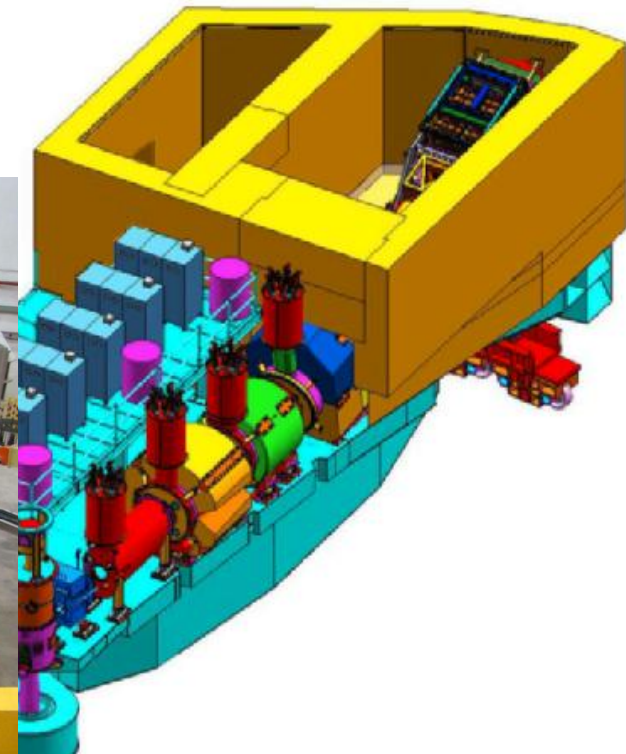
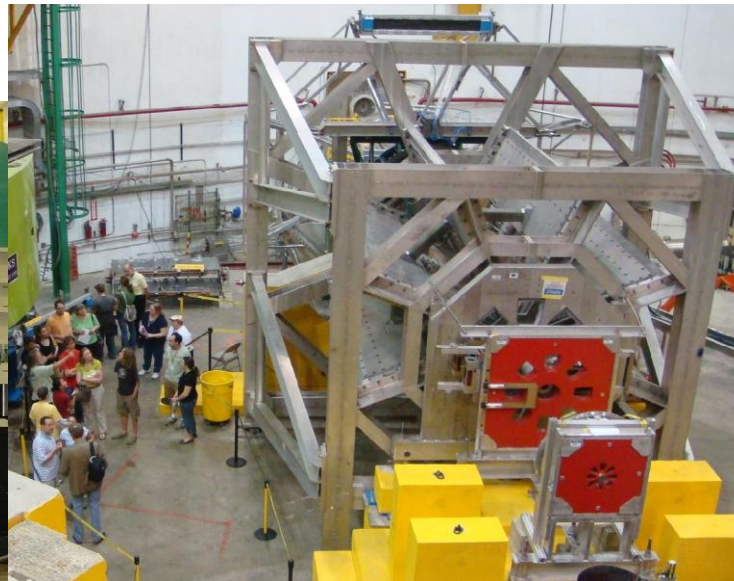
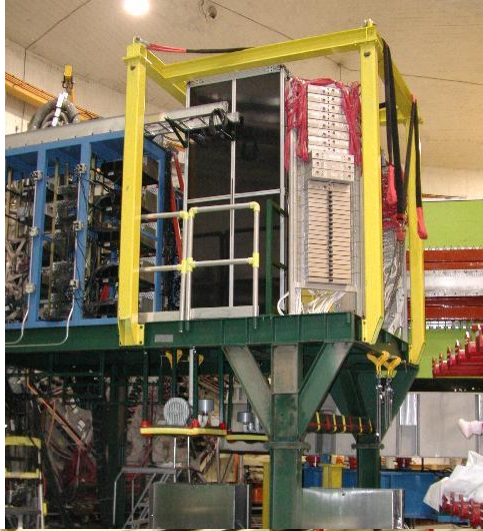


## Hall C User Meeting

January 14-15, 2011



# Publications in last year

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
E04-108	Recoil polarization measurements of the proton electromagnetic form factor ratio to $Q^2 = 8.5 \text{ GeV}^2$	PRL 104, 242301
	Empirical fit to precision inclusive electron-proton cross sections in the resonance region	PRC 81, 055213
E01-107	Exp. Study of the $A(e, e' \pi^+)$ Reaction on $^1\text{H}$ , $^2\text{H}$ , $^{12}\text{C}$ , $^{27}\text{Al}$ , $^{63}\text{Cu}$ and $^{197}\text{Au}$	PRC 81, 055209
E99-118	Proton and deuteron $F_2$ structure function at low $Q^2$	PRC 81, 055207
E00-116	Confirmation of quark-hadron duality in the neutron $F_2$ SF	PRL 104, 12001
	New parton distributions from large- $x$ and low- $Q^2$ data	PRD 81, 034016
G0	Strange Quark Contributions to Parity-Violating Asymmetries In the Backward Angle G0 Electron Scattering Experiment	PRL 104, 012001
G0	G0 NIM Paper	Submitted
E04-019	Search for effects beyond the Born approximation ... (GeP-2 $\gamma$ )	Arxiv: 1012.0339

Total Publications: 88

PRL: 34

NIM: 10

77 "Hall C" PhDs to date, 7 in last year

# 6 GeV Publication Status - I

Exp #	Topic	Done	Papers	Extra Papers	Notes
E94-110	(e,e') R	10/1999	Draft Nucl-ex/0410027	P Elastic, spin offs	
E91-016	(e,e'K)	12/1999	PRL 12/2004 PRC 11/2007	Omega production	
E89-009	HNSS	5/2000	PRL 6/2003 PRC 4/2006		
E99-118	Nuclear R	7/2000		Proton and Deuteron	
E93-038	GeN (Madey)	4/2001	PRL 9/2003 PRC 2/2006	GeP/GmP	
E93-026B	GeN Poltar	12/2001	PRL 1/2004		
E01-006	RSS	3/2002	PRL 3/2007 PRL 9/2010		Possible Neutron SF
E00-002	F2N low Q2	5/2003	Draft		
E01-002	Baryon	6/2003	PRC 6/2009 PRC 9/2009		

# 6 GeV Publication Status - II

Exp #	Topic	Done	Papers	Extra Papers	Notes
E00-116	Intermediate Q2 duality	7/2003	PRC 9/2009		
E01-004	Fpi – II	8/2003	PRL 10/2006 PRCx2 10/2008		
E00-108	Meson Duality	8/2003	PRL 1/2007 PRB 7/2008		Draft of Long Paper
E00-006	G0 Forward	5/2004	PRL 8/2005 PRL 8/2007	Target NIM Global Analysis	
E02-019	X>1	11/2004	PRL 11/2010		Ratios TBS
E03-103	EMC Effect	11/2004	PRL 11/2009		Archival
E93-008	J/Psi	12/2004	PRL 1/2009		
E01-107	Pi Transparency	12/2004	PRL 9/2007 PRC 5/2010	Scaling study	
E01-011	HKS	11/2005			
E02-017	Photofission	12/2005	P of Atom 10/2010		



# 6 GeV Publication Status - III

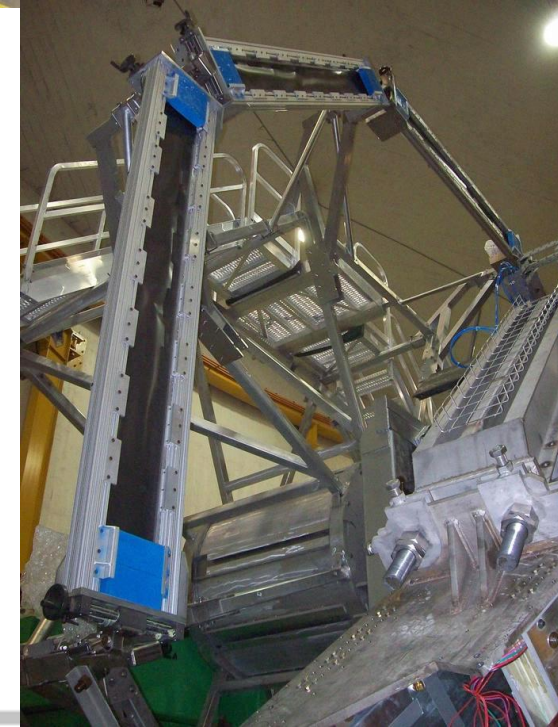
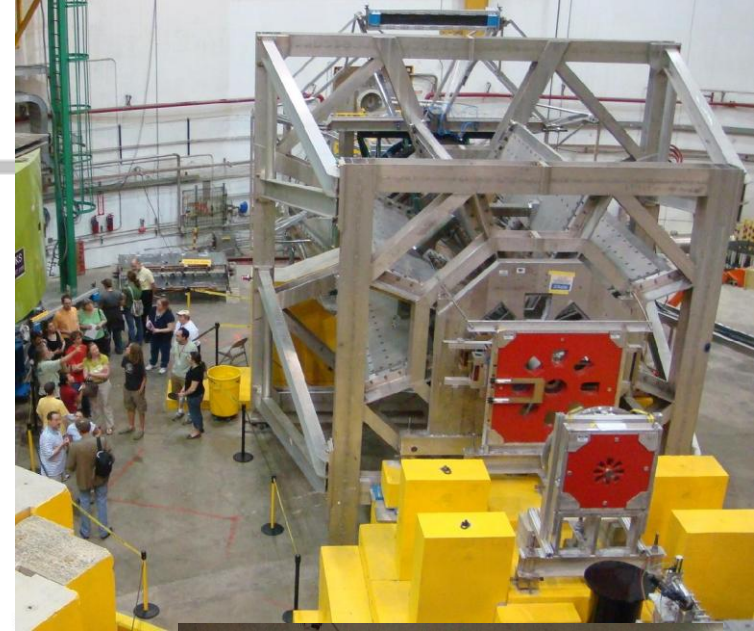
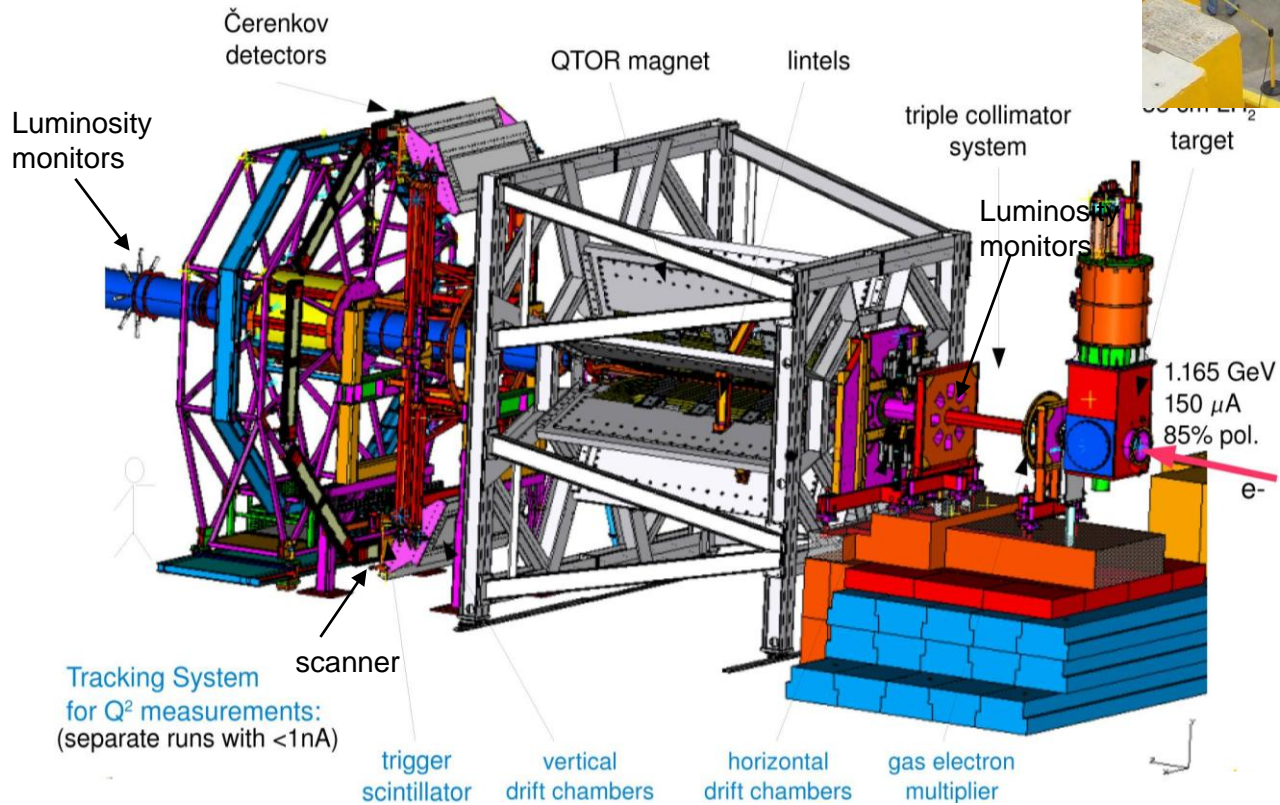
Exp #	Topic	Done	Papers	Extra Papers	Notes
	G0 Backward	3/2007	PRL 1/2010	NIM Submitted	Transverse Asymm Draft
E04-001	F2/R Nuclei	7/2007			
E05-017	2gamma	7/2007			
E06-009	F2/R Deut.	7/2007			
E04-019	GeP-2gamma	1/2008	Submitted		
E07-002	RCS	1/2008			
E04-108	GeP-III	6/2008	PRL 6/2010		
E07-003	SANE	3/2009			
E05-115	HES/HKS	11/2009			

# 12 GeV Hall C Experiments

	asdf	Grade	Approved Days	Proposed Days					
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 <sub>2</sub>	A-	29						
E12-07-105	(e,e'π) Factorization	Approved		42					
E12-09-011	(e,e'K) Facotrization	Approved		47					
E12-09-017	SIDIS P <sub>t</sub>	CA		32					
E12-09-001	GEp	CA		98					
E12-09-002	CSV	CA		22					
E12-10-002	F2 @ large x	B+	13						
E12-10-003	d(e,e'p)	B <sub>-</sub>	21						
E12-10-008	EMC	A-	23						
E12-06-107	Transparency	B+	26						
E12-060110	He3 A1n	A	36						
PR11-002	He4(e,e'pol(p))			37					
PR11-009	GEn			67					
			272	345					
Total		617 Days	7.1 Years	@	25 Weeks/year				

# Qweak

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





# Schedule Overview

Present – May 13, 2011 (or March 31?)  
Qweak commissioning and running

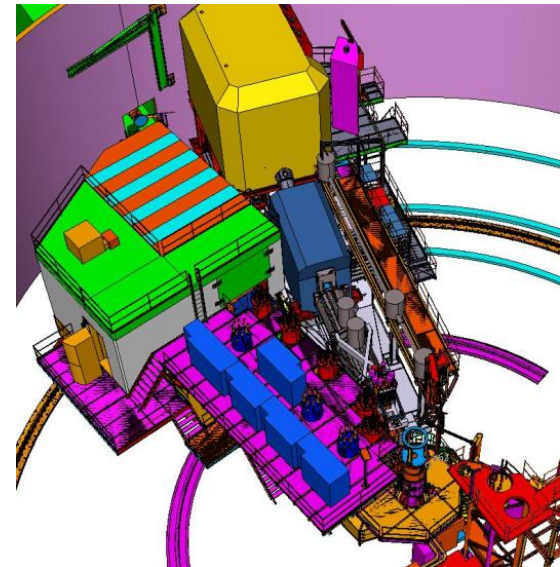
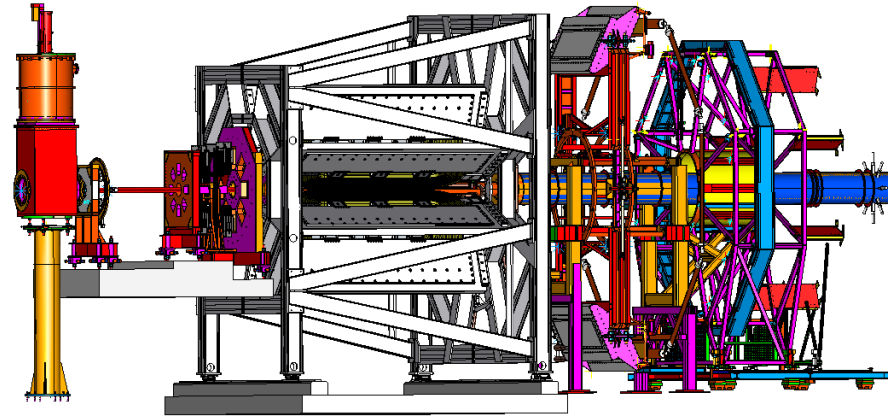
May 13, 2011 – November 18, 2011  
6 month down  
SOS decommissioning

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  
Start of commissioning





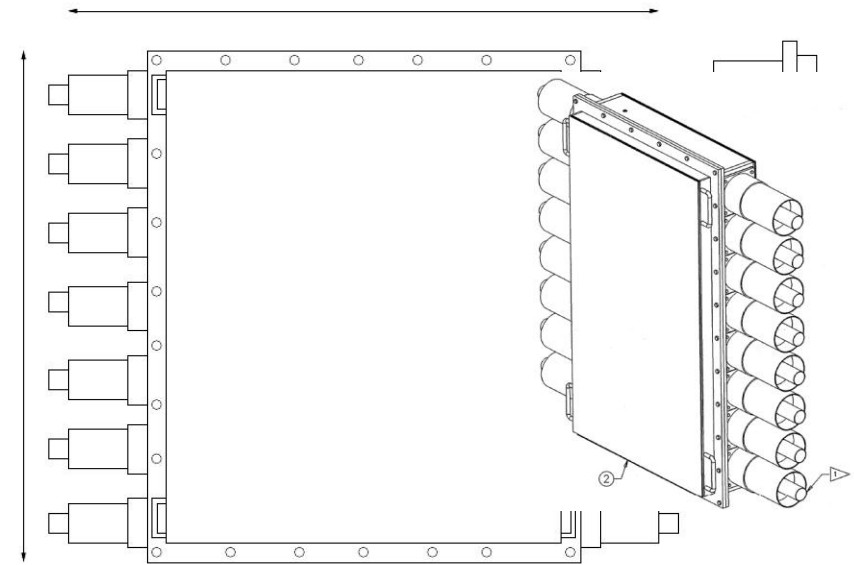
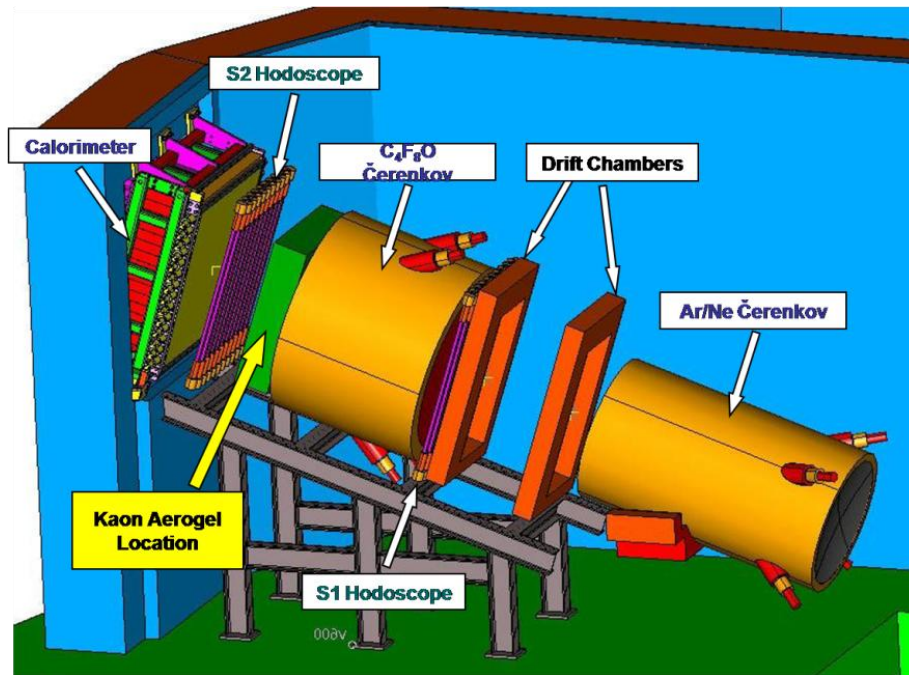
# SOS Removal

- SOS must be removed for 12 GeV
- Detectors, electronics, power, cables, AC removed.
- Summer 2011, remove doors, roof, lead lining.



# SHMS Aerogel

MRI Funded: The Catholic University of America, University of South Carolina,  
Mississippi State University, Florida International University, Yerevan, JLab



SHMS aerogel (two exchangeable aerogel trays)

Based on HMS design. Initial Aerogel -  $n=1.03$ ,  $n=1.015$

# SHMS-HMS Users Group

Users group founded in 2009 with appointed 6 member board with staggered 3 year terms

First elections August 2010, replaced 2 board members.

John Arrington	ANL	9/2012
<b>Donal Day</b>	<b>UVA</b>	<b>9/2013</b>
Tanja Horn	CUA	9/2012
Garth Huber	Regina	9/2011
<b>Mark Jones</b>	<b>JLab</b>	<b>9/2013</b>
Ioana Niculescu	JMU	9/2011

Pushlishes newsletter on 12 GeV activities

Will organize Hall C summer physics workshops (previously steering committee)

# Notes

2011 Virginia Outstanding Scientist Award – Cynthia Keppel

PAC

PAC37 Closeout today. Will present results ~ 4PM today

Summer PAC likely, date TBD

Slides/Documents from SHMS Detector Progress meeting available in Hall C DocDB.

Slides from this meeting will be posted on agenda web page. Please email slides to saw or leave on conference PC

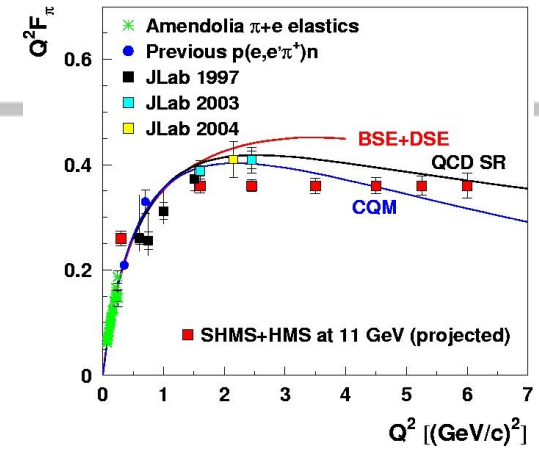
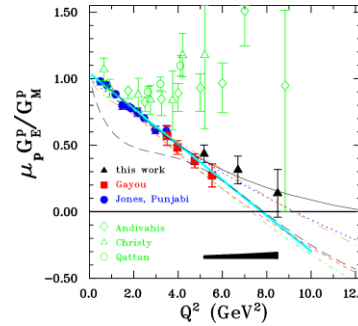
Hall C Party tonight 7PM



# Hall C Physics

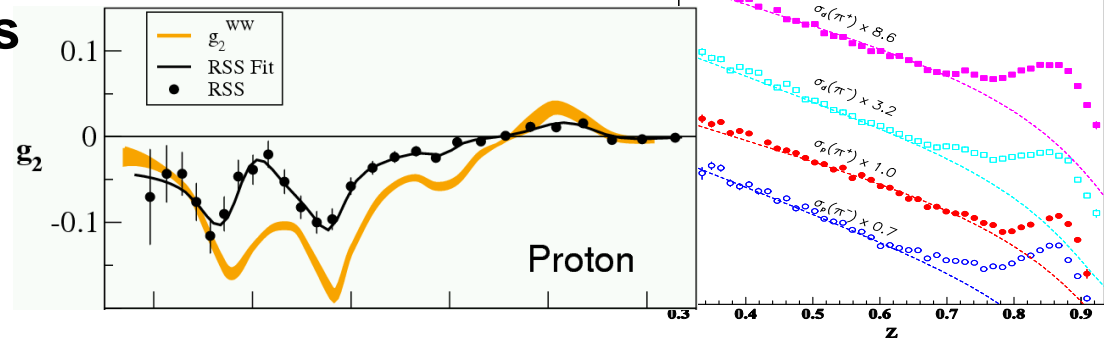
## Form Factors

- Nucleon:  $G_E$ ,  $G_M$
- Strange quark contributions
- Deuteron: T20
- Pion:  $F_\pi$
- Baryon transition form factors



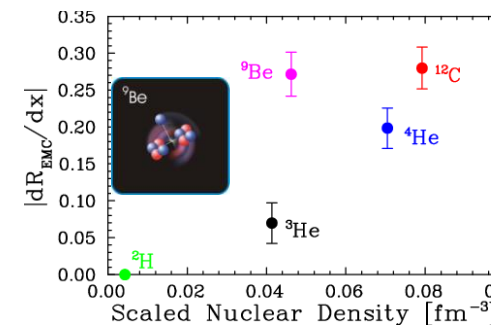
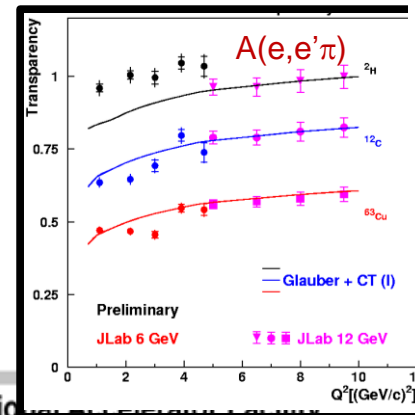
## Nucleon Structure Functions

- Unpolarized  $p(e,e')$ ,  $d(e,e')$ 
  - Duality, high  $X$
  - Semi-inclusive  $p, d(e,e'\pi)$
- Polarized structure functions
  - $g_1$ ,  $g_2$  on polarized  $p$ ,  $d$



## Nuclear structure/effects

- Hypernuclear structure
- EMC effect
- $x > 1$  – high momentum in nuclei
- Pion and proton transparency (attenuation) in nuclei



# Hall C after 12 GeV Upgrade

- Beam Energy: 2 – 11 GeV/c
- Super High Momentum Spectrometer (SHMS) (**NEW**)
  - Horizontal Bender, 3 Quads, Dipole
  - $P \rightarrow 11$  GeV/c
  - $dP/P$   $0.5 - 1.0 \times 10^{-3}$
  - Acceptance: 5msr, 30%
  - $5.5^\circ < \theta < 40^\circ$
- High Momentum Spectrometer (HMS) (**EXISTING**)
  - $P \rightarrow 7.5$  GeV/c
  - $dP/P$   $0.5 - 1.0 \times 10^{-3}$
  - Acceptance: 6.5msr, 18%
  - $10.5^\circ < \theta < 90^\circ$
- Ideal facility for:
  - Rosenbluth (L/T) separations
  - Exclusive reactions
  - Low cross sections (neutrino level)
- Minimum opening angle:  $17^\circ$
- Well shielded detector huts

