Hall C Status

January 2026 Winter Hall C Collaboration Meeting

Mark Jones
Hall A/C Group Leader

Dave Gaskell
Hall A/C Deputy Group Leader

Jan 2026

Hall C operation in 2025

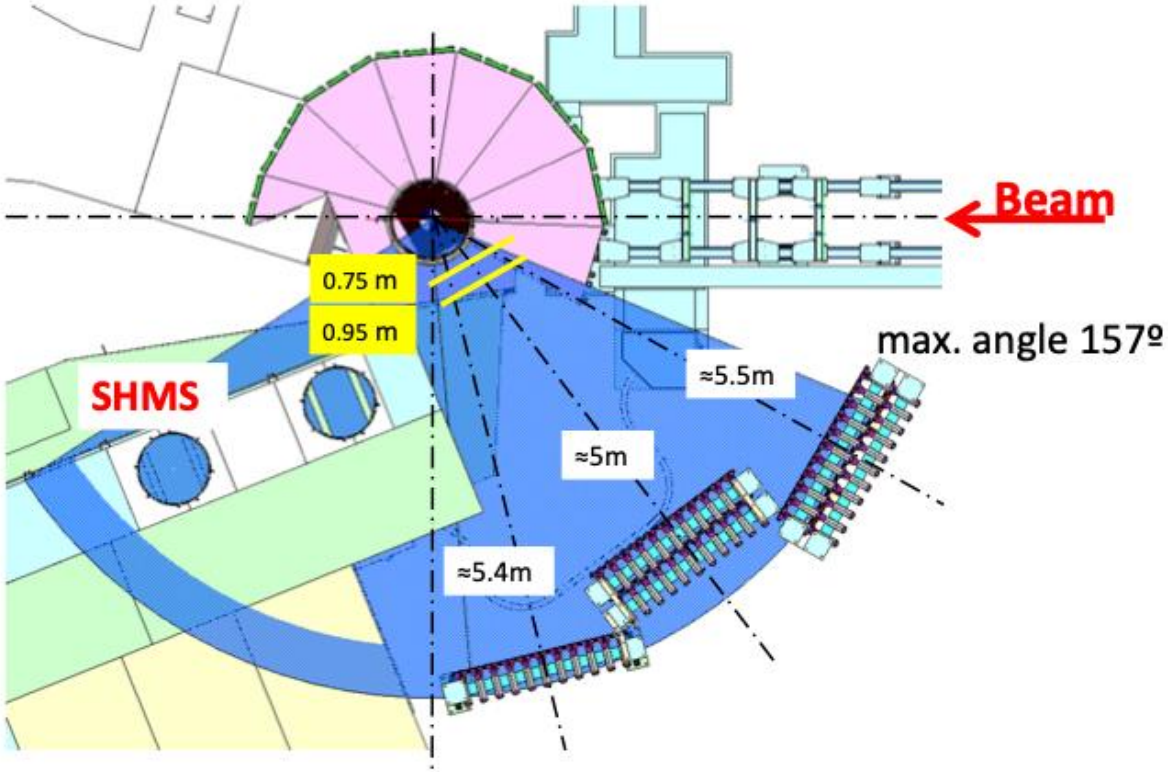
- Decision to shorten FY25 run period to 22 weeks. Got 2 week extension to Sept 3rd.
- Accelerator was at 87% efficiency for beam to any hall.
- E12-11-107 Spectator tagged DIS d(e,e'p_s) started on April 3rd 2025.
  - On April 21st , Hall C 480-volt switchboard had a short circuit. Also caused fuses in transformer upstream of switchboard to be blown.
  - Hall C had power restored and back to beam on Friday May 9th.
  - Shifted the schedule to complete the LAD experiment by July 14th.
- Second set of experiments was about 3 calendar months (94 calendar days)
  - E12-06-104 $R=\sigma_L/\sigma_T$ in SIDIS $\pi^{+/-}$ on 1H and 2H
  - E12-24-001 Nuclear Dependence (C,Cu) of R in SIDIS
  - Completed half of the calendar days the 2025 run period.
  - Will run the rest of the experiment in the 2026 run period

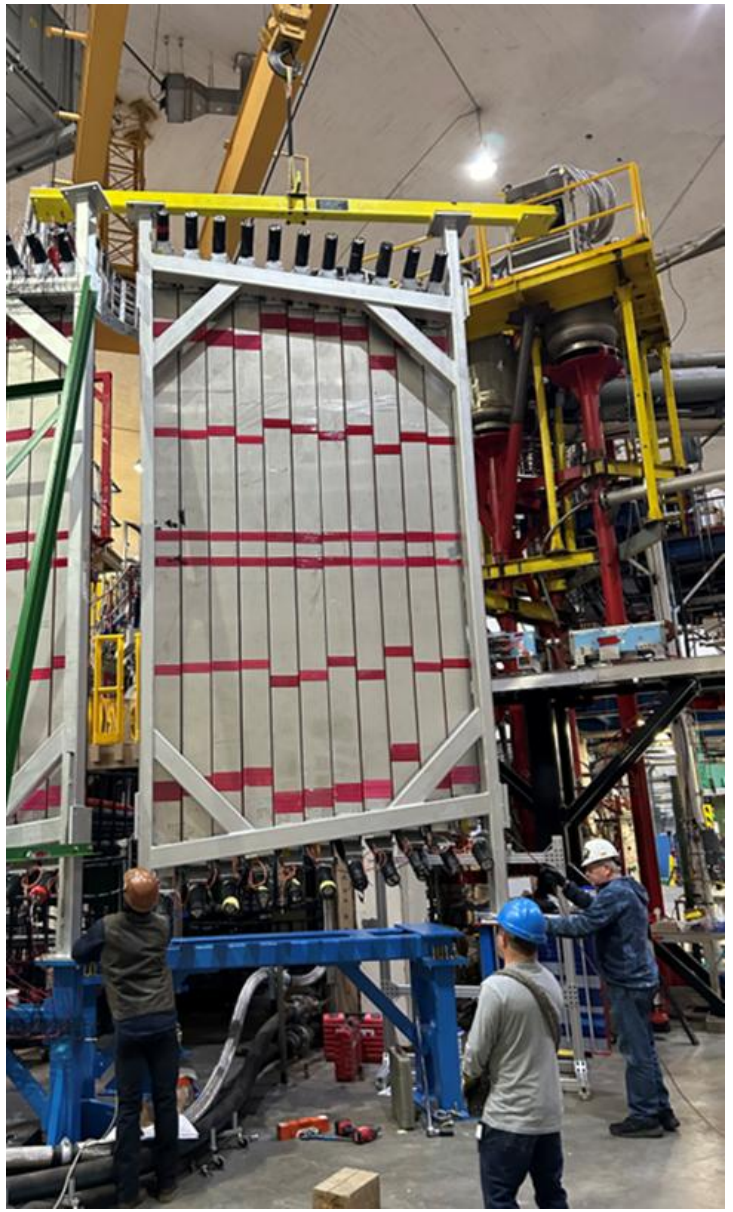
Hall C FY25 run: LAD

LAD (E12-11-107) experiment running completed Monday, July 14

→ Dedicated detectors installed to tag high momentum, spectator protons in backward direction

→ Measure modification of F_2^n in deuteron at large virtuality (missing momentum)



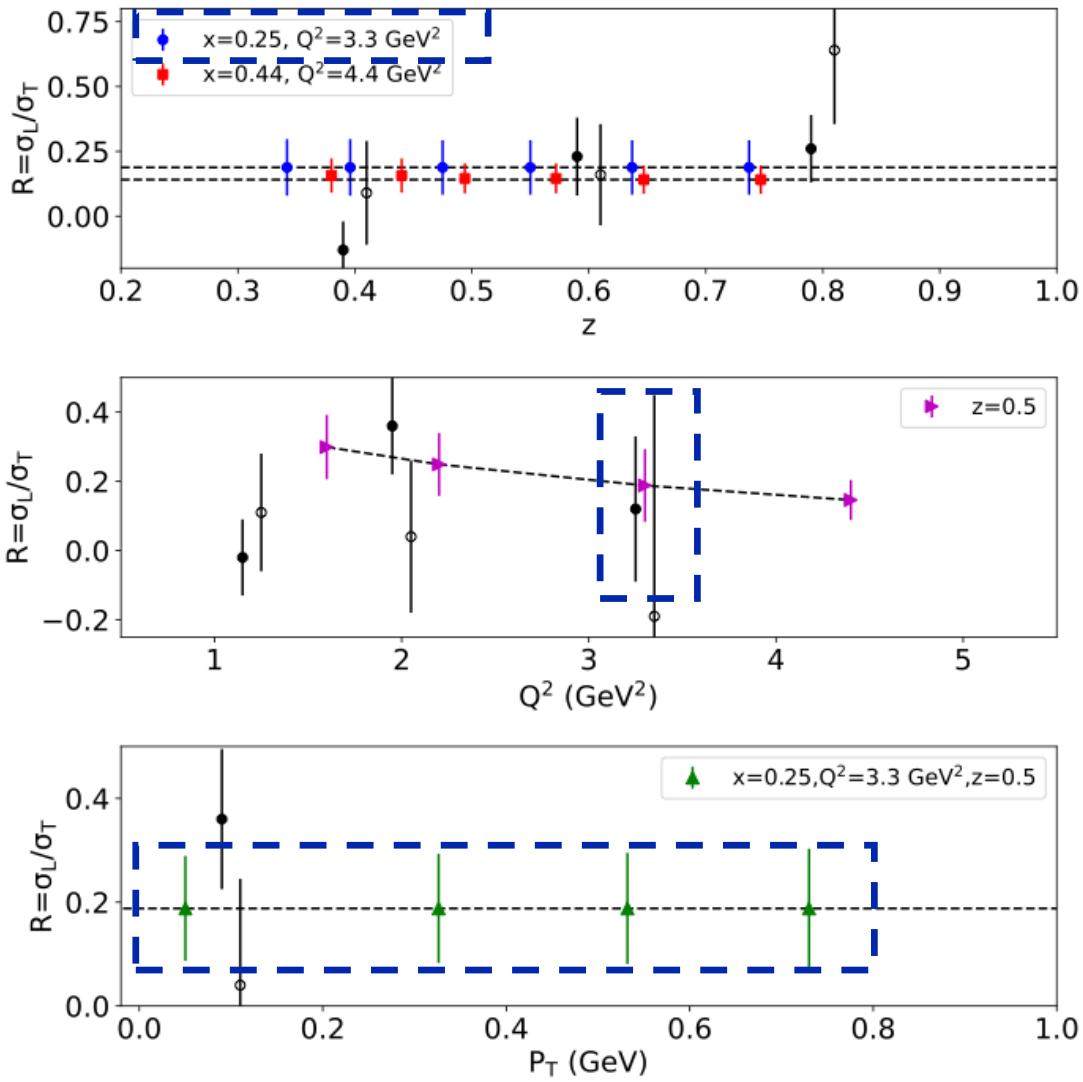


Hall C FY25 run: R-SIDIS

First half of R-SIDIS experiments (E12-06-104 and E12-24-001) completed

Goal: Measure $R=\sigma_L/\sigma_T$ in SIDIS, nuclear dependence

→ Took data at 2 beam energies (epsilon settings) for x=0.25, Q^2=3.3 GeV^2
  → z-scan for π+ and π- from H, D, C, Cu
  → P_T scan at z=0.5 for p+ from H, D, C, Cu
  → Measurements at z=1 for kinematics/radiation correction models input
→ Experiments will be completed during 2026 run
  → z-scan at x=0.44
  → complete x/Q^2-scan at z=0.5



Jefferson Lab

Hall C Running in 2026

- Preparing for lab furlough with government shutdown in Oct/Nov
  - 3 week delay to beam start
- Machine has completed the 2K cool down in January 2026
- Accelerator on tight schedule to meet Physics beam start date.
- Physics beam with staggered start:
  - Fri March 13th Hall B, Mon March 16th Hall D and Wed March 18th Hall C
- Accelerator will start at low pass energy of 345 per linac for compatibility w/PRAD
  - E12-22-001: N-Δ at low Q^2
  - E12-23-001: VCS at low Q^2, 15 of 61 PAC days
- Two weeks for accelerator changeover to standard beam energies
  - Switchover is May 11 to May 25. With end of beam on August 17.
  - E12-06-104/E12-24-001: R-SIDIS (Part 2)
  - E12-06-107: Color Transparency via exclusive pion electroproduction
- Testing of SoLID detectors will be done parasitically during the run period.

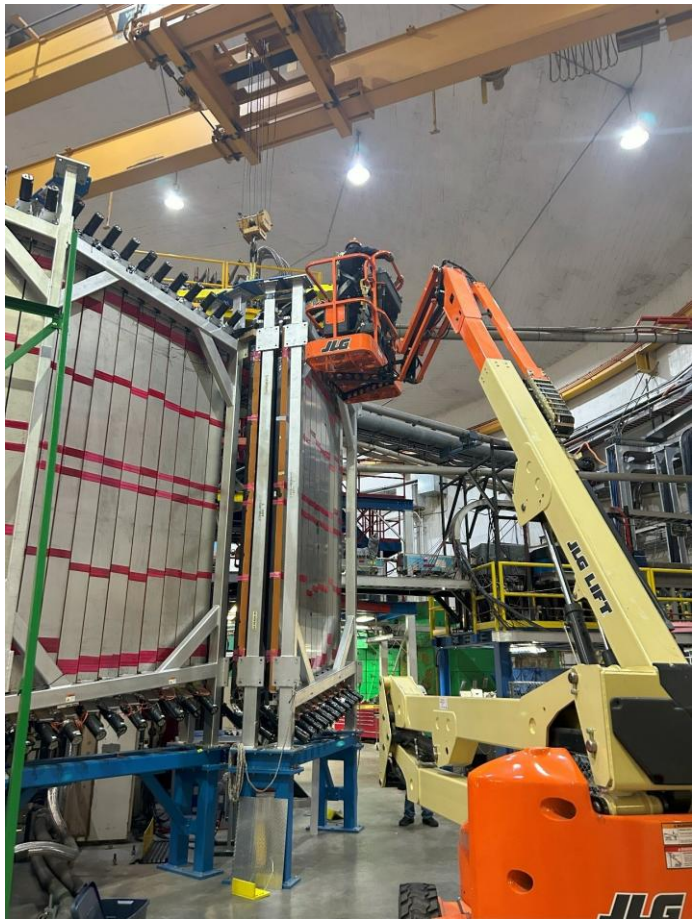
Hall C during the SAM

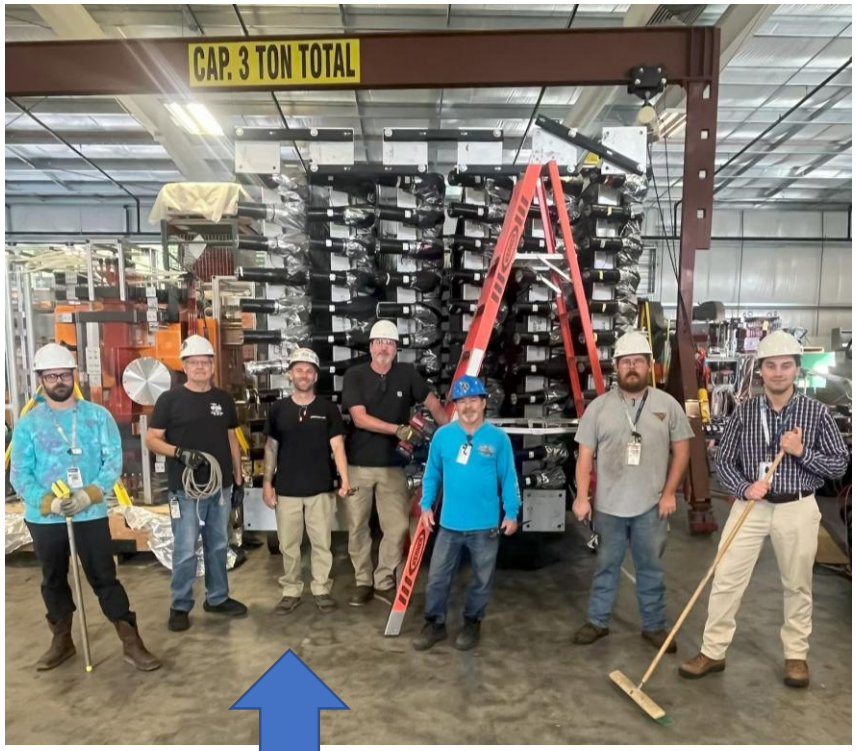
- Deinstallation of the LAD detectors and DAQ bunker
- Rotated scattering chamber back to normal configuration
- Replacing cryo targets with 4cm and 10cm targets.
- Restored SHMS cable trays
- Certified SHMS rotation out to ~40 degrees
- Removed SHMS Noble Gas Cherenkov, install vacuum extension
- ESR work was needed so warmed up SHMS/HMS magnets. Cool-down delayed by the government shutdown. Magnets cooled back down in December. Still working on the HB magnet.
- Replacing the HMS exit window
- Working on Hall C A-Can
- Mid December started contractor work for permanent fix to the switchboard. Work was completed last week.

Busy times in Hall C

Jerry Nines talking on two phones at once.

Large Angle Detector (LAD) disassembly in Hall C





Taken from Hall C to the ESB and installed in the storage rack.

Sad news with the passing of Robert Wilkinson

Rob will be missed by everyone in Halls A & C

Hall C machinist and technician

Worked at JLab since 2018

Rob with Jerry, Paulo and Lars before bringing the NPS calorimeter to the hall.

Rob with Jerry Nines and Larry Carraway

Recent retirements in Hall C

Joe Beaufait, 34 years, Jan 2026

Bert Metzger, 25 years, Dec 2025

Dean Spiers, 5 years, Oct 2025

Bert and Joe with everyone during the first HKS installation

Bert in Hall C at one of the spectrometer bogies.

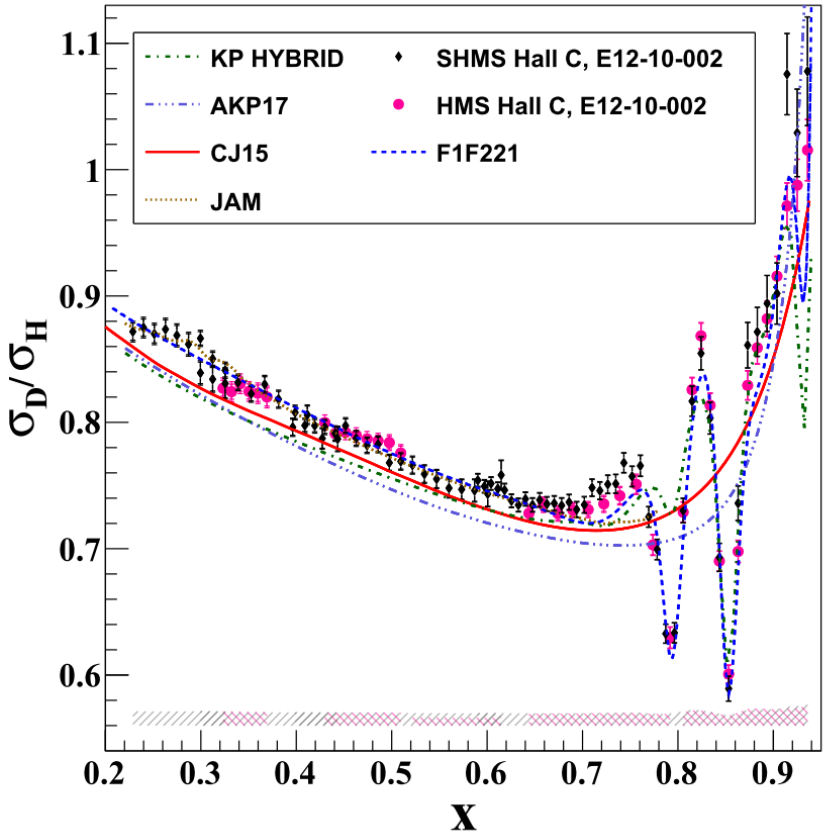
Dean, Rob, Steve, Jerry, Paulo, Bert and Larry during the NPS installation

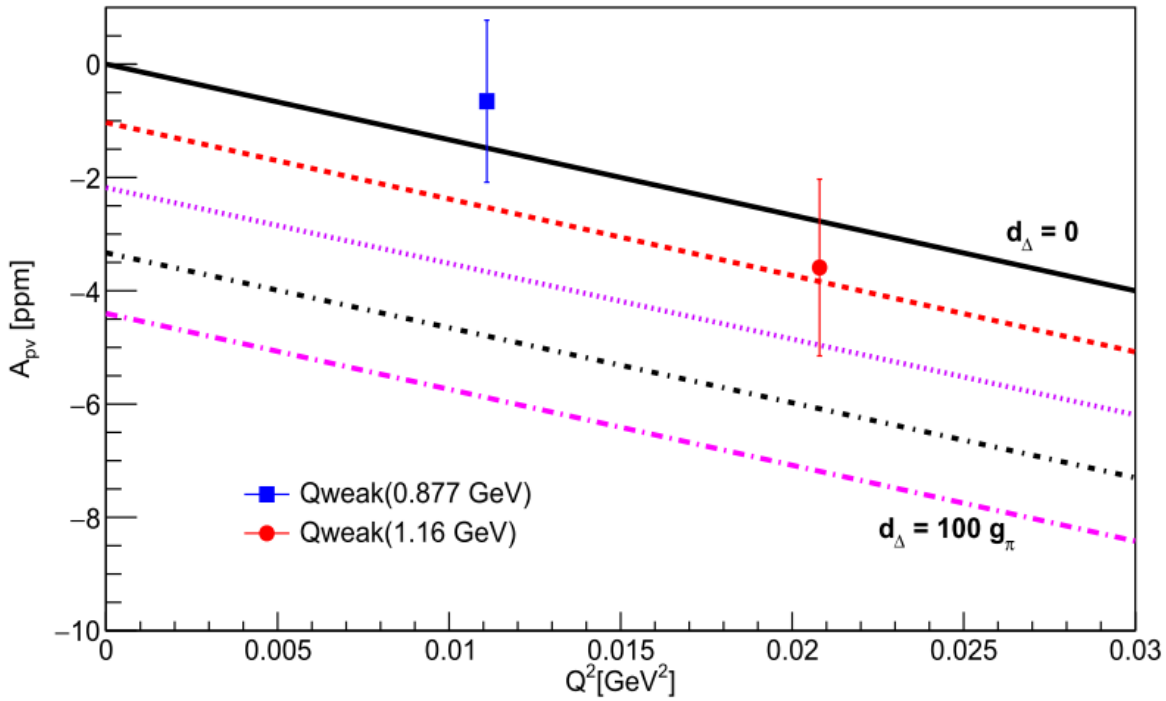
Hall C staffing

- Hall C technicians: Jerry Nines (work coordinator) , Larry Carraway (deputy work coordinator), Michael Bowman and Philip Ulhmann
  - Short one tech
- Hall C Engineering and Design: Jamie Shiflett (Lead engineer) , Jason Clark (engineer), Paulo Medeiros (senior designer) , Mark Garrett (new designer)
  - Short on designers. Looking for help from Hall A E&D.
- Hall A&C Spectrometer Support Group : Ellen Becker (group leader), Heidi Fansler, Lars Gustavson, Ibrahim Albayrak (GEM support).
  - Samantha Hahn decided to leave Jlab in January 2026.
  - Extremely short handed with Sam and Joe leaving.
  - Looking for help from other groups at JLab.
- Hall A&C Postdocs
  - Ching Him Leung, Deb Biswas, Zeke Wertz and Allison Zec.
- Hall A&C Scientific Staff
  - Replacement position for Bob Michael's was put on hold.
  - With JLab ISP, we had the sad news that Dave Mack was laid off.

Publications since last meeting

- Parity-Violating Asymmetry in the N → Δ Transition at Low Q → *PRC 112 (2025), L012501*
- σ_D/σ_p at large x and Q^2 (E12-10-002) → *PRL* 135 (2025) 15, 151902
- SHMS NIM article → *NIM A* 1083 (2026) 171070
- Beam Spin Asymmetry in Deep Exclusive π^+ Production (Kaon-LT experiment, E12-09-011)



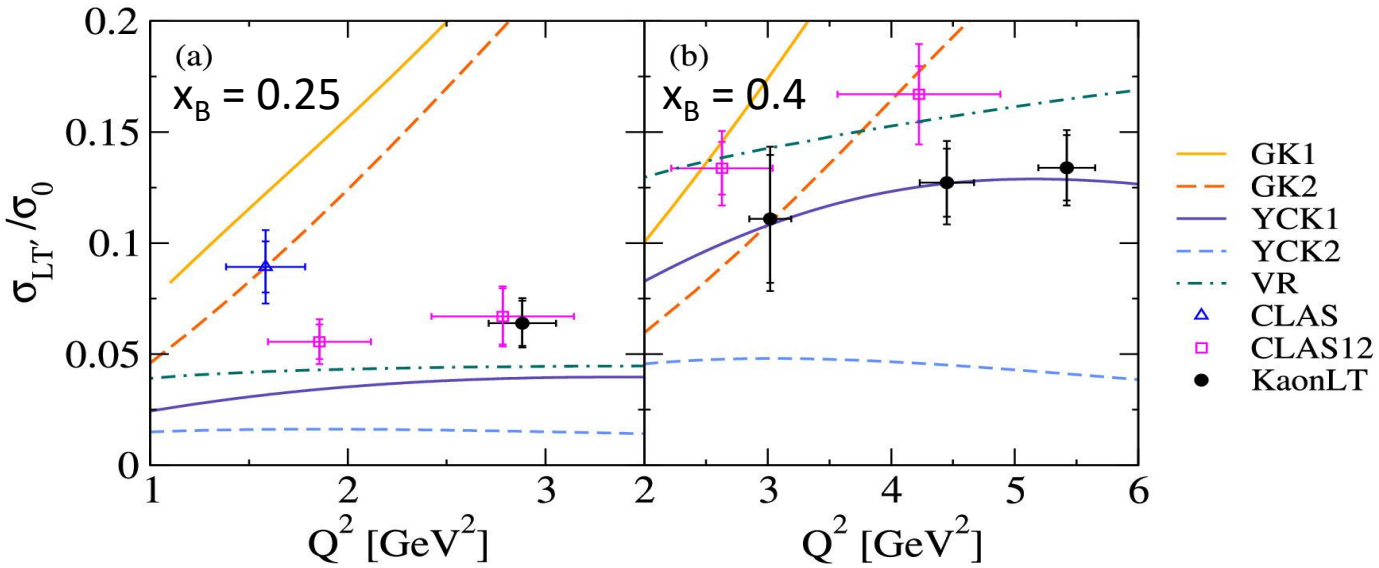


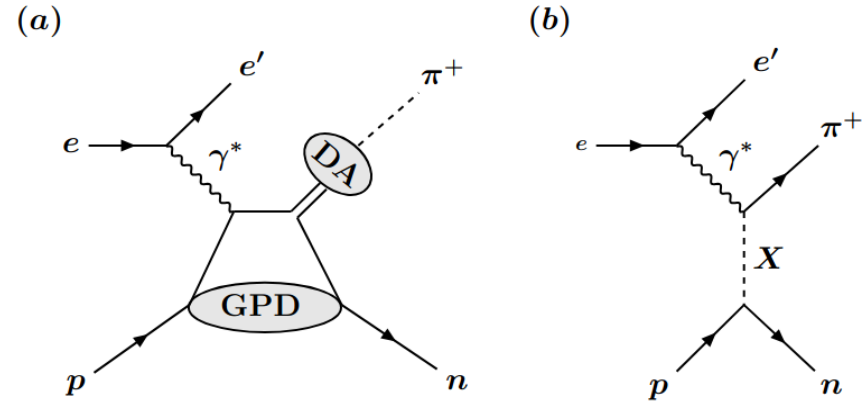
Jefferson Lab

KaonLT Beam-Spin Asymmetry of p(e,e'π⁺)n

- Comparing data with **GPD** (a) and **Regge** (b) models
- **Regge** (YCK1,YCK2,VR), **GPD** (GK1,GK2)
- Our data show better agreement with Regge models
- Implies **hard/soft factorization** is not valid for $Q^2 \leq 5.5$ GeV^2 in p(e,e'π⁺)n
- **Improvement on previous CLAS12 results:** new model, finer kinematic binning
- First measurement of **Q^2 dependence** of $\sigma_{LT'}/\sigma_0$ at fixed (x_B,t): mostly flat

Lead author **Alicia Postuma**, grad student at U of Regina





First publication from KaonLT experiment!

ELSEVIER

Physics Letters B
Volume 872, January 2026, 140094

Letter

Probing hard/soft factorization via beam-spin asymmetry in exclusive pion electroproduction from the proton

A.C. Postuma [a], G.M. Huber [a], D.J. Gaskell [b], N. Heinrich [a], T. Horn [c b], M. Junaid [a], S.J.D. Kay [a d], V. Kumar [a], P. Markowitz [e], J. Roche [f], R. Trotta [c], A. Usman [a], B.-G Yu [g], T.K. Choi [h], K.-J Kong [g], S. Ali [c], R. Ambrose [a], D. Androic [i], W. Armstrong [j k], A. Bandari [l], V. Berdnikov [c], H. Bhatt [m], D. Bhetuwal [m], D. Biswas [n], M. Boer [j], P. Bosted [l], E. Brash [o], A. Camsonne [b], J.-P. Chen [b], J. Chen [l], M. Chen [p], M.E. Christy [n], S. Covrig [b], M.M. Dalton [b], W. Deconinck [q], M. Diefenthaler [b], B. Duran [j], D. Dutta [m], M. Elaasar [r], R. Ent [b], H. Fenker [b], E. Fuchey [s], D. Hamilton [t], J.-O Hansen [b], F. Hauenstein [u], S. Jia [j], M.K. Jones [b], S. Joosten [k], M.L. Kabir [m], A. Karki [m], C. Keppel [b], E. Kinney [v], N. Lashley-Colthirst [n], W.B. Li [l w], D. Mack [b], S. Malace [b], M. McCaughan [b], Z.E. Meziani [k j], R. Michaels [b], R. Montgomery [t], M. Muhoza [c], C. Muñoz Camacho [x], G. Niculescu [y], I. Niculescu [y], Z. Papandreou [a], S. Park [w], E. Pooser [b], M. Rehfuss [j], B. Sawatzky [b], G.R. Smith [b], H. Szumila-Vance [b], A. Teymurazyan [a], H. Voskanyan [z], B. Wojtsekhowski [b], S.A. Wood [b], Z. Ye [k], C. Yero [e], J. Zhang [p], X. Zheng [p]

Near future Hall C schedule

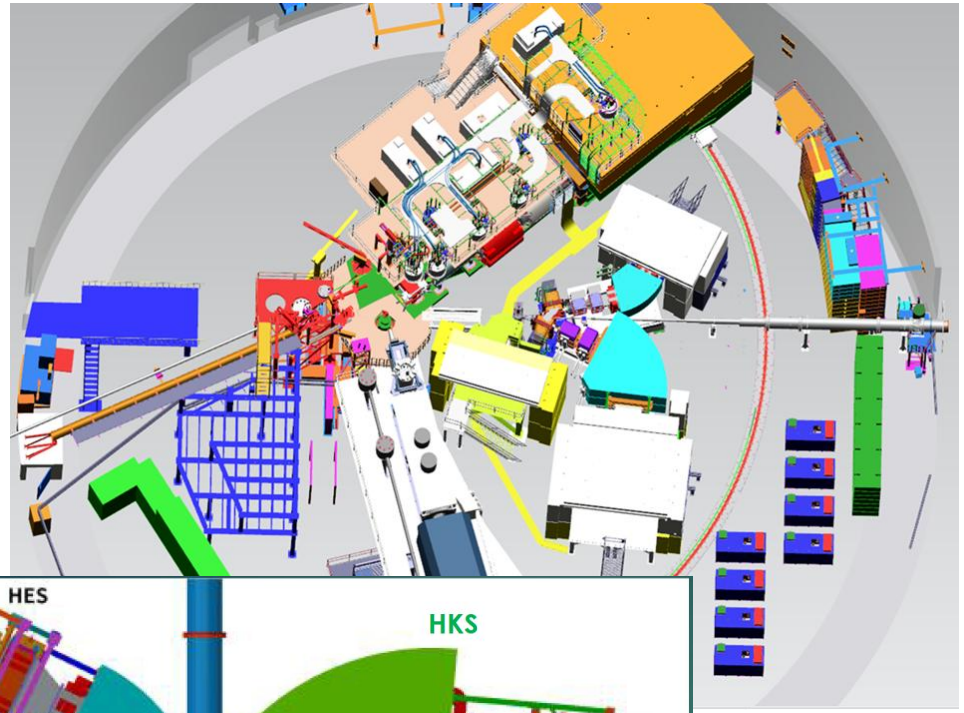
- Still planning for the 2027 run period with MOLLER. **No fixed schedule**
  - Unknown when it would start but guess at Feb 2027.
- Tentative plans for 11 weeks of running for high power cryo targets in Hall C
  - Complete part of the VCS experiment.
  - Run the NucR experiment, E12-14-002: ”Precision Measurements and Studies of a Possible Nuclear Dependence of R”
    - Need to have time at a non-standard linac energy setting
    - Add in completion of KaonLT? (complete the x=0.25 scaling scan)
- Then stop beam to Hall C and start installation of Hypernuclear.
  - Roughly 10 month installation
  - Guesstimate to start hypernuclear in Spring 2028.

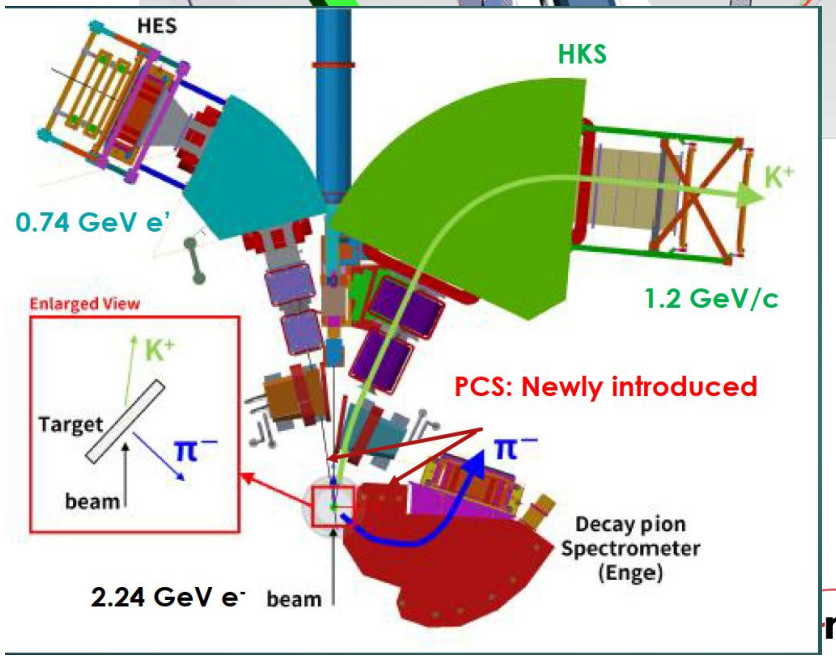
Hypernuclear experiments

- Experiments had ERR in Nov 2024.
- Much work is needed to pass the ERR in May 2026. See report
- Experiment PAC days. Total 149 PAC days. Assuming 50% efficiency that is 42 weeks. Two run periods.

Experiment	Title	PAC Days
E12-23-013	An isospin dependence study of the Lambda-N interaction through the high precision spectroscopy of Lambda hypernuclei	55
E12-24-011	Study of a triaxially deformed nucleus using a Lambda particle as a probe	28
E12-24-003	Studying Lambda interactions in nuclear matter with the ^{208}Pb(e,e' K+)$^{208}{}_{\Lambda}$Tl reaction	42
E12-24-004	Study of charge symmetry breaking in p-shell hypernuclei	24
Run Group	High-resolution spectroscopy of light hypernuclei with the decay-pion spectroscopy (ENGE magnet)	N/A

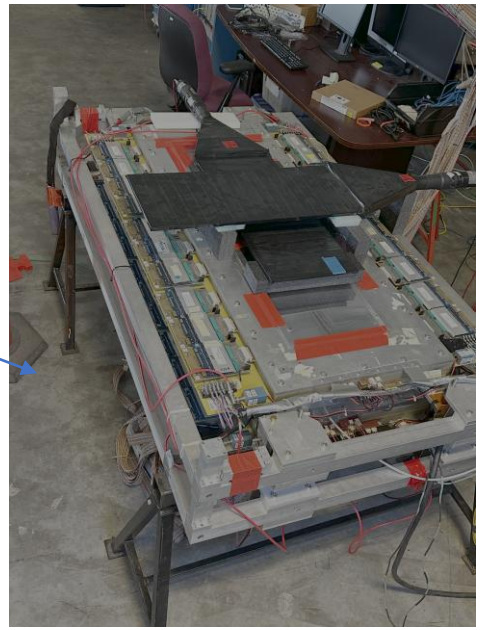
- MOLLER will be running in Hall A during the time that Hypernuclear experiments would run

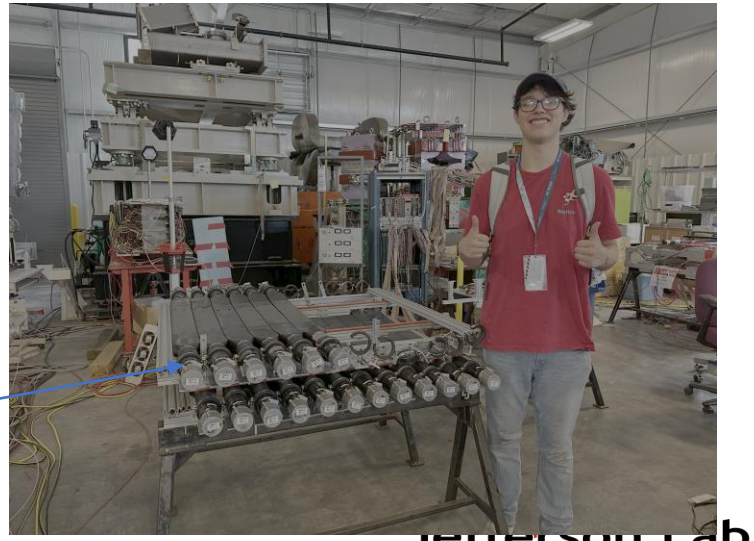




Ongoing work on Hypernuclear Detectors in ESB

Drift chamber cosmic tests





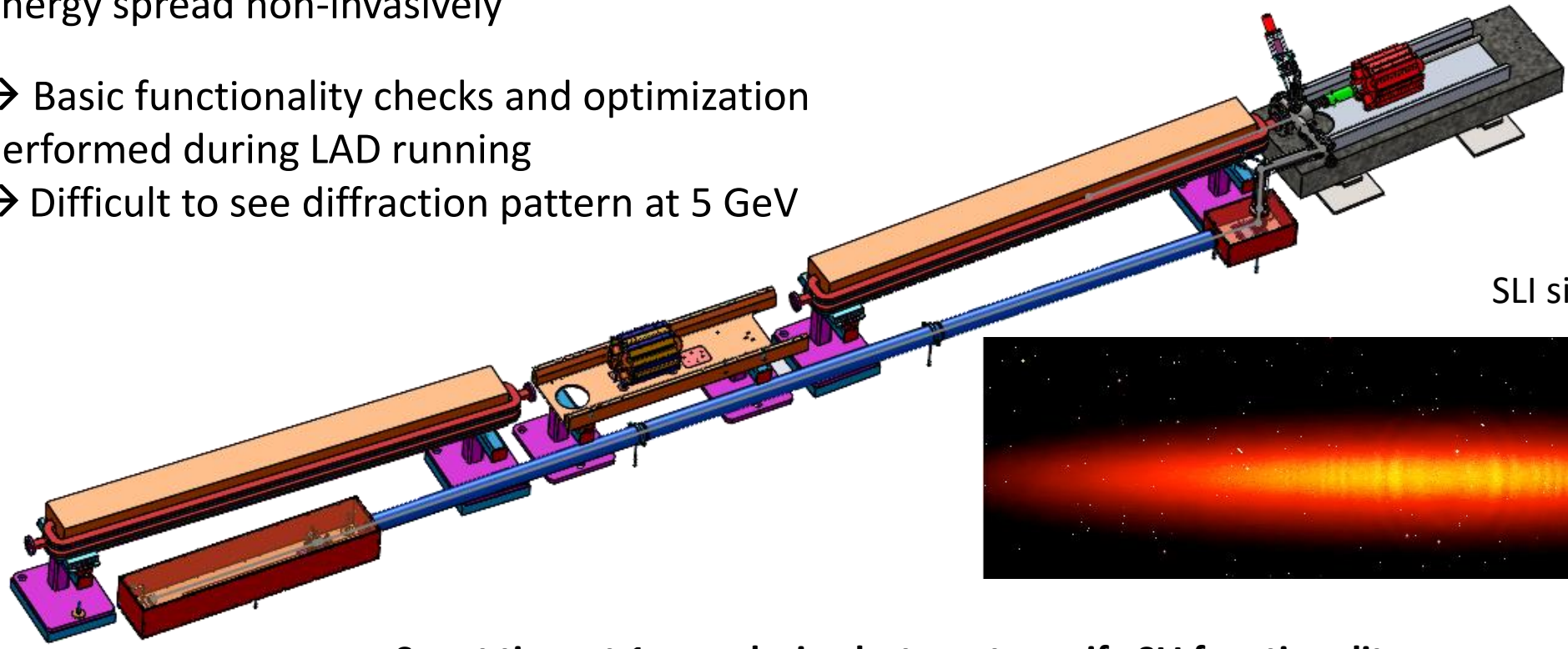
Matthew Greene (VT summer student)
→ Re-purposed Gen-RP hodoscope for ENGE TOF detector

SLI Test for Hypernuclear Experiments

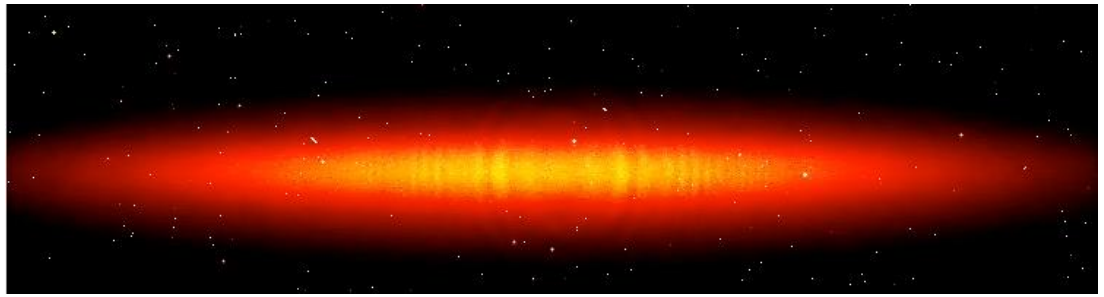
Significant concern expressed at first ERR that 12 GeV CEBAF would not be able to provide required energy spread ($\Delta E <= 3 \times 10^{-5}$ (70 keV at 2.24 GeV)

New Hall C Synchrotron Light Interferometer installed during previous SAM, needed to monitor energy spread non-invasively

→ Basic functionality checks and optimization performed during LAD running
→ Difficult to see diffraction pattern at 5 GeV



SLI signal at 5 pass



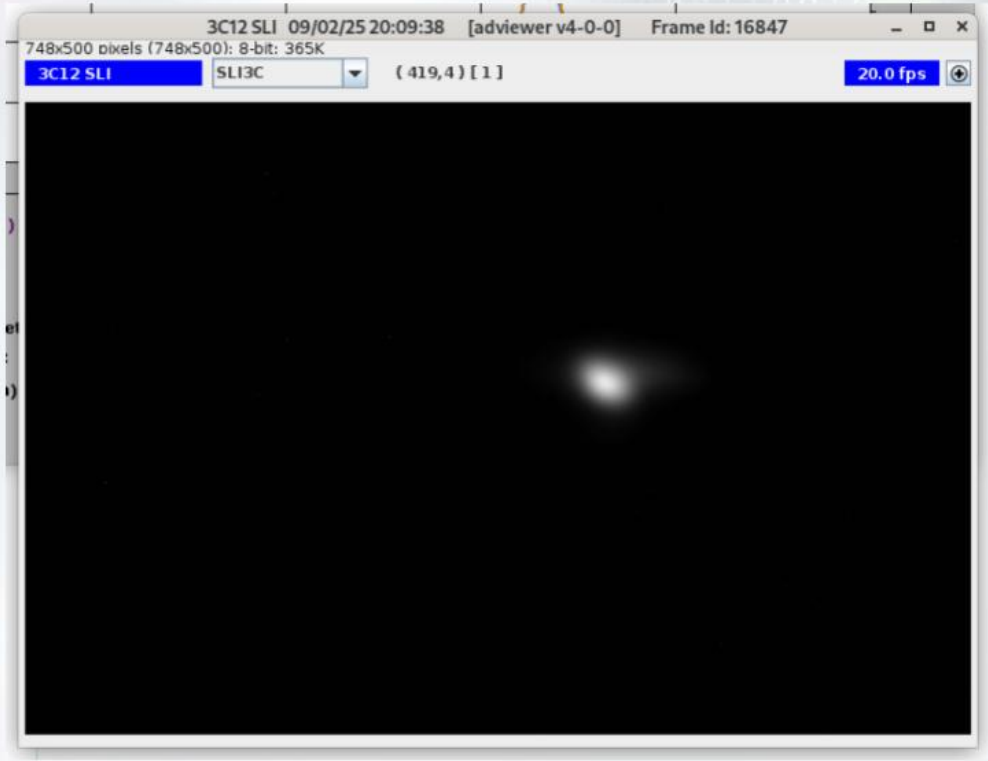
Spent time at 1 pass during last run to verify SLI functionality, measure energy spread

Joe Gubeli

Results from SLI in first test

Results Highlights:

- Took harp scans to measure emittance and twiss functions at IHA3C05
- Removed the slits in the SLI to get essentially a “pinhole” image of the beam (no interference fringes)
- Used camera calibration and a gaussian fit to the profile to get beam size
- From harp horizontal beam size σ_x = 162 μm
- Using measured emittance and dispersion this is $\delta E/E \sim 3.2 \times 10^{-5}$
- SLI gaussian fit is approximately the same size ~ 200 μm
- Noted drift in beam size overnight corresponding to ~ $\delta E/E \sim 4.5 \times 10^{-5}$ (logbook entry 4456074)



Logbook entry 4455517

Schedule beyond Hypernuclear

- MOLLER running in Hall A (65uA at 5 pass) until 2030. Limits current and target power to Hall C.
- Likely candidates to run after hypernuclear experiments are experiments using polarized ammonia targets
  - E12-13-011 The Deuteron Tensor Structure Function b1
  - E12-15-005 Measurements of the Quasi-Elastic and Elastic Deuteron Tensor Asymmetries
  - E12-24-002 Exploring the Transition Region of QCD with the Proton's g2 Spin Structure Function
- Have an exciting list of approved experiments
  - Standard HMS/SHMS :
    - E12-20-007 Backward-angle Exclusive pi0 Production above the Resonance Region
    - E12-23-010 Color Transparency in Maximal Rescattering Kinematics
    - E12-25-007 Studying the Strangeness D-Term in Hall C via Exclusive Phi Electroproduction
    - E12-24-007 Nuclear Dependence of Beam Normal Single Spin Asymmetry in Elastic Scattering from Nuclei
      - Needs new detectors in the SHMS.
  - Experiments using the NPS: Complete Hall A DVCS, Wide Angle Compton and Exclusive photoproduction
  - Polarization observables in WACS using the Compton Photon Source, polarized NH3 target, NPS and BigBite
  - The experiment: "A Search for a Nonzero Strange Form Factor of the Proton at 2.5 (GeV/c)^2"
  - Experiments using the SBS/BB
    - SIDIS on polarized 3He target
    - Tagged DIS to measure the pion/kaon structure functions

Conclusion

- Challenging times with budget and staffing.
  - Lab wants to increase reserve to 6 weeks.
  - Reduced staffing to support experiments.
  - Reduced beam run time.
- Physics beam scheduled for starting on March 18th.
  - E12-22-001: N-Δ at low Q^2 & E12-23-001: VCS at low Q^2
- Switch to standard beam energies between May 11 to May 25 . End of August 17.
  - E12-06-104/E12-24-001: R-SIDIS (Part 2)
  - E12-06-107: Color Transparency via exclusive pion electroproduction
- Hypernuclear experiments
  - Preparation of detectors in ESB. SLI installed and tested.
  - Collaboration meeting on Feb 12-13 at Jlab.
  - Needs to pass ERR on May 20-21.
- Run schedule in 2027 is not finalized
  - Idea that Hall C would run high power HMS/SHMS experiments in first 11 weeks and then start the hypernuclear experiments installation.