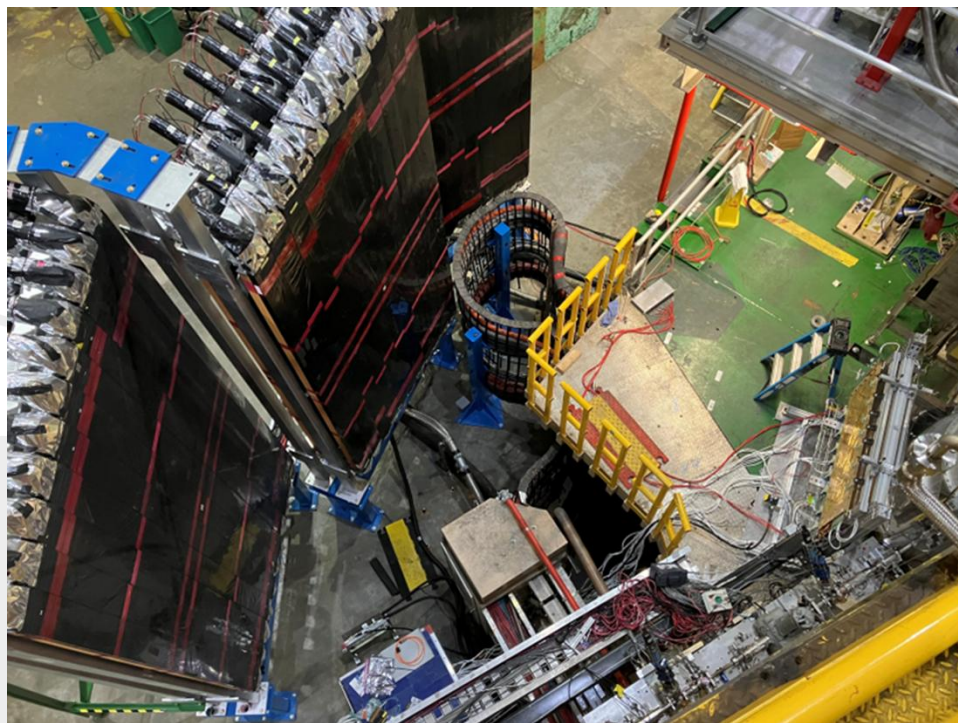


Hall C Status

Setup of the Large Angle Detector to measure the spectator proton in DIS $d(e,e'p_s)$



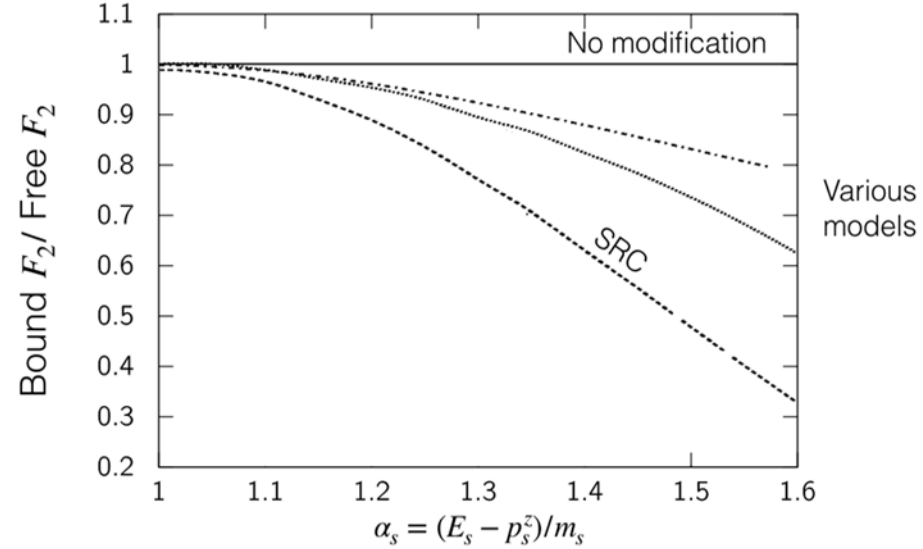
Mark Jones, October 2025
Tensor Group Collaboration Meeting

Hall C running in 2025

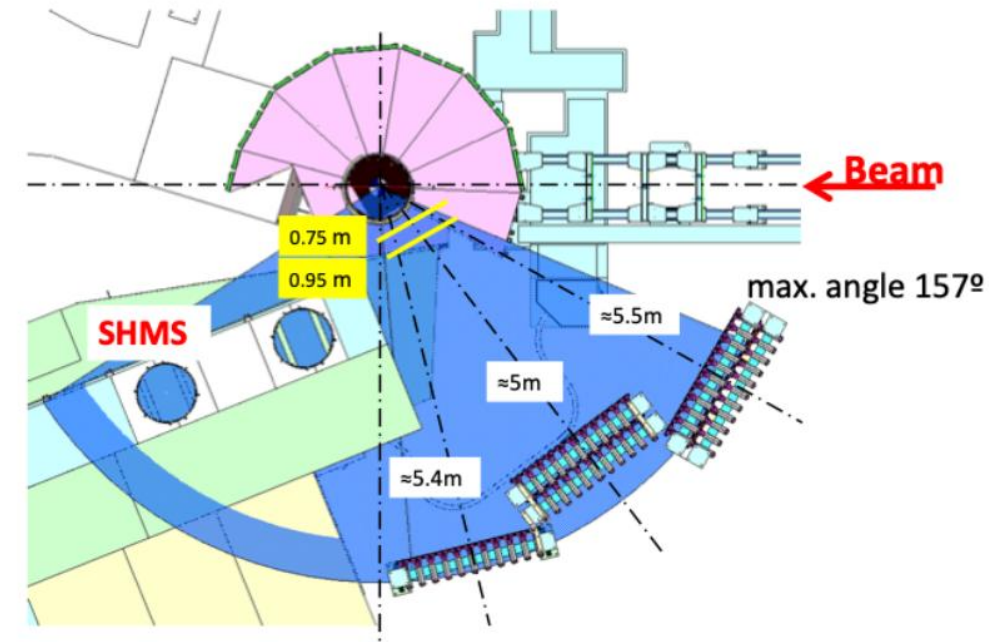
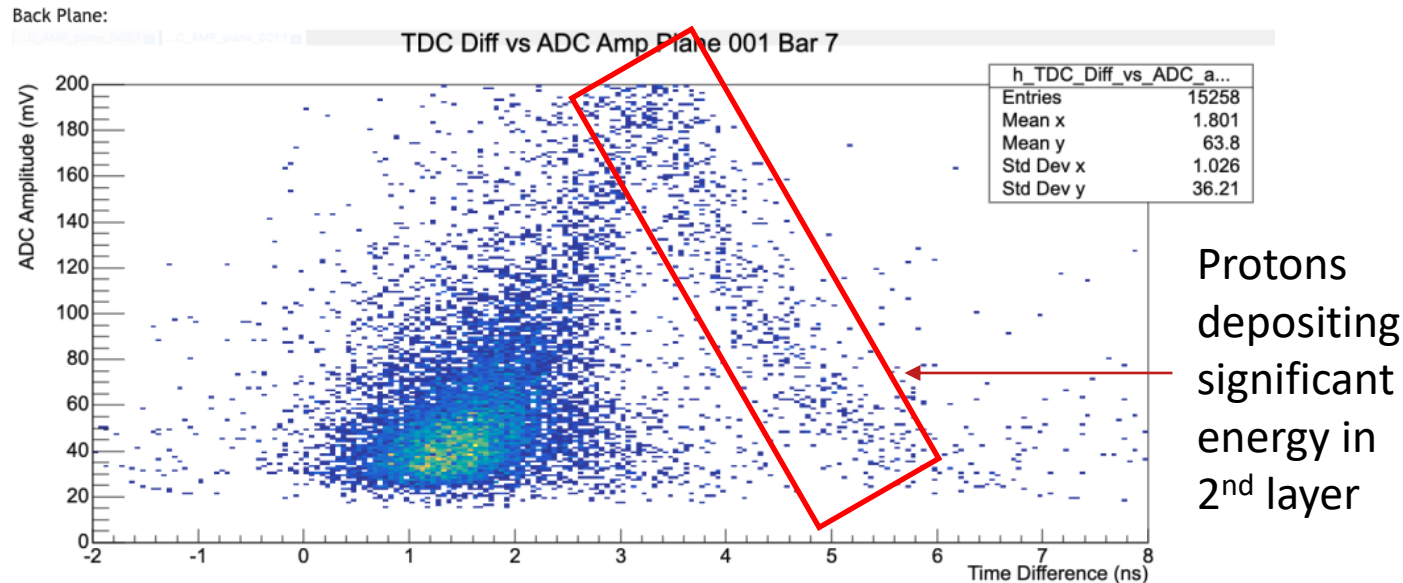
- Decision to shorten FY25 run period to 22 weeks. Had to move Pion CT to next run period.
- E12-11-107 Spectator tagged DIS $d(e,e'p_s)$ started on April 3rd 2025.
 - On April 21st , Hall C 480-volt switchboard had a short circuit. Also caused fuses in transformer upstream of switchboard to be blown.
 - 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 is 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
 - Roughly ran 30 Calendar days the FY25 run period.
 - Schedule to complete experiment in the FY26 run period

Hall C LAD (E12-11-107) experiment: Spectator tagged DIS $d(e,e'p_s)$

- Ran from April- July 14 2025
- Coincidence HMS+LAD and SHMS+LAD
- 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)

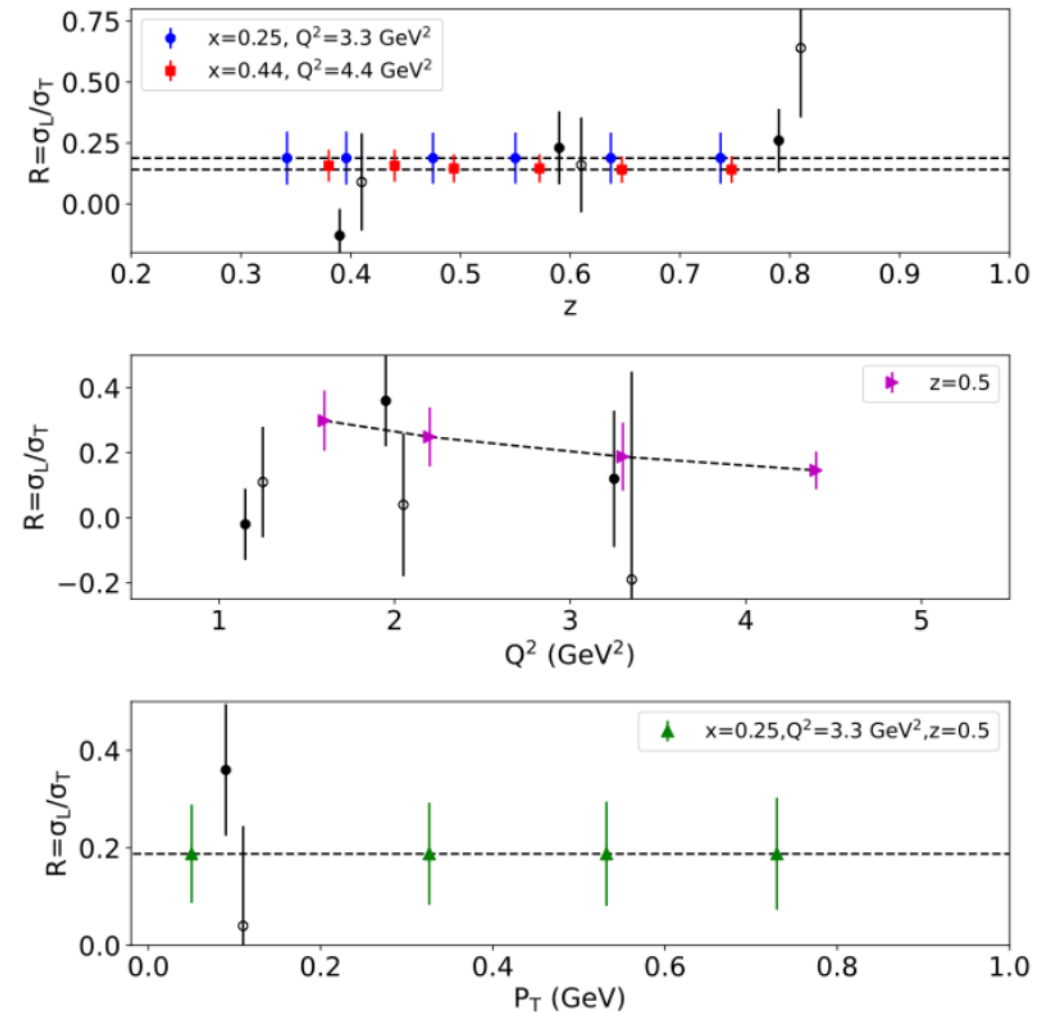


Online data from Scintillator Bars



Hall C R-SIDIS (E12-06-104, E12-24-001) completed part of experiment

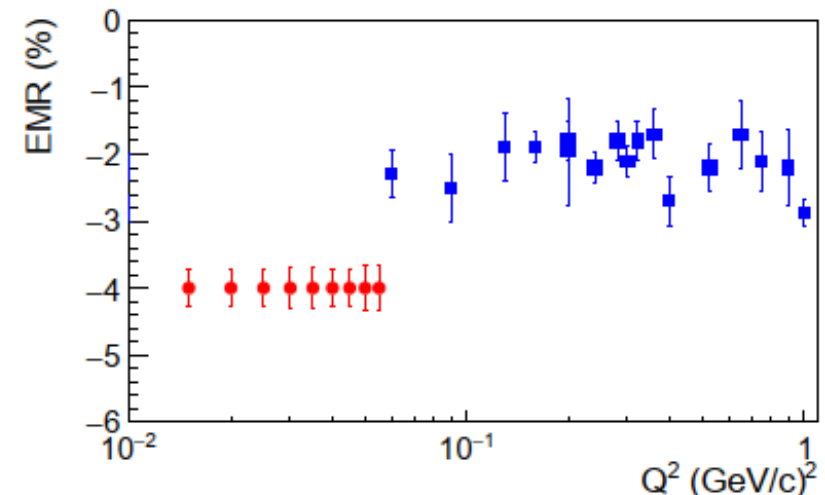
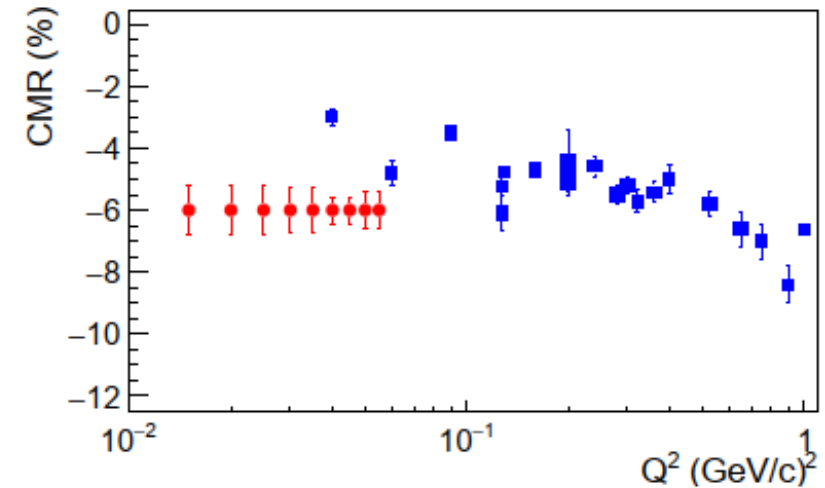
- E12-06-104 $R=\sigma_L/\sigma_T$ in π^+/π^- SIDIS on 1H and 2H
- E12-24-001 Nuclear Dependence (C,Cu) of R in SIDIS
- Part of broad program of SIDIS experiments
 - Ran two charged pion SIDIS experiments in 2018 and 2019
 - Completed π^0 SIDIS with NPS in 2023.
- During this run period completed about 40% of the experiment
- Complete remainder of experiment in FY26 run period
- Goals of experiment:
 - Map R_H SIDIS and R_D SIDIS as a function of z at same x and Q^2 setting.
 - Map R_H , R_D SIDIS as a function of z at two x and Q^2 settings
 - Map R_H SIDIS as a function of p_T at one x and Q^2 setting.
 - Map R_H SIDIS for $Q_2 = 1.6 - 4.4 \text{ GeV}^2$



Hall C Running in FY26

- Next run period in FY26
 - Special low per pass beam energy for Hall B.
 - E12-22-001 N-Delta at low Q^2 ,
 - E12-23-001 VCS at low Q^2 , (only 15 of 61 PAC days)
 - Beam goes back to standard beam energy
 - Complete E12-06-104/ E12-24-001 R-SIDIS
 - E12-06-107 Pion Color Transparency
- Run schedule in FY27 is still being determined.
 - Run standard HMS/SHMS experiments.
 - Possibilities:
 - Complete VCS experiment
 - NucR and complete KaonLT
 - Need non-standard beam energies
 - E12-23-010 Color Transparency in Maximal Rescattering Kinematics
 - E12-20-007 Backward-angle Exclusive π^0 Production above the Resonance Region
 - E12-25-007 Studying the Strangeness D-Term in Hall C via Exclusive Phi Electroproduction

Projected error bars for the E12-22-001 on the $N \rightarrow \Delta$ Transition Form Factors: $CMR = C2/M1$ and $EMR = E2/M1$.

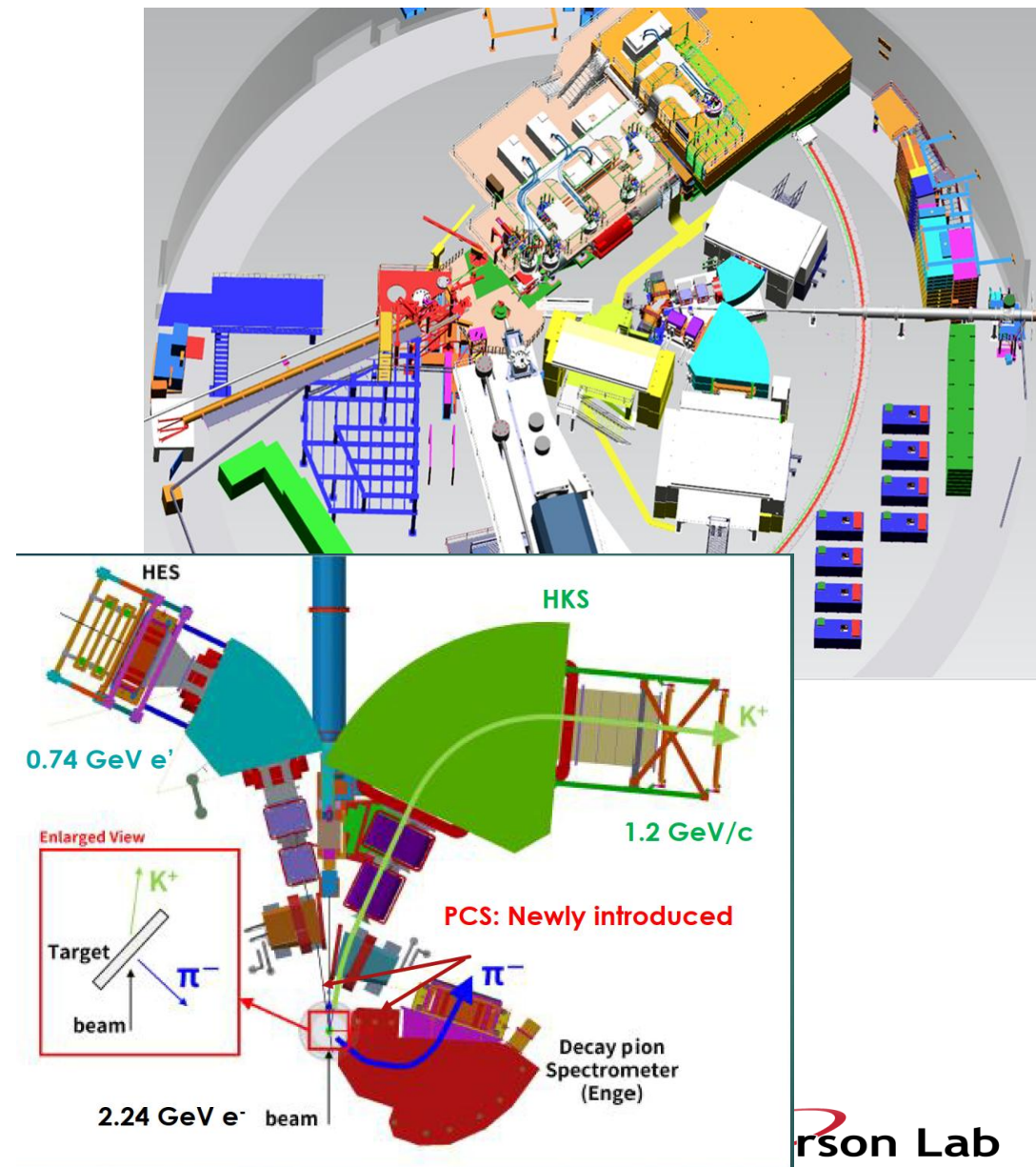


Hypernuclear experiments

- Experiments had [ERR](#) in Nov 2024. Much work is needed to pass the ERR. 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 $^{208}\text{Pb}(e,e' K^+)^{208}_{\Lambda}\text{Tl}$ 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



Hall C for Hypernuclear and Polarized target experiments

- Hypernuclear installation and running
 - Installation will take about 9 months. Start install in mid 2027 and end in early 2028.
 - Run in 2028 and 2029.
 - Start uninstall of hypernuclear and install of polarized target in mid 2029
- Polarized target running in 2030
 - Tensor deuteron polarized target, Standard HMS/SHMS, 80-100nA
 - E12-13-011, “ The Deuteron Tensor Structure Function b_1 ”, 41 PAC days
 - E12-15-005, “Measurements of the Quasi-Elastic and Elastic Deuteron Tensor Asymmetries”, 44.3 PAC days
 - Use the present beamline. Need slow raster, polarized target girder and Faraday cup.
 - Need calendar run time of 24.4 weeks.
 - Transversely polarized NH₃ target Standard HMS/SHMS, 80-100nA
 - E12-24-002,” Revealing the Transition Region of QCD with the Proton’s g_2 structure function”, 26 PAC days
 - Upgrade of the beamline.
 - Need calendar run time of 7.4 weeks