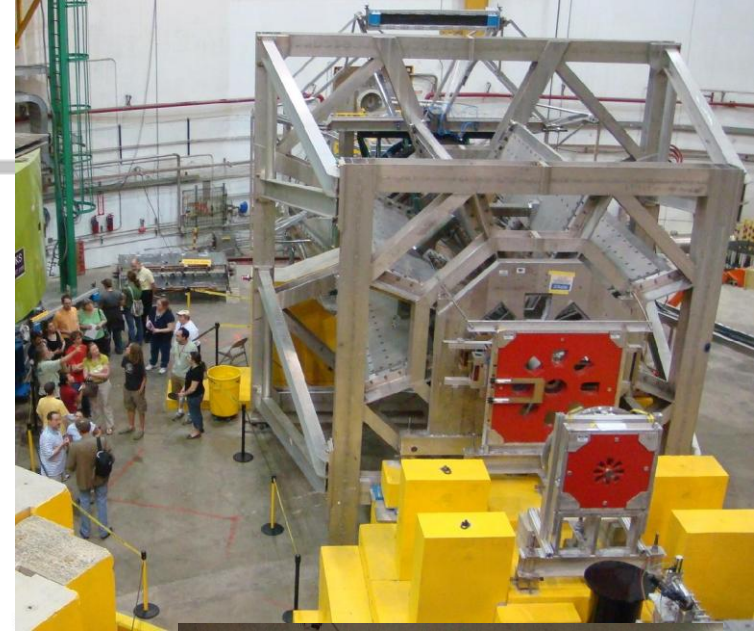
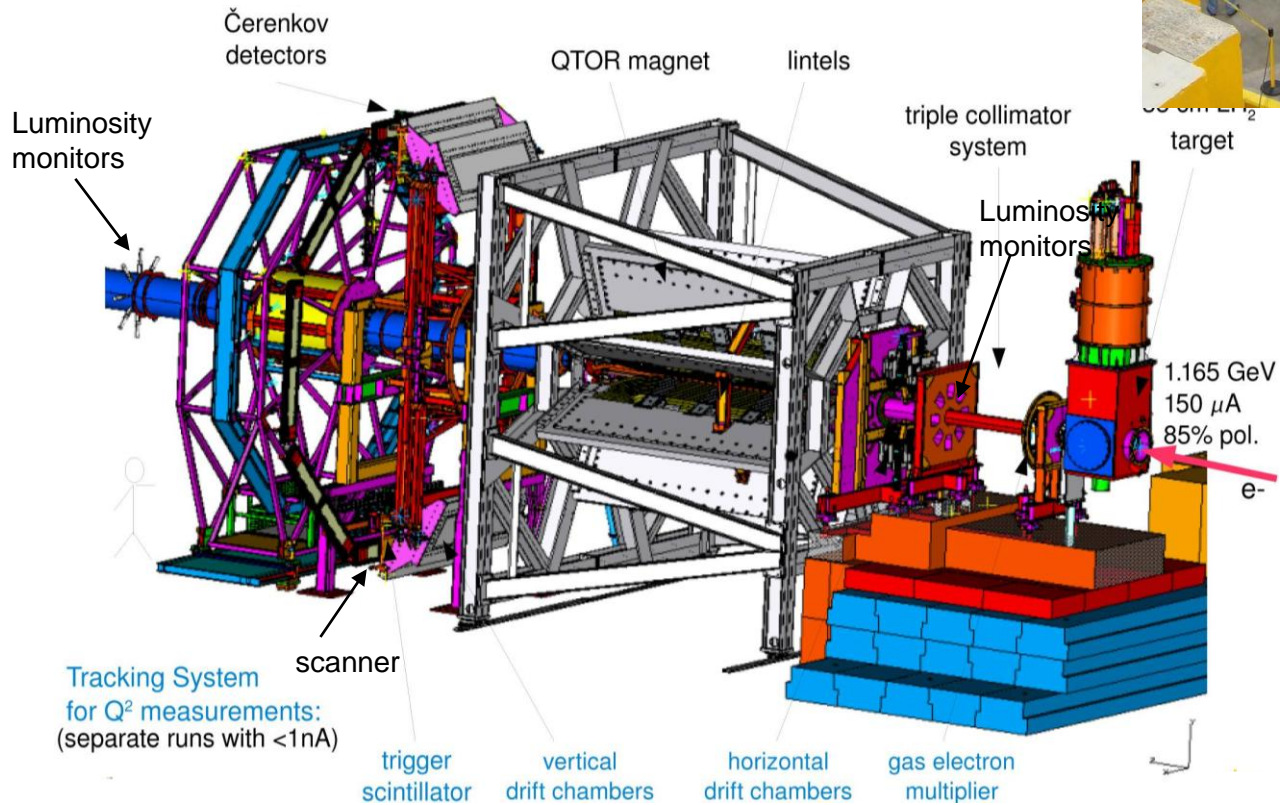
2015

Engineering Runs
Commissioning Experiments



Qweak

Qweak – measurement of proton weak charge through parity violating electron scattering ongoing in Hall C



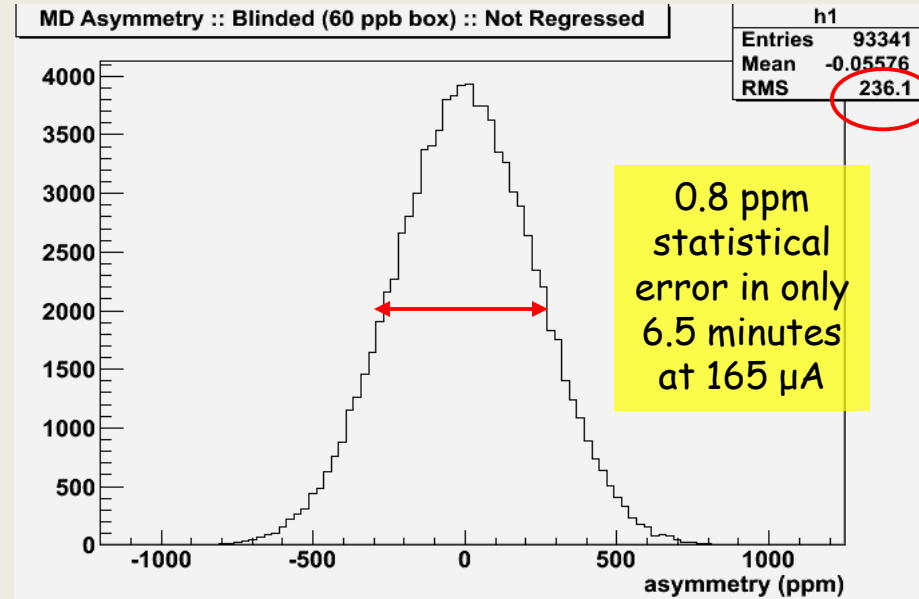
LH₂ Data Quality

Convergence to mean $\sim \text{rms}/\sqrt{N}$.
Width is a very important FOM!

At 165 μA , total detected rate is 5.83 GHz.

→ Pure counting statistics: 215 ppm
+ detector shower fluctuations 232 ppm
+ current normalization and target 235 ppm

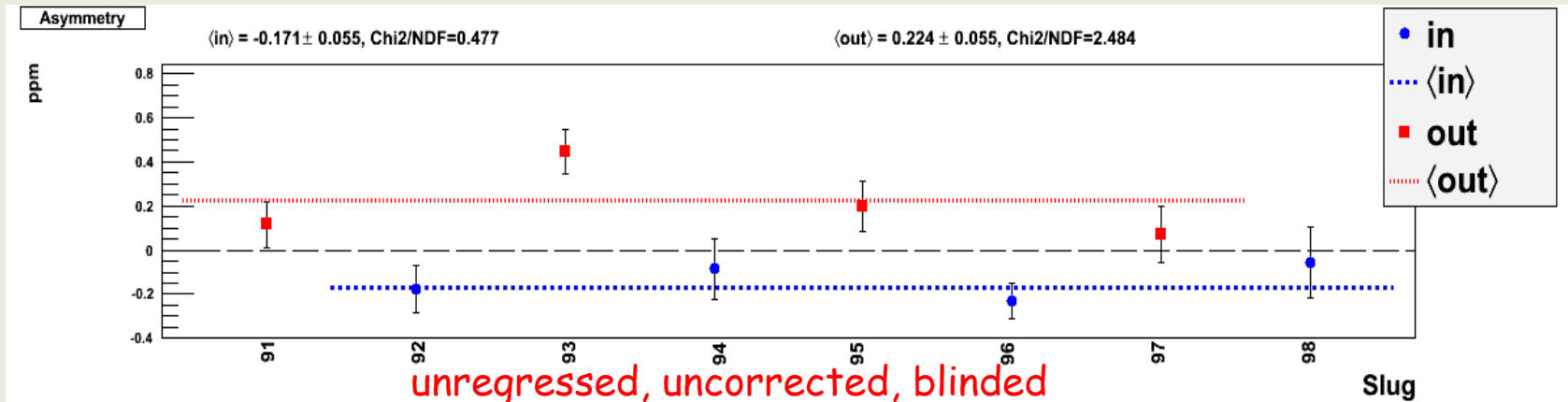
Width is understood and about 10% above c.s.



The electron polarity may be reversed every 1 msec by *electronic* means.

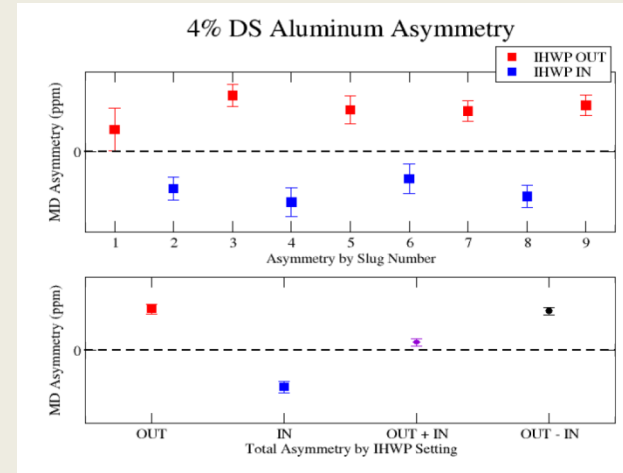
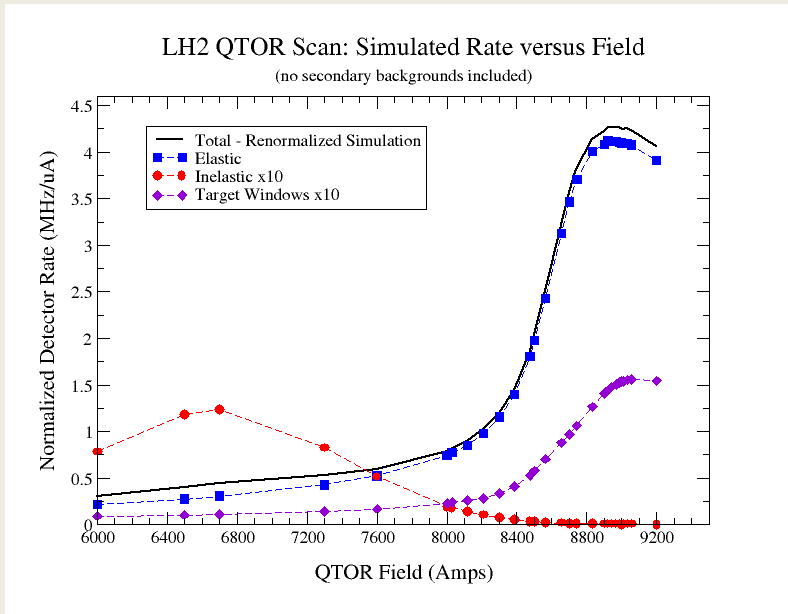
An Insertable Half Wave Plate (IHWP) *optically* flips the polarity before every 8 hour "slug".

The signal must reverse sign.



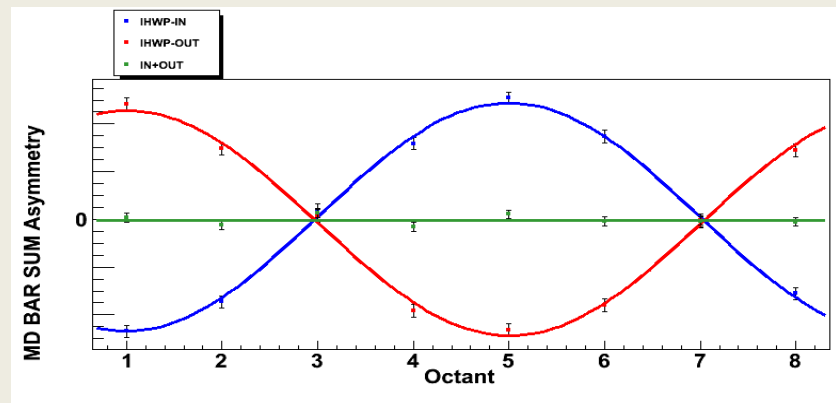
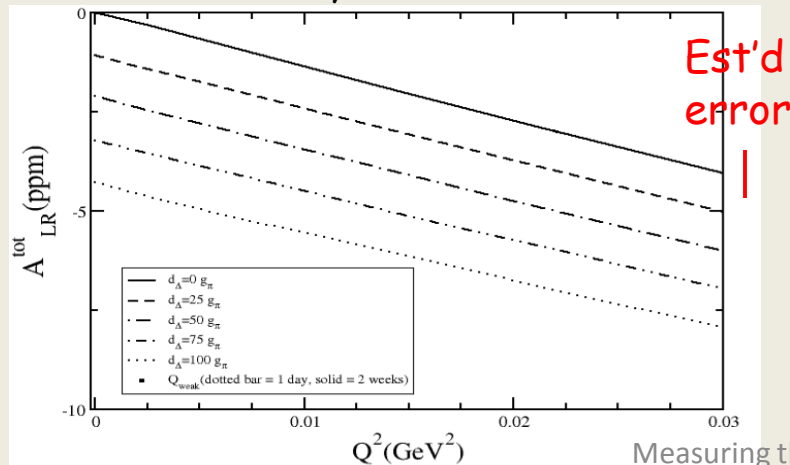
Ancillary Physics Bkg Measurements

Aluminum target windows - elastic +QE
 ~3% dilution of signal, ~20% correction



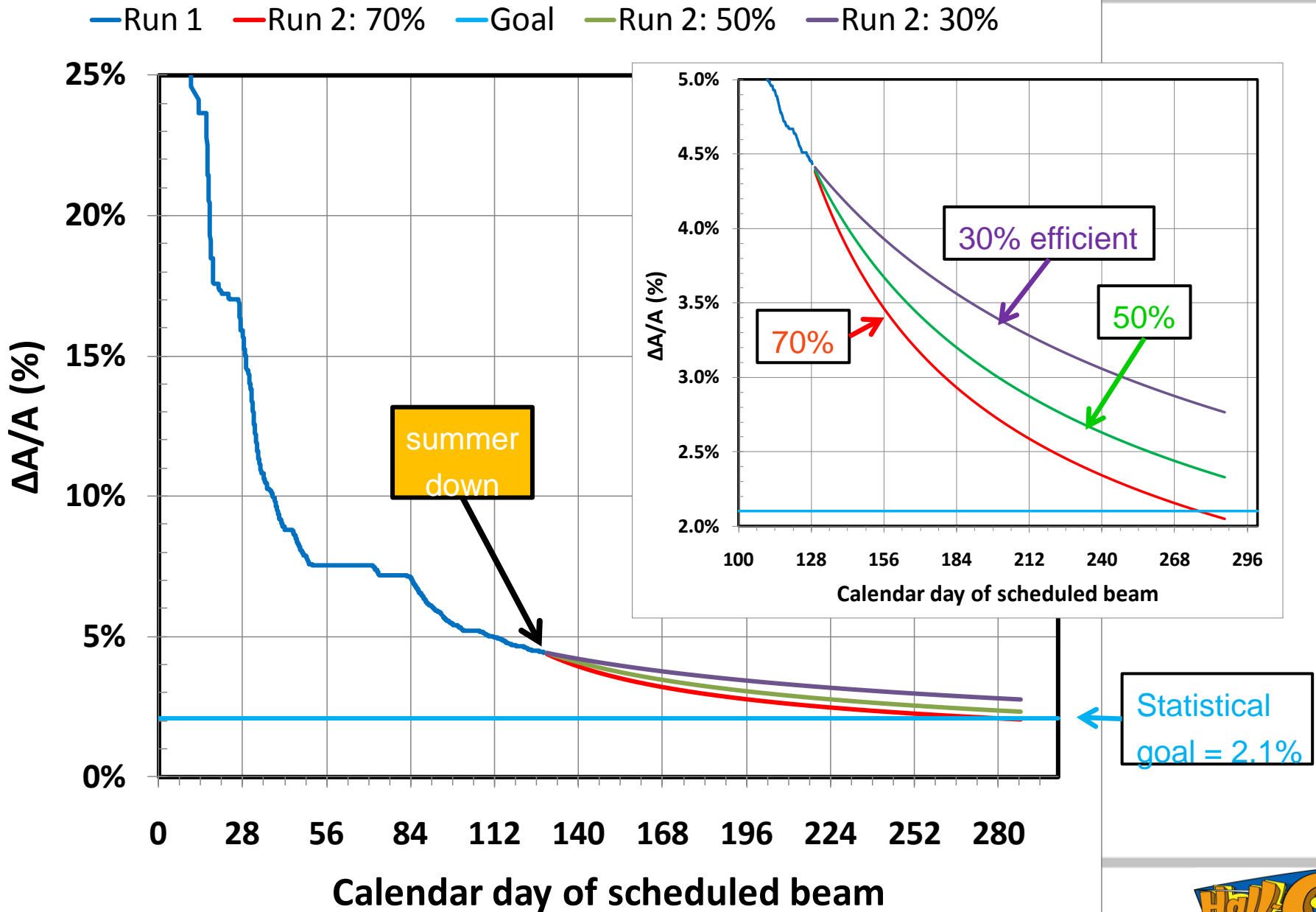
$N \rightarrow \Delta$ asymmetry
 ~0.1% dilution, ~1% correction

Parity conserving, transverse asymmetry on LH2.
 A very small correction.

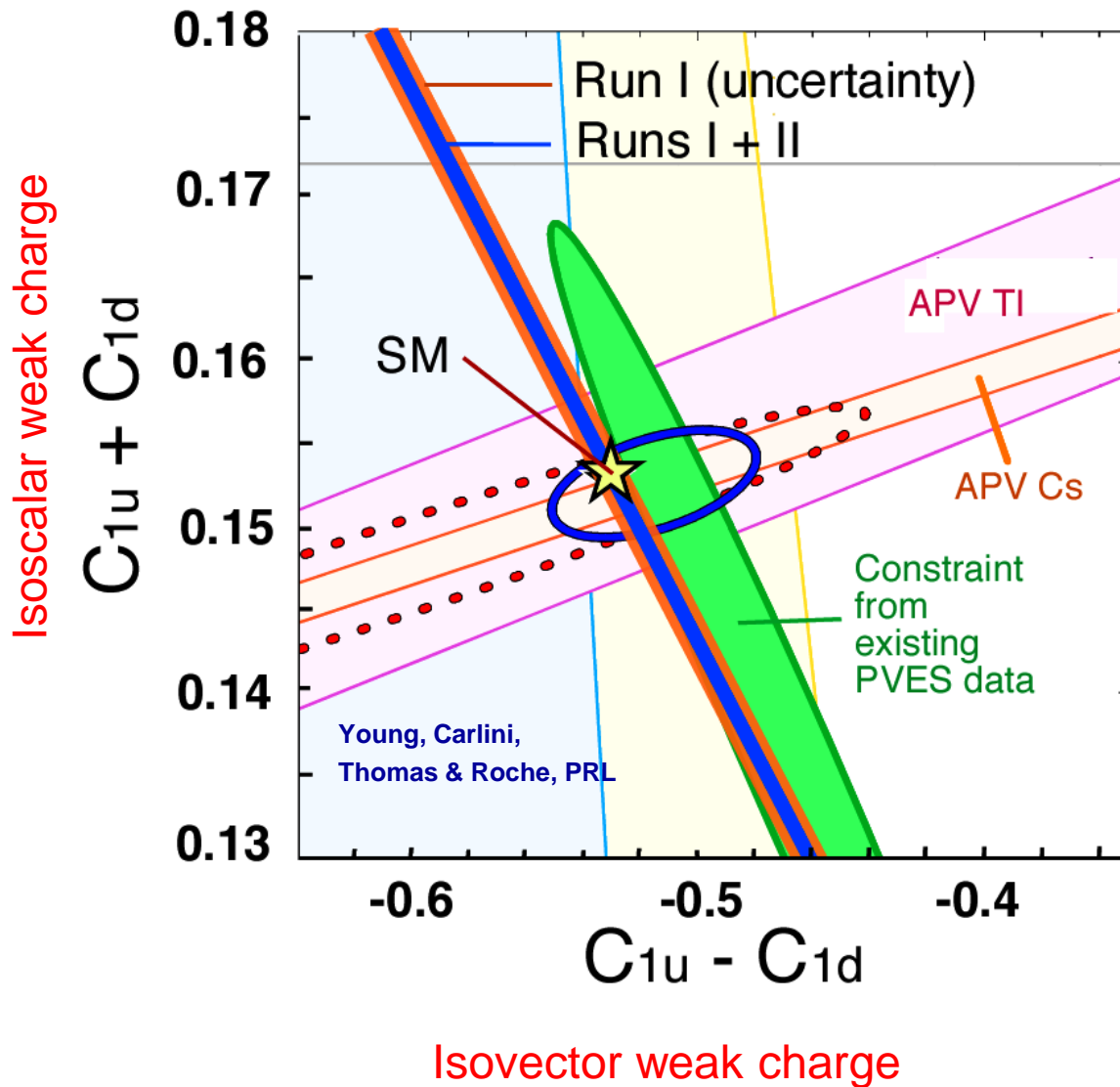


Measuring the Proton's Weak Charge

$\Delta A/A$ Projections (assumes 235 ppm MD, 87% pol)



Run I and Run II Anticipated Uncertainties



$$Q_W^P = -2(2C_{1u} + C_{1d})$$

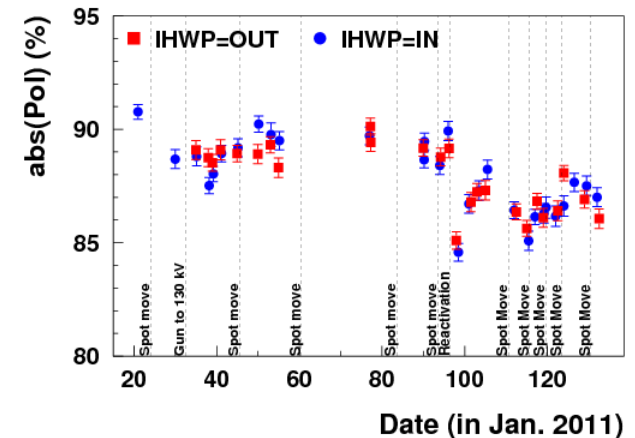
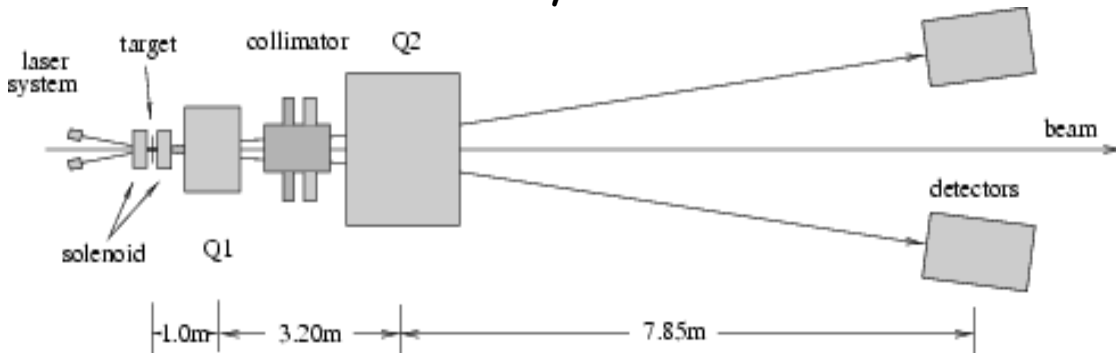
Anticipated constraints if Q_W^P is consistent with the Standard Model.

Run I Polarimetry: Preliminary

Recall $A_{\text{physics}} = A_{\text{experimental}}/P$. Goal is a 1% determination of P using:

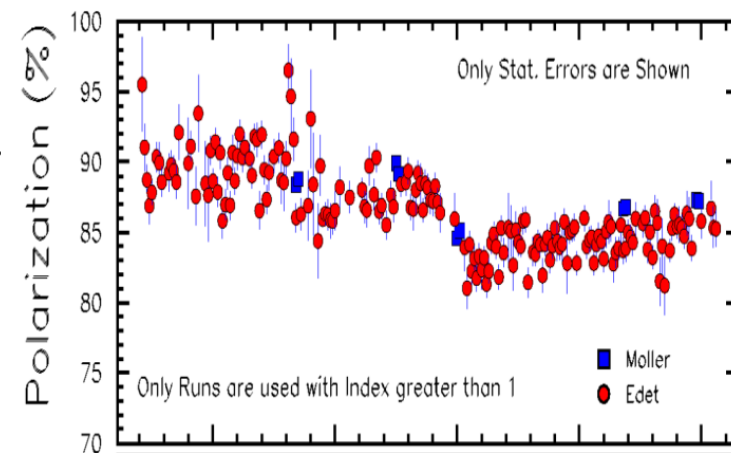
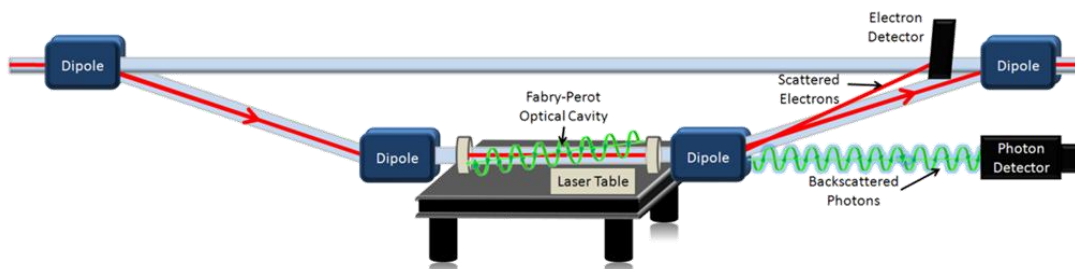
1. Basel-Hall Moeller $e+e \rightarrow e+e$ polarimeter

Invasive. 0.75% accuracy at a few microA.



Compton $\gamma+e \rightarrow \gamma+e$ polarimeter

Non-invasive. Continuous at full production current.



SOS Removal

- SOS must be removed for 12 GeV
- Detectors, electronics, power, cables, AC, hydraulic plumbing removed. Cables to be reused for SHMS.
- Removed lead lined walls of electronics hut. doors, roof, lead lining.
- Detector hut lead panels to be removed.



Summer shutdown work

- **Qweak maintenance**
 - Rebuild target pump, replace windows
 - Minor main detector and region II chamber work
- **Disassemble HKS spectrometer and move to storage**
- **Large Moller Polarimeter quadrupole has unstable coil**
 - Attempts to repair in place unsuccessful
 - Partial beamline disassembly in progress to remove quad and repair or replace



Approved 12 GeV Hall C Experiments – Pre PAC38

Number	Experiment	Grade	Approved Days	Proposed Days	Non-standard Equipment			
E12-06-101	FPI-12	A	52					
E12-06-104	SIDIS R	A-	40					
E12-06-105	x>1	A-	32					
E12-06-121	He3 g_2	A-	29		Polarized He3 target			
E12-07-105	(e,e'π) Factorization	Approved			36			
E12-09-011	(e,e'K) Factorization	Approved			39			
E12-09-017	SIDIS P_t	Approved			32			
E12-09-002	CSV	Approved			22			
E12-10-002	F2 @ large x	B+	13					
E12-10-003	d(e,e'p)	B+	21					
E12-10-008	EMC	A-	23					
E12-06-107	Transparency	B+	26					
E12-06-110	He3 A1n	A	36		Polarized He3 target			
E12-11-002	He4(e,e'pol(p))	B+	37		FPP in HMS			
E12-11-009	GEn	B+	50		Magnet + Neutron polarimeter			
			359		129			
Total		488 Days	5.6 Years	@	25 Weeks/year			
					Schedule 2 days / PAC day			

SHMS-HMS Users Group Board elections

- 6 Member board
 - John Arrington ANL 9/2012
 - Donal Day UVA 9/2013
 - Tanja Horn CUA 9/2012
 - Garth Huber Regina 9/2011
 - Mark Jones JLab 9/2013
 - Ioana Niculescu JMU 9/2011
- Ongoing elections – voting deadline **9AM EDT, Aug 29, 2011**
- Candidates:
 - Eric Christy HU
 - Pete Markowitz FIU
 - Ioana Niculescu JMU
 - Steffen Strauch USC
- Send ballots to huberg@uregina.ca

Notes

Thanks to SHMS-HMS Users group board for organizing this workshop

Please send slides in advance of talks for benefit of remote viewers. Slides from this meeting will be posted on agenda web page. Please email slides to saw@jlab.org in advance of talk.

Agenda change: 4:45 today, discussion of SHMS/HMS analysis software.

Postdoc position open.

Hall C Party tonight 7PM