# Hall C Status

May 2025 Hypernuclear Collaboration Meeting

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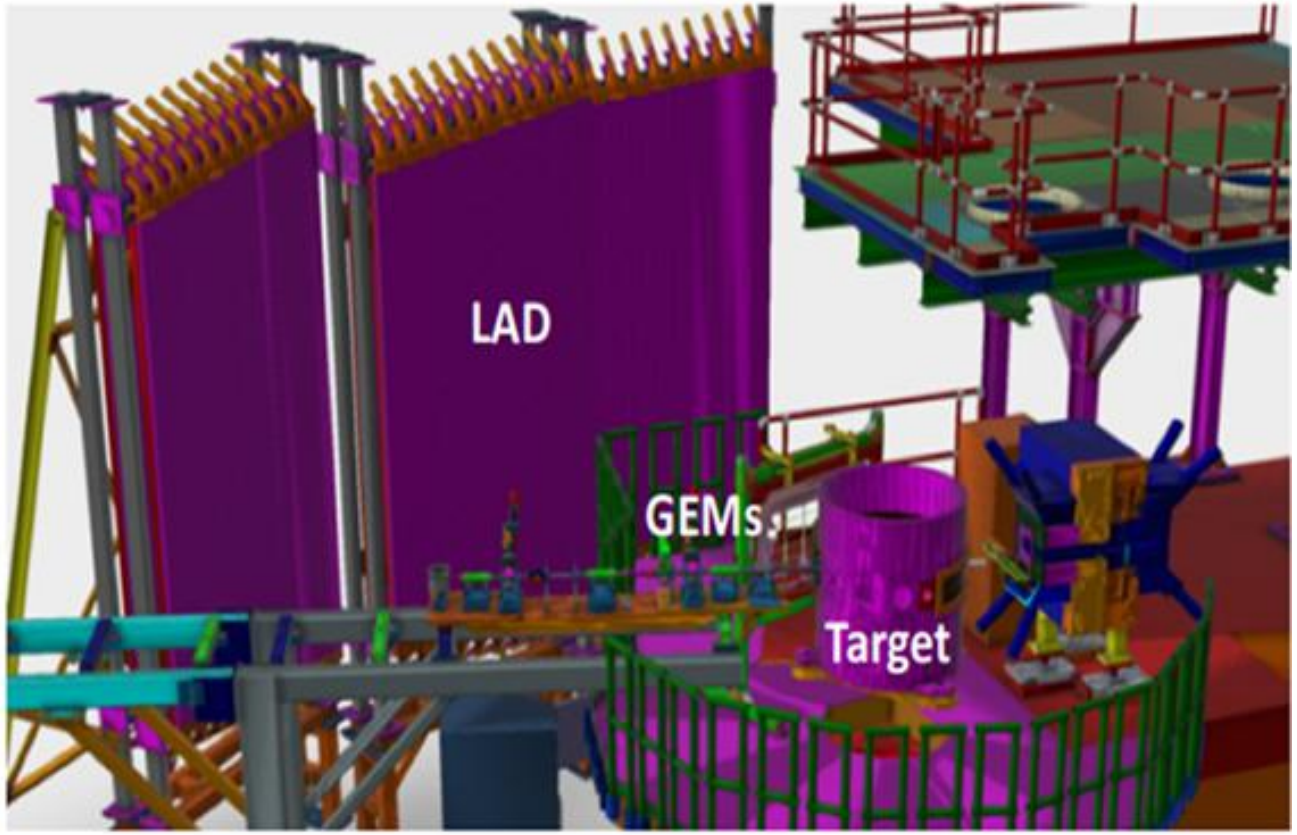
# Hall C status

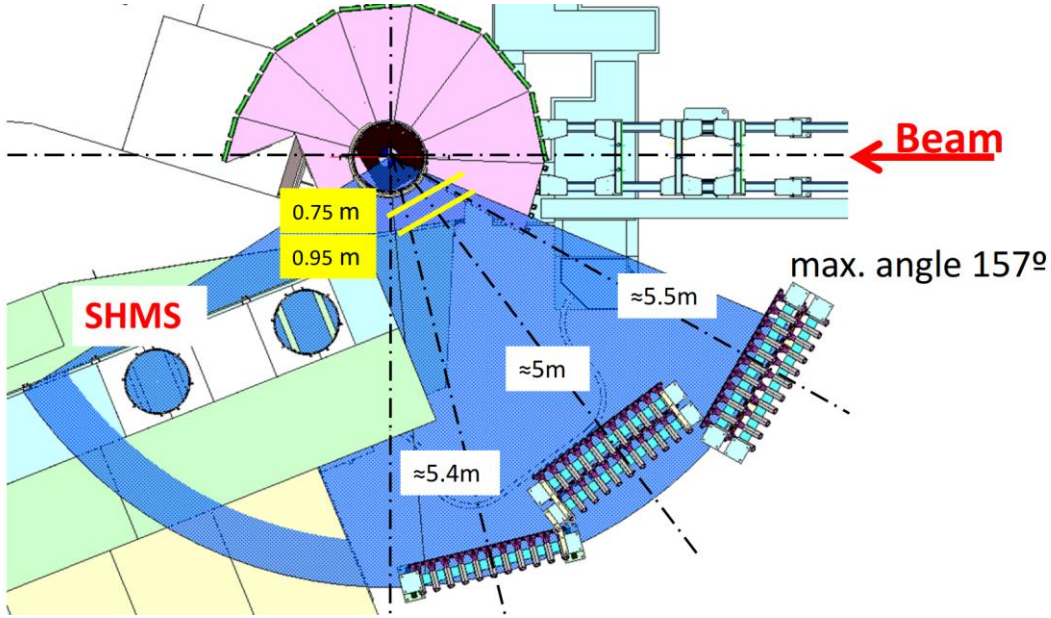
- Decision to shorten FY24 run period to 20 weeks.
- E12-11-107 Spectator tagged DIS d(e,e'$p_s$) started on April 3rd 2025.
  - On April 21st , Hall C 480-volt switchboard had a short circuit. Also caused fuses in transformer upstream of switchboard to be blown.
  - Hall C had power restored and back to beam on Friday May 9th.
  - Will shift 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 can run 30 Calendar days the FY25 run period.
  - Would run the remaining 64 Calendar days in the FY26 run period

# Hall C: Current run period

E12-11-107 Spectator tagged DIS d(e,e'$p_s$)

- Install Large Angle Detector to detect the spectator proton
- HMS/SHMS detect DIS electron
- Scattering chamber rotated so large opening to 157 deg
- 20cm LH2 target with opening for 157 deg



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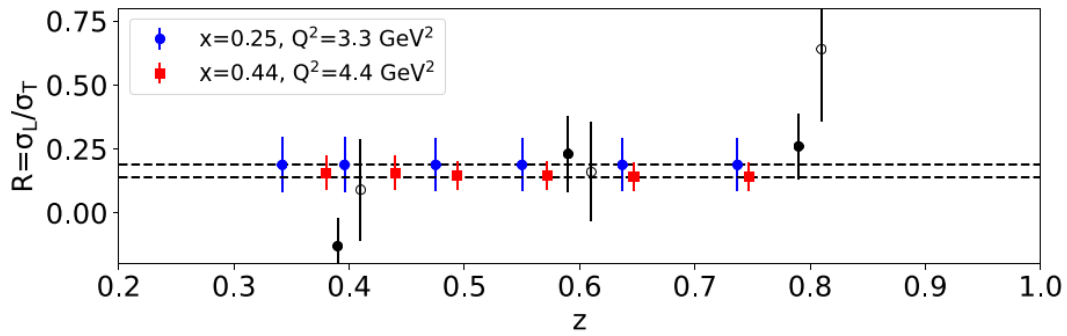
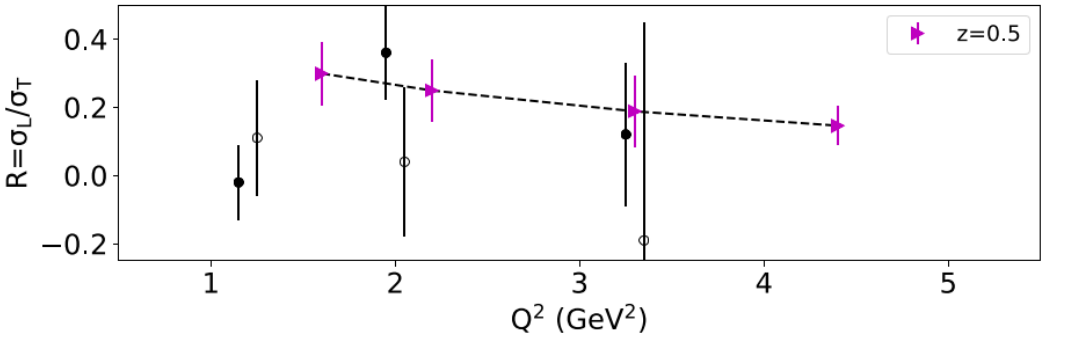
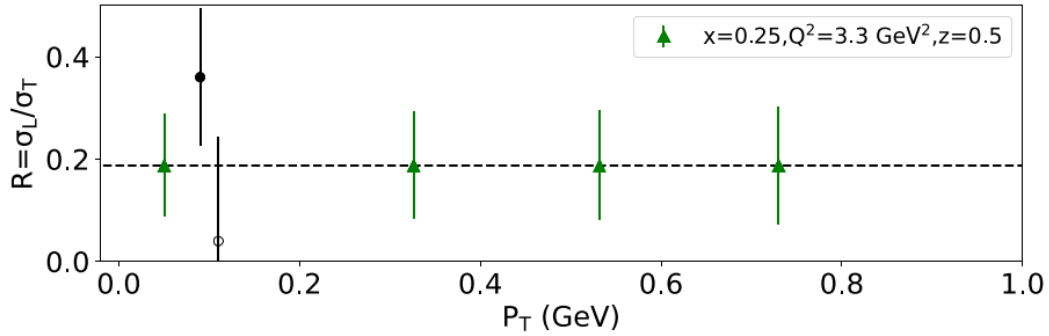
# Hall C: Current run period

- E12-06-104 $R=\sigma_L/\sigma_T$ in SIDIS on 1H and 2H
- E12-24-001 Nuclear Dependence (C,Cu) of R in SIDIS

- Verify whether $R_{SIDIS} = R_{DIS}$.
- Check the $z$-dependence of $R$ from the semi-inclusive to the exclusive region.
- Verify that $R_{SIDIS}$ anneals to $R_{DIS}$ at large $p_T$.
- Verify if $R_{SIDIS}$ follows the $Q^2$ dependence of $R_{DIS}$, at two values of $x$.
- Verify that $R^{\pi^+}_{SIDIS} = R^{\pi^-}_{SIDIS}$ and $R^{H}_{SIDIS} = R^{D}_{SIDIS}$.
- With a factor of ten reduced statistics: map $R^{K+}_{SIDIS}$ and $R^{K-}_{SIDIS}$.



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# Near future Hall C schedule

- FY26 assume 25 weeks and tentatively start in Feb 2026-July 2026.
  - Run HMS/SHMS experiments on the draft beam schedule
  - Complete E12-06-104  and E12-24-001
  - E12-06-107 Complete Pion Color Transparency
  - E12-22-001 N-Delta at low $Q^2$, Special beam energy to match Hall B.
  - E12-23-001 VCS at low $Q^2$, Special beam energy to match Hall B.
- FY27 run period is unclear when it would start.
  - Run standard HMS/SHMS experiments. Possibilities:
    - Run NucR, complete KaonLT,  non-standard beam energies
    - E12-24-007, Nuclear Dependence in Beam Normal Spin Asymmetry in Elastic Scattering, non-standard beam energy, add detector to SHMS.
    - Complete VCS experiment
    - E12-23-010 Color Transparency in Maximal Rescattering Kinematics
    - E12-20-007  Backward-angle Exclusive pi0 Production above the Resonance Region

# 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 $^{208}$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