Hall A/C Status

July 2023 SBS Collaboration Meeting

Safety pause at Jefferson Lab

- Had two recent incidents with LOTO at JLab (all hands meeting)
  - Pause on work involving LOTOs until it is reauthorized.
  - 67 OSPs with LOTOs have been reviewed.
- With tragic events at SLAC and Fermilab
  - DOE directive that off hours high hazard work needed full support as during normal working hours. (High hazard is unmitigated risk code >=3 or class 2,3 electrical)
    - Could not work in the tunnels or halls since ODH hazard. Now have a variance.
    - Need approval of COO and DOE site office.
    - Could affect the efficiency of running since a variance needs to be obtained in advance for each high hazard OSP.
- Incident with hazardous energy at JLab that is similar to SLAC
  - JLab safety pause to review all OSP with high hazard work (video of meeting)
    - Division Safety Officer needs to review and approve the reauthorization.
    - Many OSPs. Takes time to review OSP, complete paperwork and have it approved.

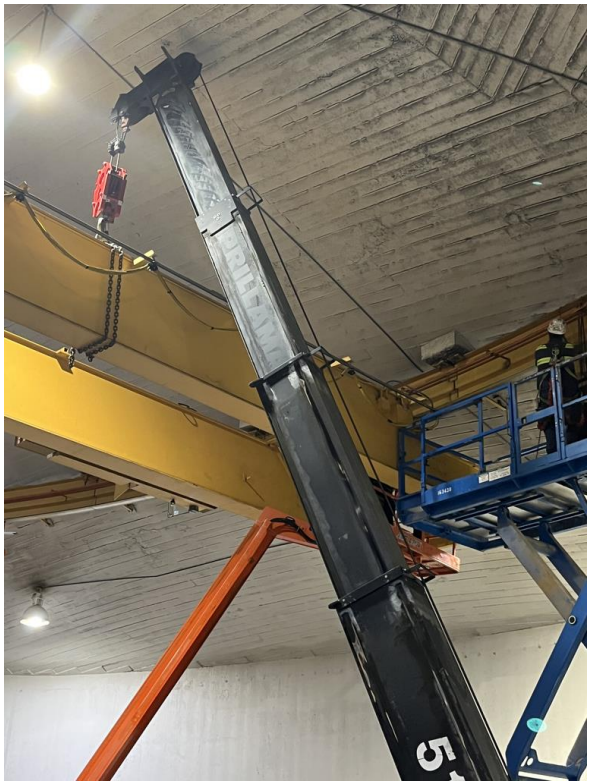
Upcoming beam schedule

- Safety pause makes predictions of beam start date murky.
- At July 12th MCC meeting:
  - 2K cooldown to start July 24th
  - Showed proposed schedule that the start of physics in Hall B and C was Sept 1st.
  - Would start the Hall A physics about 2 weeks later.
  - Most optimistic schedule.

- The beam schedule will be shifted overall, so end of beam sometime in May 2024
- Most likely this will cause shift back to SAD during the summer months
- Hall A crane repair is ongoing. Discuss on the next slide.
- Shifts the GEn-RP and K_LL running to March 2024.
- Need about 6 months installation for GEp, so start GEp in Oct 2024.

Hall A Crane repair

- Started on May 29th . Replacement of the trucks is complete.
- Working on supports is ongoing. To be done week of July 23rd.
- Then load test and inspection in first week of Aug.



New trucks installed

Changes to the Hall A/C staff

New Staff hires

- *Ciprian Gal* started Jan 16th.
- *Bill Henry* started March 16th.
- *Sanghwa Park* started June 1st.
- *Chandan Ghosh* started July 3rd.
- *Hanjie Liu* will start Sept 1st.

Staff that has left

- Roger Carlini retired in Dec 2022.
- Greg Smith retired in April 2023.
- Jessie Butler left on June 23, 2023 for job with Dominion Energy
- Jack Segal left on June 28, 2023 for job at the European Spallation Source in Lund, Sweden.

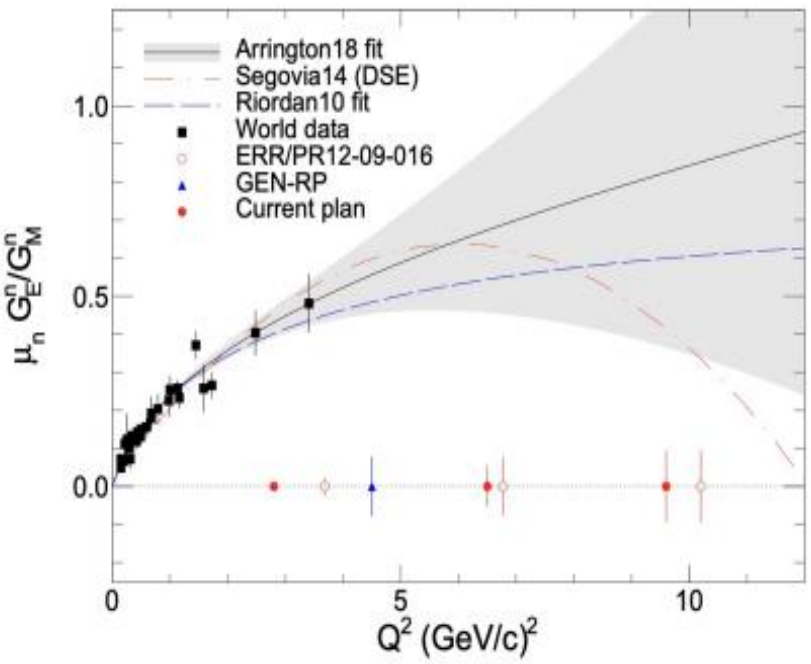
Changes in staff roles

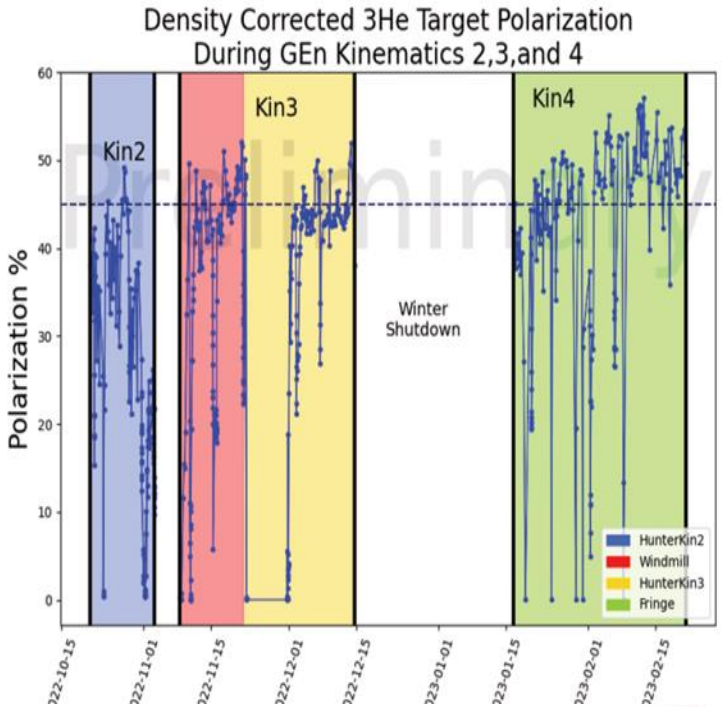
- Zachary Remele is the acting Hall A work coordinator
- Andrew Lumanog is the acting Hall A deputy work coordinator
- Dave Gaskell is the supervisor for the Spectrometer Support Group.
    - Having Engineering DC power provide on-call support for power supplies.

Hall A Electric neutron form factor

- GEn experiment started in Oct 2022
- Measure beam-target asymmetry in quasi-free polarized neutron.
- First time running with 60cm long 3He cell
- 50-55% polarization in beam!
- Completed Q^2= 2.9 and 6.6 GeV^2
- Q^2 = 9.9 GeV^2 is partially done. Complete in next run period.
- Also run the A_LL experiment:

  “Double Spin Asymmetry in Wide-Angle Charged Pion Photoproduction”





Jefferson Lab
Thomas Jefferson National Accelerator Facility

GEn-RP experiment to run in Spring 2024

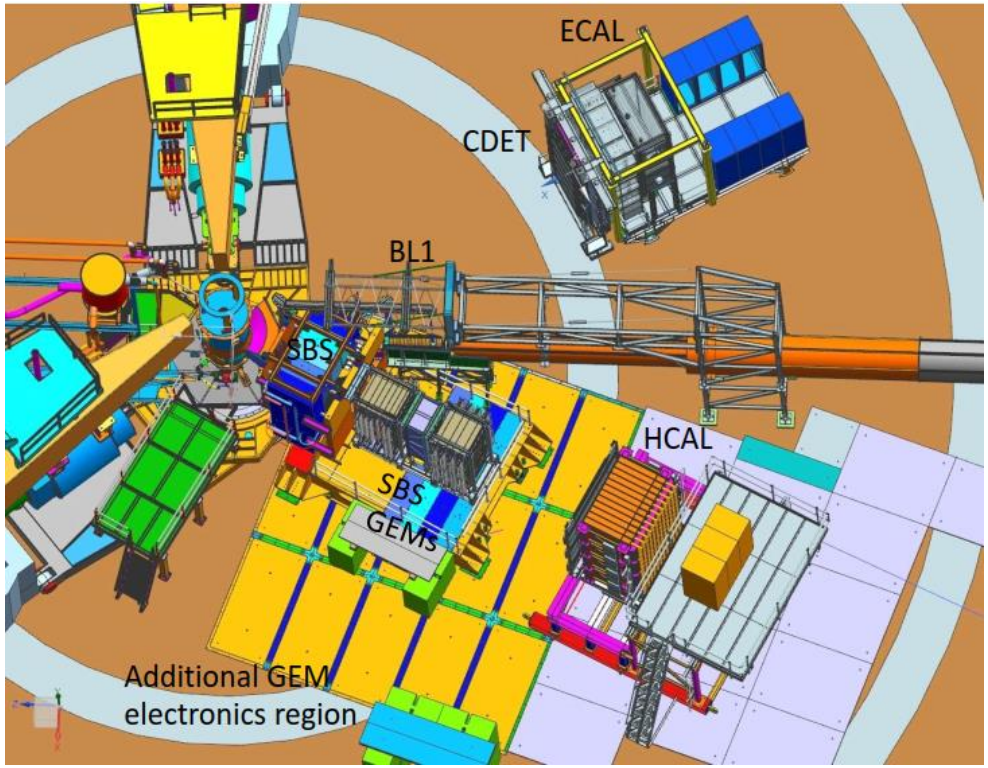
- Plan to measure at Q^2 = 4.5, D(e,e'n), measure neutron recoil polarization
- Need to deinstall 3He target and reinstall cryo target, side polarimeter detectors
- In addition, run K_LL experiment to measure the recoil polarization in WACS pion production $\vec{\gamma}n \rightarrow \pi^- \vec{p}$

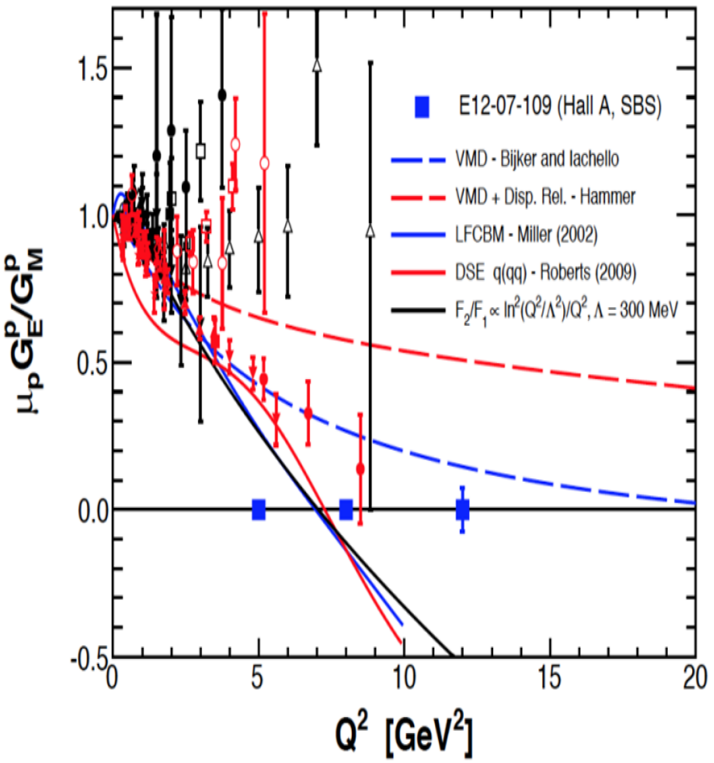
Inline SBS GEMs for GEN-RP being tested during GEn

GEN-RP setup

Proton electric form factor in Fall 2024

- Measure GEp by measuring recoil proton polarization in elastic scattering
- Need about 6 months for installation
- Experiment will run in late 2024 to spring 2025.
- Measure to $Q^2 = 12$





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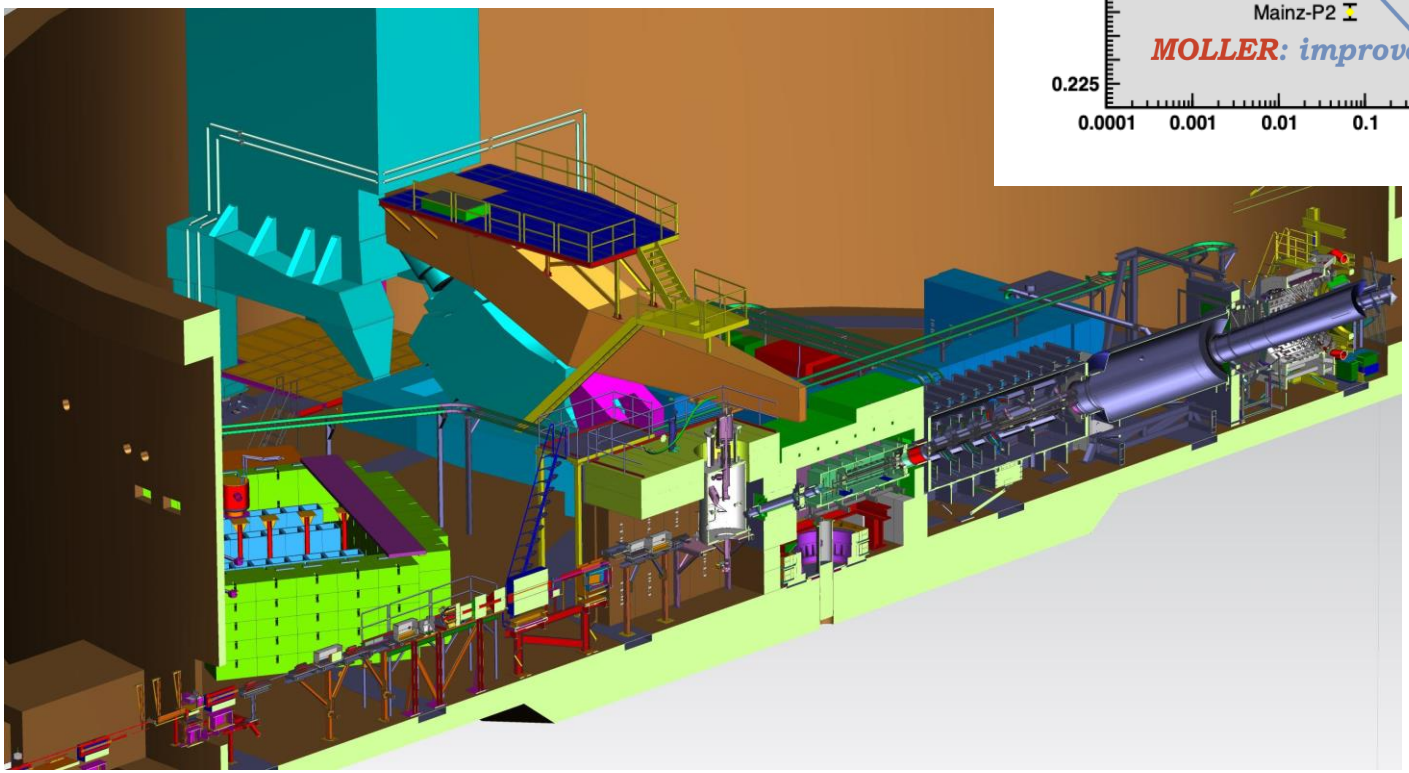
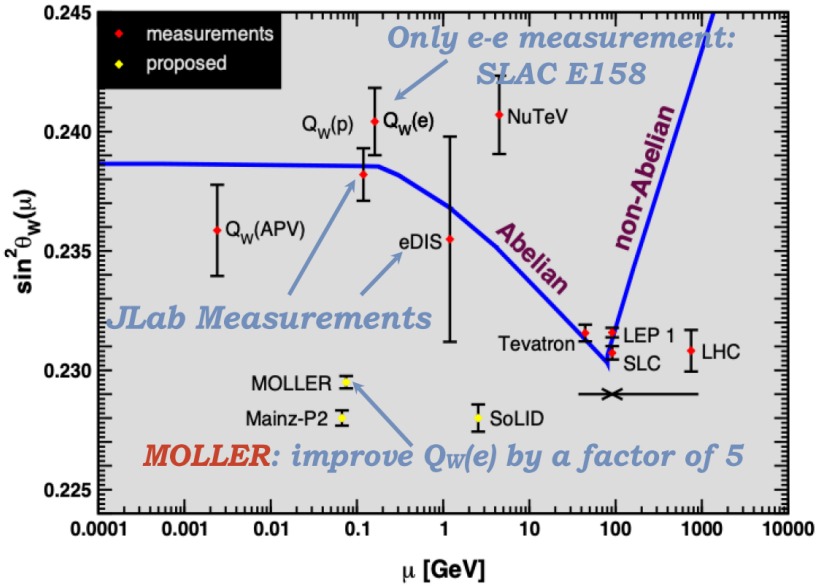
MOLLER Project

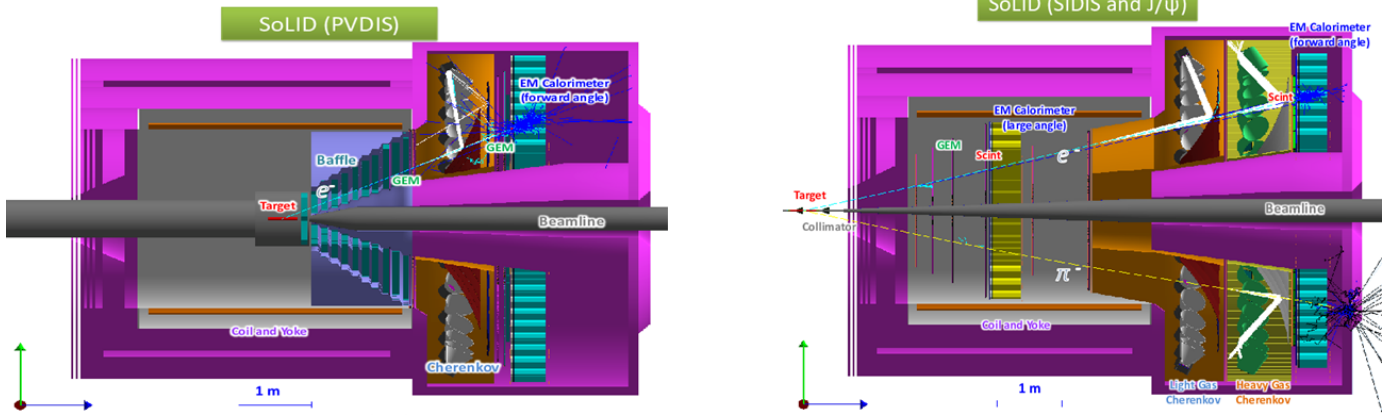
- Inflation Reduction Act provided full funding.
- Passed CD-3A review and spending CD-3A funds.
- CD2 /CD3 review in October 2023.
- Aggressive installation schedule of 18 months after GEp run ends
- 3 years of running.
- JLUO talk by Caryn Palatchi





SoLID : Solenoidal Large Intensity Device

- A series of SIDIS experiments will probe the confined motions (3-D imaging) of partons inside protons and neutrons including orbital motion, and uncover the rich QCD dynamics such as spin-orbital correlations.
- Parity Violating Deep Inelastic Scattering (PVDIS) to search for new interactions beyond the Standard Model.
- J/Ψ production near threshold will provide information on the pure gluonic component of QCD
- Completed the CLEO magnet cold test
- Successful parasitic test of high rate on detectors in Hall C
- Working to be recommendation in the Long Range Plan as it was in 2015 LRP.
- JLUO talk by Xiaochao Zheng



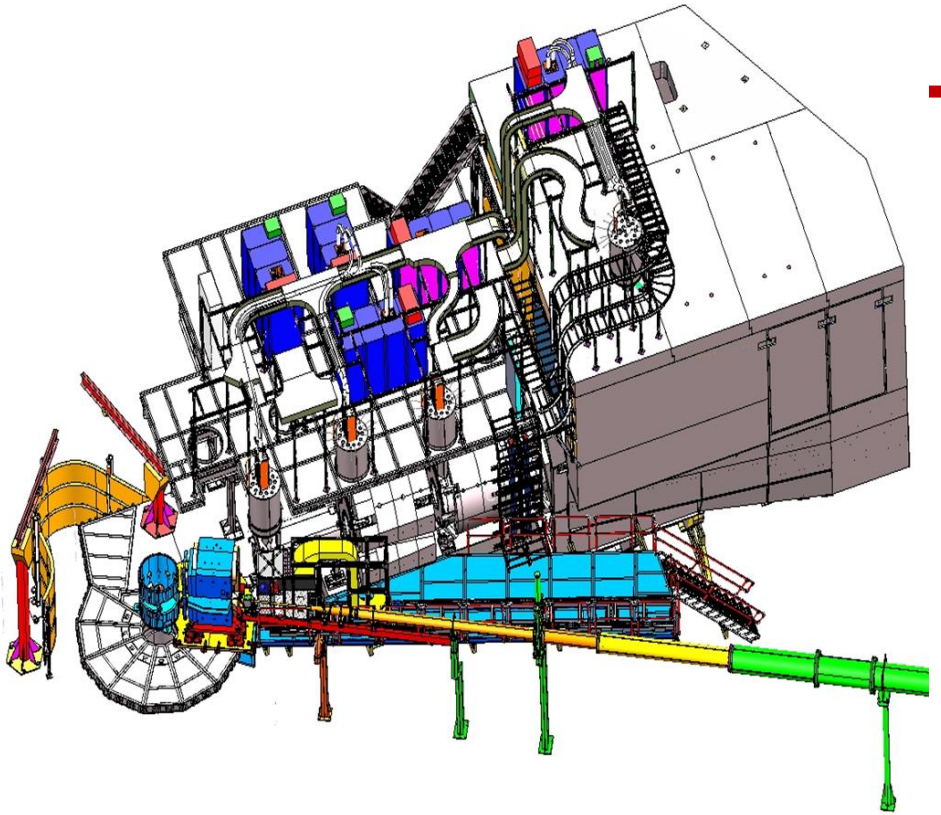
Unique Capability:

- ✓High luminosity (10^{37-39})
- ✓ Large acceptance detector with full ϕ coverage
- ✓State-of-the-Art Technology

Hall C Upcoming experiments

Neutral Particle Spectrometer

- Sweeping Magnet with calorimeter.
  - Magnet and power supply have been tested.
- NPS attached to SHMS carriage to allow easy angle change.
  - The calorimeter is on rails.
- 1080 Lead-Tungstate blocks in calorimeter to detect γ and π^0
- See JLUO talk by Tanja Horn



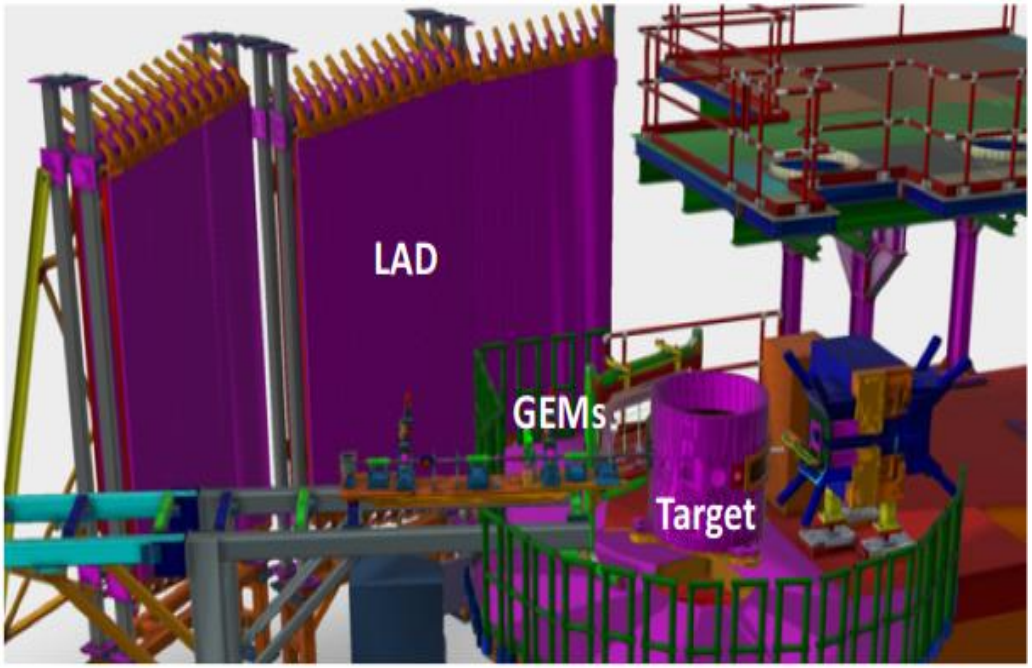
Two experiments using the NPS will run from Fall 2023 to May 2024

- E12-13-010 is two concurrent experiments
  - Exclusive Deeply Virtual Compton on proton
  - SIDIS p(e,e',π^0) cross section.
    Map the transverse momentum dependence.
- E12-22-006
  - Exclusive Deeply Virtual Compton on deuteron
  - Subtract the proton data from deuteron data to get neutron.
- Proposal PR12-23-014 would new run group that measures $R=\sigma_L/\sigma_T$ in SIDIS p(e,e',π^0) cross section.

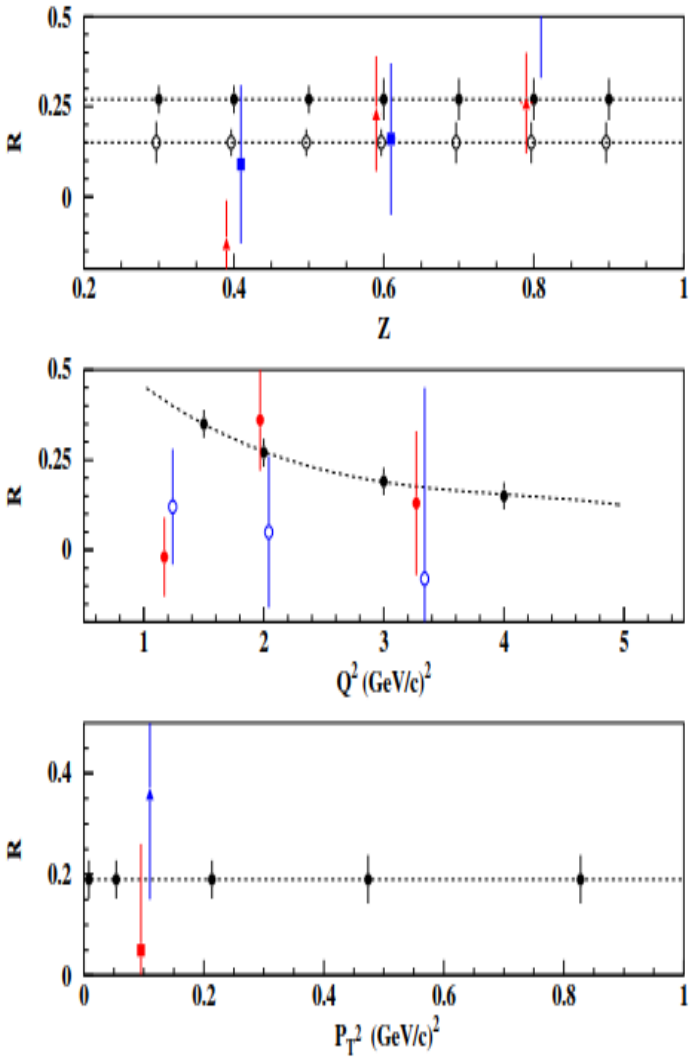
Hall C Near term future

Experiments to run in Fall 2024- Spring 2025

- Standard SHMS/HMS
  - E12-06-104 $R=\sigma_L/\sigma_T$ in SIDIS on 1H and 2H
  - E12-06-107 Complete CT experiment
  - E12-11-107 Spectator tagged DIS d(e,e'p_s)
    Install Large Angle Detector
    HMS/SHMS detect electron



$R=\sigma_L/\sigma_T$ in SIDIS



Hall C Longer term future

- Starting in Fall 2025
  - Standard SHMS/HMS experiments.
  - Experiments with non-standard beam energies
  - New proposals
- Running during MOLLER and after:
  - During MOLLER, limits on total target power and beam current in the two halls
    - Hypernuclear experiments in 2026
    - Polarized deuteron experiments
    - WACS and other experiments using the NPS
    - Experiments using the Compact Photon Source
      - Capital project is ongoing
    - SBS/BB experiments that did not run in Hall A
    - Exciting new letters of intent
- Future plans have to work with needs of the other halls and target group resources.

Summary

- We will work through this safety pause and run exciting physics experiments
- PAC (week of July 24th)
  - 16 Letters of Intent
    - 4 of 16 for positron beams
    - 3 positron and 7 electron for Hall C, 1 positron Hall A
  - 12 New Proposals
    - 6 of 12 for positron beams
    - 3 positron and 4 electron for Hall C
- Experiment schedule
  - Optimistic to start GEn and A_LL around Sept 15th
  - The beam schedule will be shifted overall, so end of beam sometime in May 2024
  - Most likely this will cause shift back to SAD during the summer months
  - Shifts the GEn-RP and K_LL running to March 2024.
  - Need about 6 months installation for GEp, so start GEp in Oct 2024.