Hall-C Summer Physics Workshop

August 18-19, 2005

CC L102-104

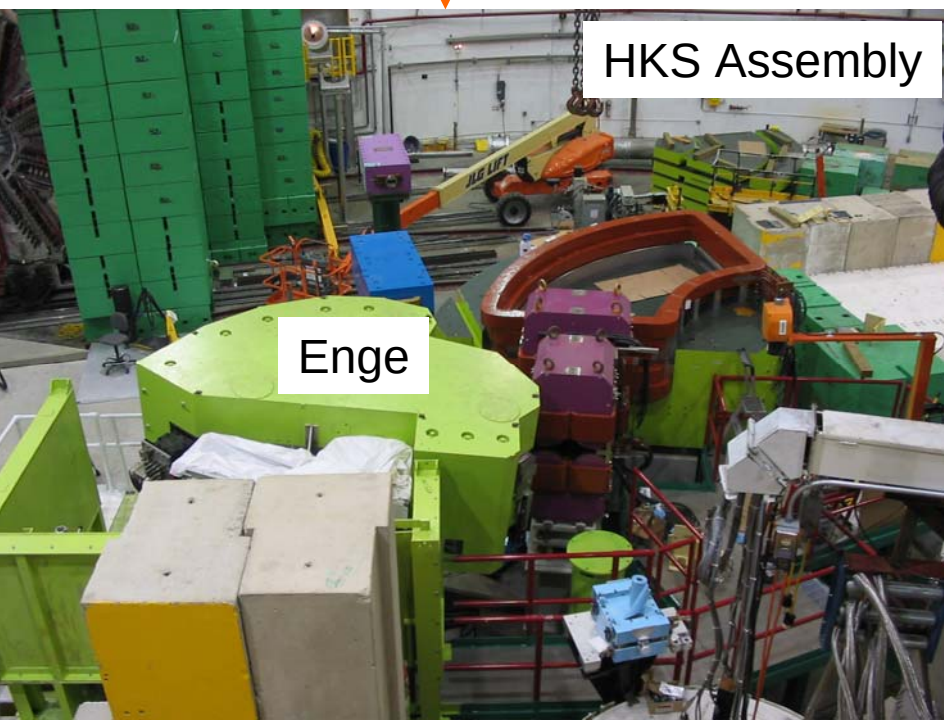
Hall C Research Program

- Have been running experiments since November 1995
- 594 PAC Days run, or 28.3 experiments (September 1, 2005)
- 280 PAC Days in queue, or 11.7 experiments
  (7 large-scale installations)
  (Backlog: 4.0 Years)
- 70 Ph.D. Subjects, 51(!) Ph.D.'s awarded
- 38 refereed publications to date (20 PRL), 5 submitted
  (not including NIM papers)
- 7 Large Installations to date: t_{20}, G_E^n-98, HNSS, G_E^n-00, G_E^n-01, G0 (x2), HKS
- ~400 Active users representing 19 different countries

Present Installation: HKS

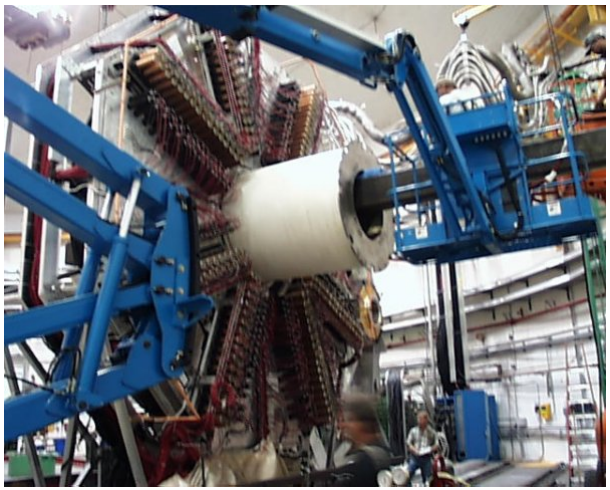
Present Hypernuclear Spectroscopy equipment combination is beam splitter, Enge (e^-), HKS (K^+)

Installation ongoing in Hall C (April 13)

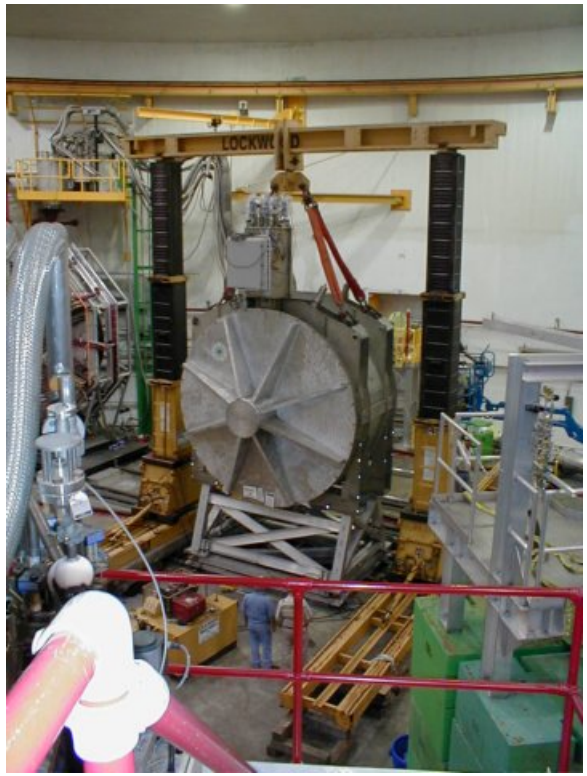


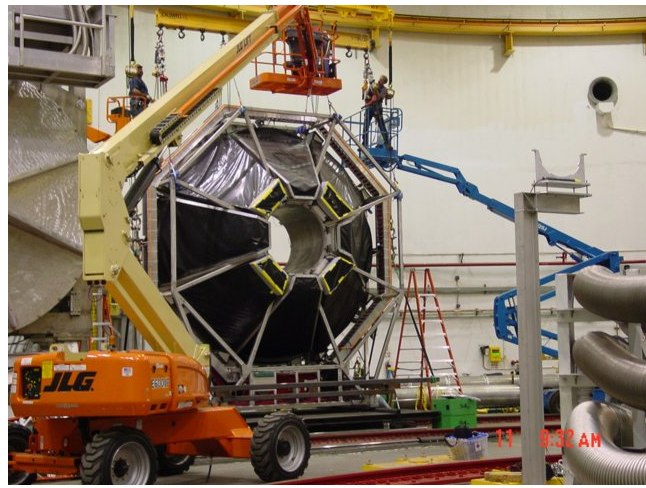
Installation completed (early June)

GO Turnaround : August/September 2004

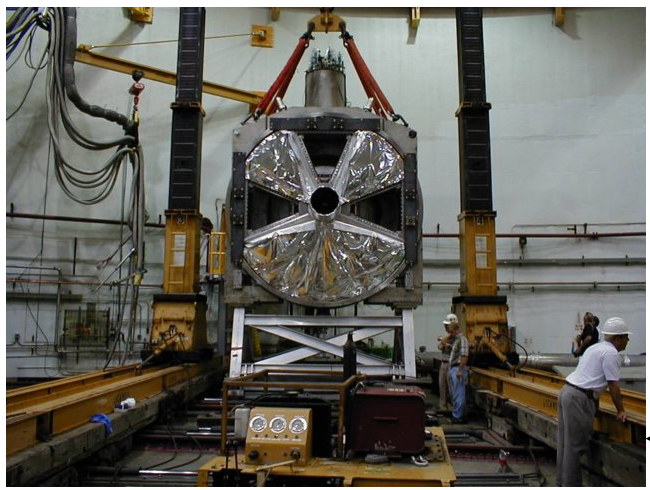


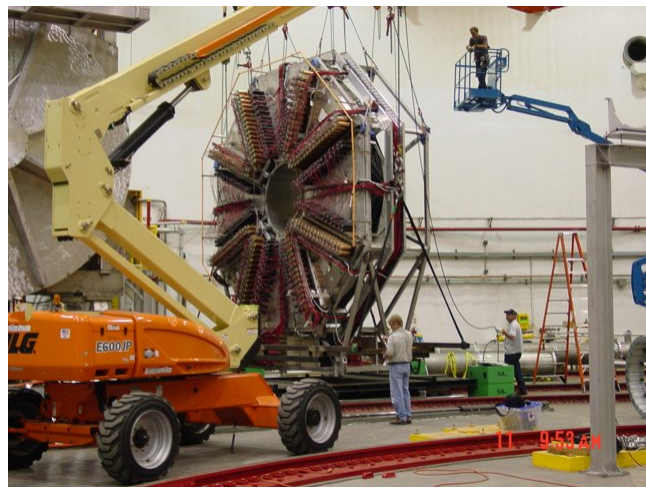
Aug. 04: Collimator Removal (Hall C)





Aug. 04: Ferris Wheel Rotation (Hall C)

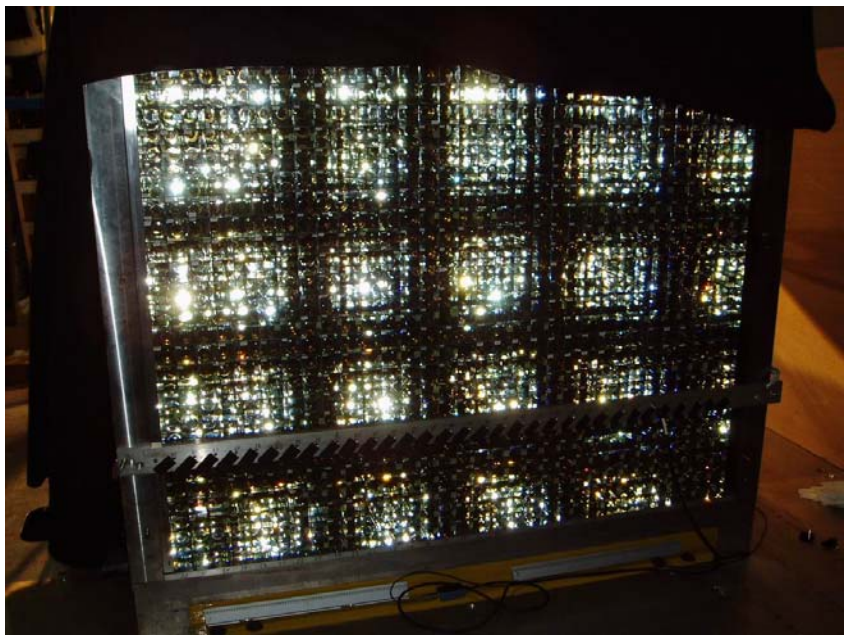




Sep. 04: SMS Rotation (Lockwood)

GEp-III Status (G_E^p/G_M^p up to Q^2 = 9 GeV^2)

All 1744 bars have been installed in the large calorimeter. The HV/electronics and cabling are on separate frames to facilitate installation.



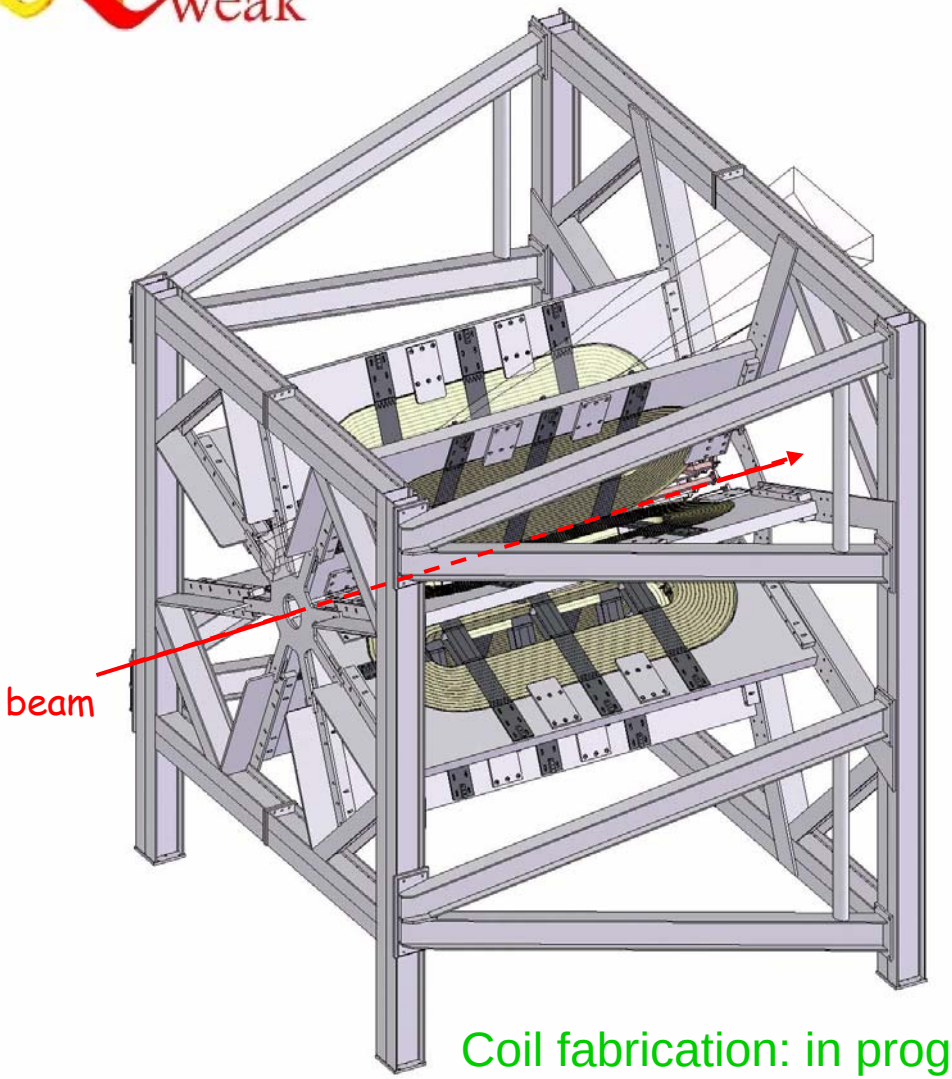
The Dubna/Protvino prototype chamber + electronics for the FPP has been fully tested. All four chambers are now at JLab and being tested. The FPP stand design is complete.

Anticipated "Ready" Date: End 2005

(above) aerial photo of GEp-III space in Test Lab

Qweak Toroidal Magnet (QTOR)

- 8 coils 4.5m long along beam
- Pb shielding between coils
- Coil holders & frame all Al
- $\int B \cdot dl \sim 0.7$ T-m
- ~ 9500 A



First Qweak Coil (double pancake) in potting mold (July '05)

Coil fabrication: in progress. Stand award: expected 8/05.

Hall C PAC-25/26/27 Summary

PAC 25:	Days Requested	155 days (9 experiments)
	Jeopardy	0 days (0 experiments)
	Approved	23 days (2 experiments)
PAC 26:	Days Requested	257 days (11 experiments)
	Jeopardy	110 days (4 experiments)
	Approved	160 days (5 experiments)
PAC 27:	Days Requested	271 days (7 experiments)
	Jeopardy	23 days (1 experiment)
	Approved	48 days (2 experiments)

Over last three PAC's: 25 + 135 + 23 days to approve
155 + 257 + 271 days requested

→ about 25% can be approved (34% was approved)

→ The PAC again "mortgaged" the next PAC-28 allocation

PAC28:	Days Requested	172 days (4 experiments)
	Jeopardy	9 days (1 experiment)

Experimental Program since 2004 Workshop

Exp	Title	Spokespersons
E02-019	$x > 1$ at high Q^2	J. Arrington, D. Day, B. Filippone, A. Lung
E03-103	EMC Effect in Light Nuclei	J. Arrington, D. Gaskell
E03-008	Subthreshold J/Psi Photoproduction	P. Bosted, J. Dunne
E01-107	Pion Transparency in Nuclei	D. Dutta, R. Ent, K. Garrow
E02-109 Part I (1/3)	Measurement of $R = \sigma_L/\sigma_T$ on Deuterium in the Resonance Region	M.E. Christy, C. Keppel
E04-001 Part I (1/3)	Measurement of F_2 and R on Nuclear Targets in the Resonance Region	A. Bodek, C. Keppel
E01-011 (ongoing)	Spectroscopy Study of Medium to Medium-Heavy Mass Λ Hypernuclei	O. Hashimoto, S. Nakamura, J. Reinhold, L. Tang

- HMS + SOS running until mid-January, 2005
- In January, 2005 installation of the HKS experiment started, followed by an extensive commissioning period

Long-Term Experiment Schedule

2005
- Hypernuclear Physics
  - HKS Experiment (Hashimoto, Nakamura, Reinhold, Tang) (1.8-2.0 GeV)
  - Hypernuclear Life Time Experiment (Hu, Margaryan, Tang)
- Transition to E04-115 Experiment (Beck, G0 Backward)

2006
- G0 Backward Run (0.8 GeV & 0.36 GeV)

2007
- Transition to E04-108 Experiment
- GEp-III Run (Perdrisat, Brash, Jones, Punjabi)
  - 2-γ Exchange Run intermixed?
- HMS/SOS L/T Runs? (Bodek, Christy, Keppel)

2008
- Polarized Target Runs
  - SANE (g_2 at high Q^2) Run (Rondon, Meziani, Choi)
  - Semi-SANE (flavor decomposition) Run (Jiang, Bosted, Day, Jones)

2009
- Qweak (Bowman, Carlini, Finn, Kowalski, Page) Phase I

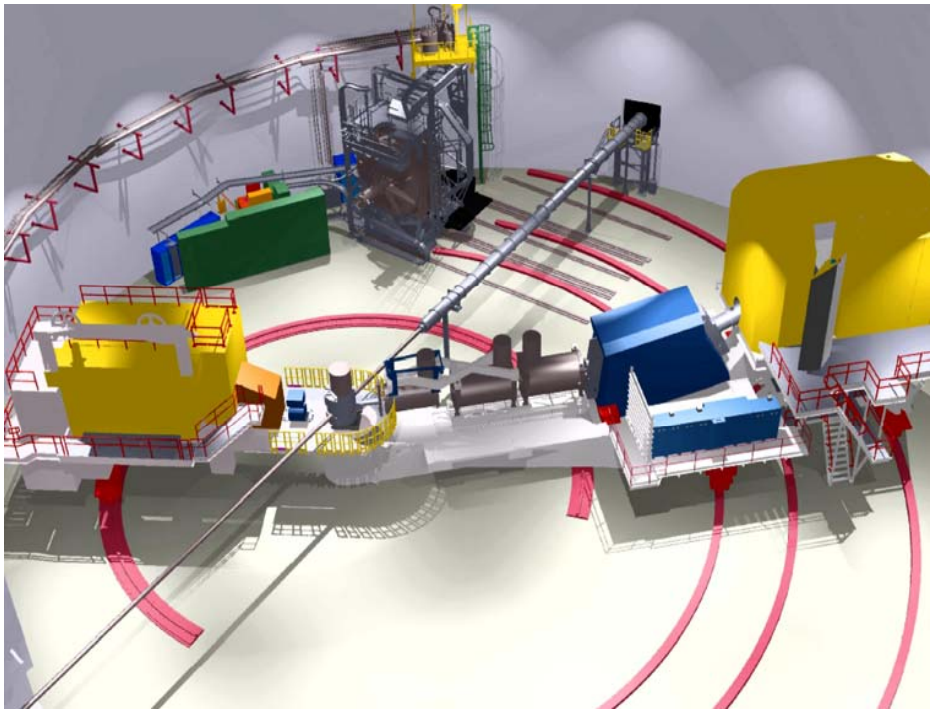
2010
- GEn Run (Madey, Anderson, Kelly, Kowalski, Semenov)
- Qweak (Bowman, Carlini, Finn, Kowalski, Page) Phase II

2012?
- Start 12 GeV program?

Jefferson Lab's

Experimental Hall C

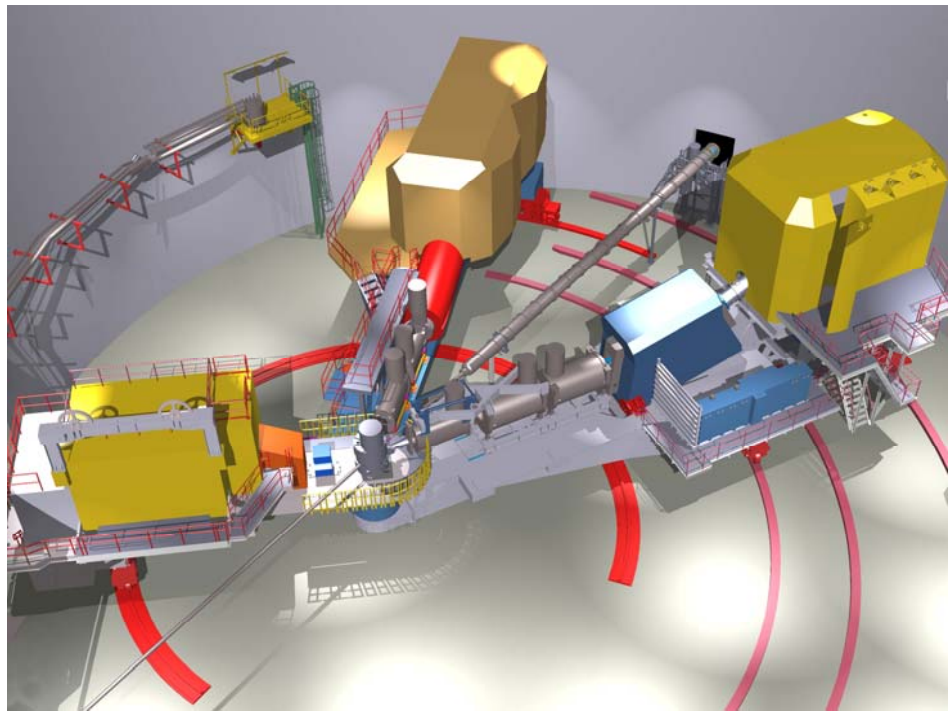
At the present 6 GeV Beam Energy



Hall C's High Momentum Spectrometer, Short Orbit Spectrometer and specialized equipment for studying:

- *The strange quark content of the proton*
- *Form factors of simple quark systems*
- *The transition from hadrons to quarks*
- *Nuclei with a strange quark embedded*

After the 12-GeV Upgrade



Add a Super-High Momentum (11 GeV) Spectrometer for studying:

- *Super-fast quarks*
- *Form factors of simple quark systems*
- *The transformation of quarks into hadrons*
- *Quark-quark correlations*

Hall-C Summer Physics Workshop

- Hall C has no official collaboration structure
- A user community with a Steering Committee
  - Betsy Beise (UMd/NSF)
  - Osamu Hashimoto (Tohoku)
  - Allena Opper (OU)
  - Wim van Oers (Manitoba, Chair)
- Main tasks
  - Provide effective channel of communication
  - Represent the interests of Hall C users and Hall C
  - Organize annual Hall C physics workshop
- January Hall C "nuts + bolts" User Meeting:
  January 05 + 06 (?)

Summer Physics Workshop: August 18 + 19

- Strangeness content of the nucleon		
Strangeness in the Nucleon – Overview	Ross Young (Jlab)	45+15
G0: Strange Quark Contributions	Greg Smith (JLab)	25+ 5
HAPPEx: Results and Outlook	Kent Paschke (UMass)	25+ 5
MAMI-A4: Results and Outlook	Simon Taylor (Ohio)	25+ 5
- Hypernuclear Physics		
Hypernuclear Spectroscopy – Overview	D. John Millener (BNL)	45+15
The HKS Program at JLab	Mizuki Sumihama (Tohoku)	25+ 5
Strangeness Condensation and Neutron Stars	Juergen Schaffner-Bielich (Fr.)	45+15
- Flavor decomposition at 12 GeV		
Flavor Decomposition at LO	Harut Avakian (JLab)	25+ 5
Limitations of Flavor Decomposition at LO	Christian Weiss (JLab)	25+ 5
The 12 GeV Upgrade and SHMS	Antje Bruell (JLab)	25+ 5
- Tests of the Standard Model		
Electroweak Measurements: Tests of the Standard Model	Jens Erler (UNAM)	35+10
Tests of the Standard Model: Below the Z0 Pole	Krishna Kumar (UMass)	35+10
Transition form factors		
Lattice QCD: Status and Outlook	Constantia Alexandrou (Cyprus U)	50+10
Nucleon Form Factors at JLab	Mark Jones (JLab)	25+ 5
The N-Δ Transition at High Q^2	Anthony Villano (RPI)	25+ 5
The Pion Form Factor	Tanja Horn (UMd)	25+ 5
-Structure Functions at large x		
The Impact of PDFs at Large x	Jeff Owens (FSU)	45+15
Measurements of F_2 at Large x	Simona Malace (HU)	25+ 5
Spin Structure Functions at Large x	Alexandre Deur (JLab)	35+10
Moments of Structure Functions and Glue	Cynthia Keppel (JLab)	25+ 5