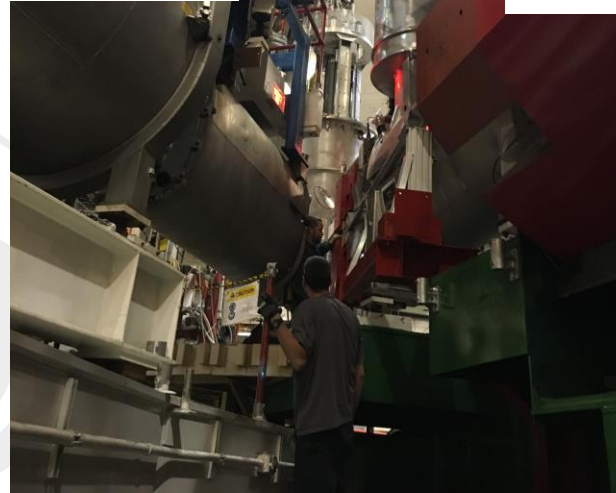


Hall C Status



HMS:
Electron Arm

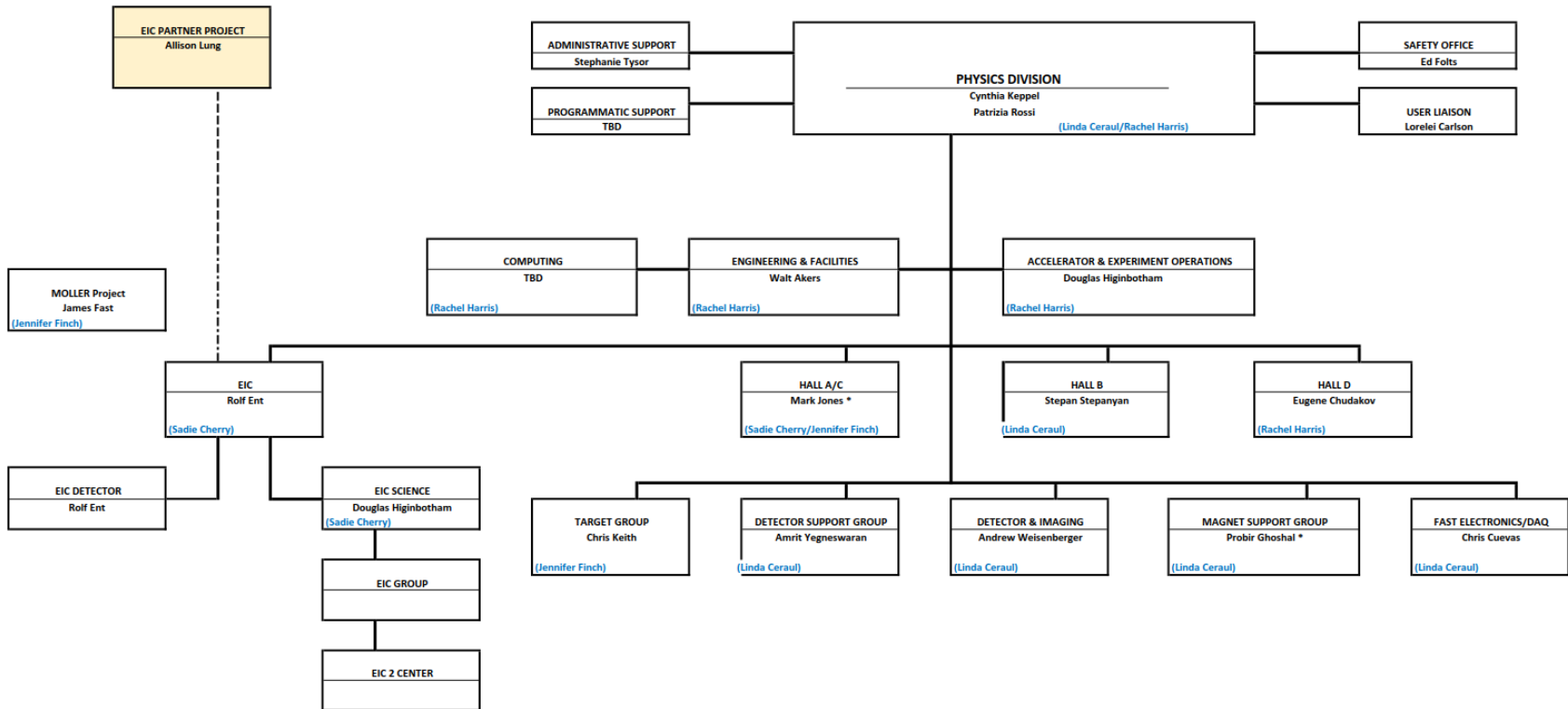
SHMS:
Pion Arm



Mark Jones, Acting Hall A/C Group Leader
February 2022 Hall C Collaboration Meeting

Changes within Physics Division

- Thia Keppel, new Physics Division Head
- Doug Higinbotham, new interface between accelerator and experiment operations
- Sadie Cherry and Jennifer Finch, new Hall A/C admin support
- Mark Jones, Acting Hall A/C Group Leader
- Bob Michaels, Acting Hall A/C Deputy Group Leader



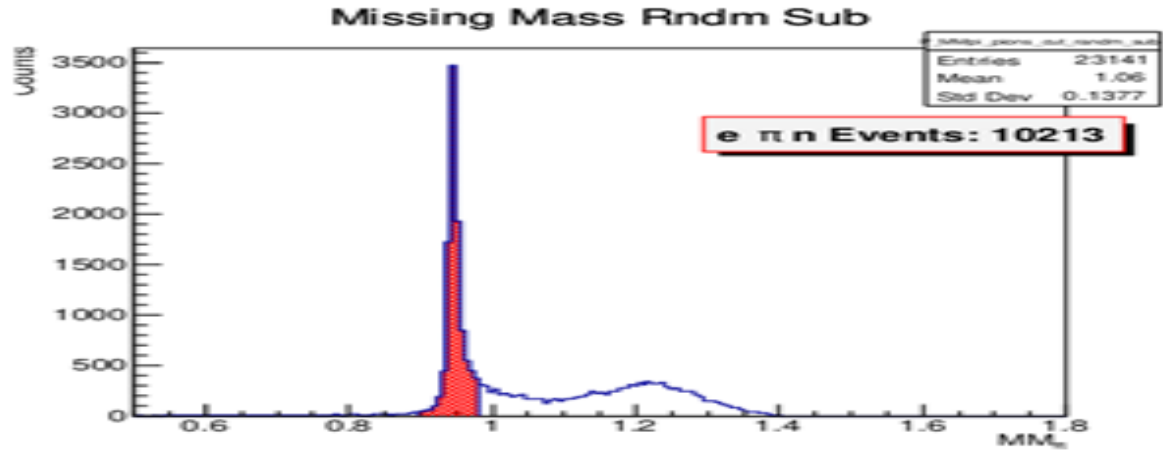
Successful Sept 2021 to Feb 2022 Run

Ran in Sept 2021 to Feb 2022

- E12-19-006 : Study of the L–T Separated Pion Electroproduction Cross Section at 11 GeV and Measurement of the Charged Pion Form Factor to High Q^2 (Continuation of experiment from FY21, low epsilon kinematics)

LH2 data

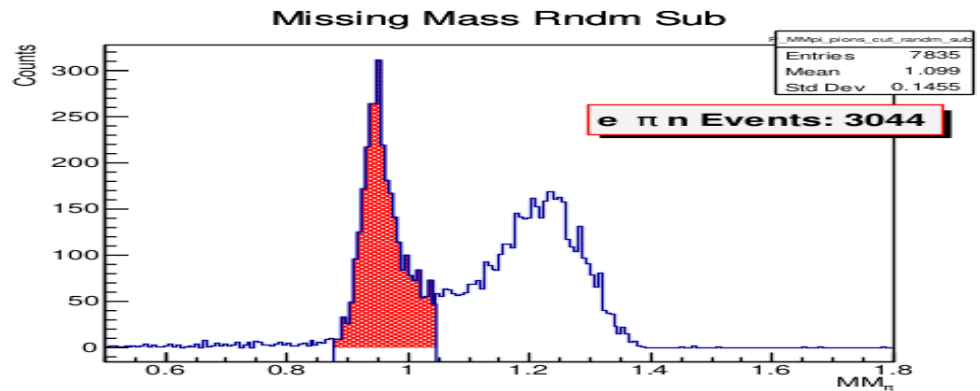
Online results:
Clean identification of $p(e, e' \pi^+) n$ final state



LD₂ Data

- L/T-separated π^- / π^+ Ratios
- Verification that σ_L is dominated by t-channel process

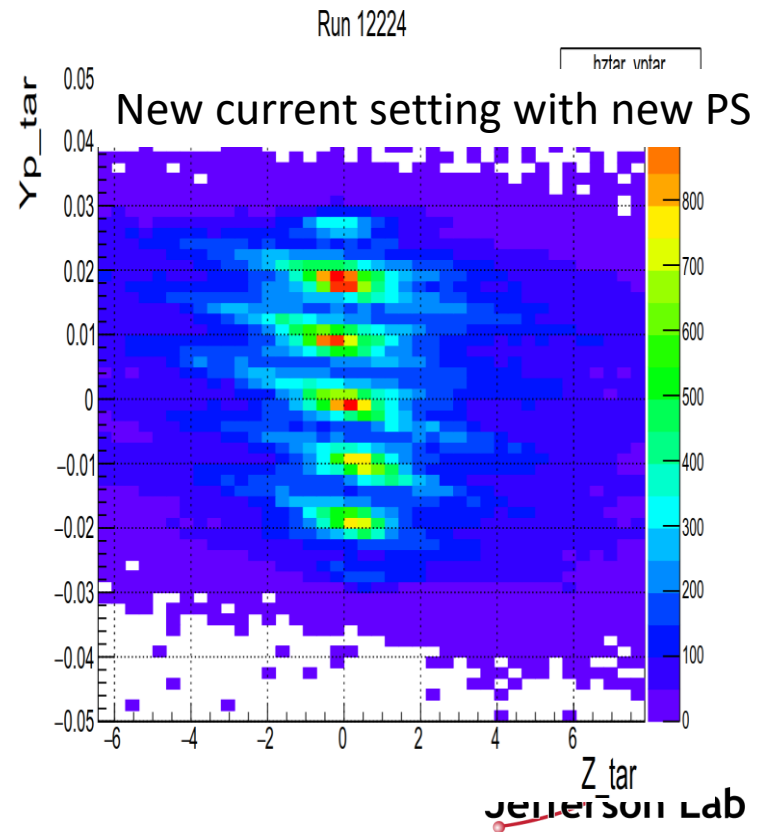
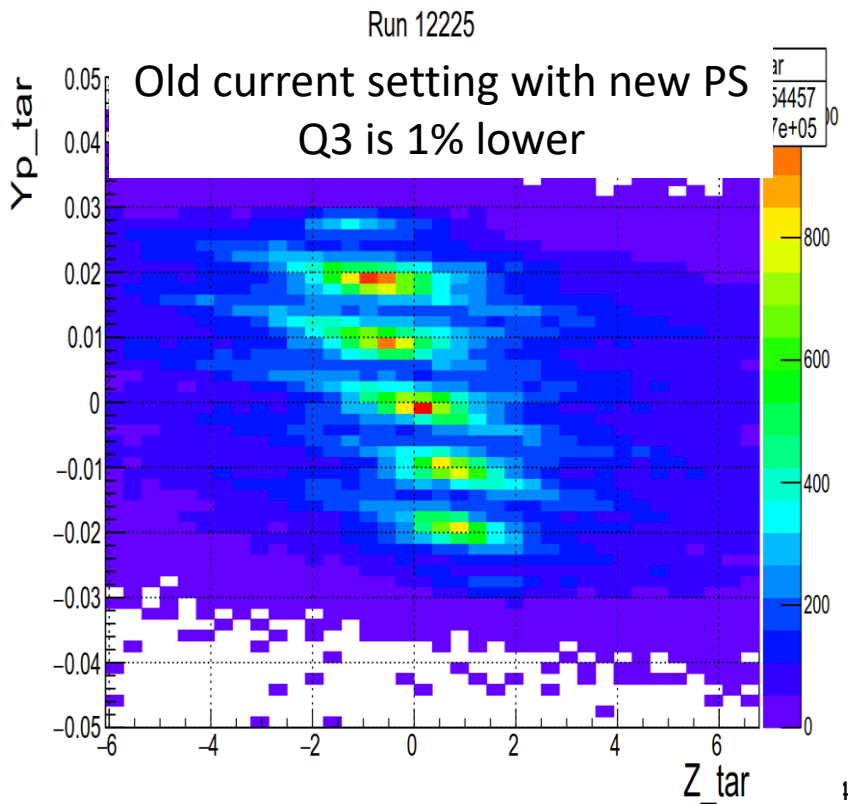
$d(e, e' \pi^-) p(p_{sp})$



$$R_L = \frac{\sigma_L[n(e, e' \pi^-) p]}{\sigma_L[p(e, e' \pi^+) n]} = \frac{|A_V - A_S|^2}{|A_V + A_S|^2}$$

New HMS Power Supplies

- Updated the HMS quad current setting program
 - Removed Q3 momentum dependent correction needed with old PS.
 - Check at $p = 1.03 \text{ GeV}/c$

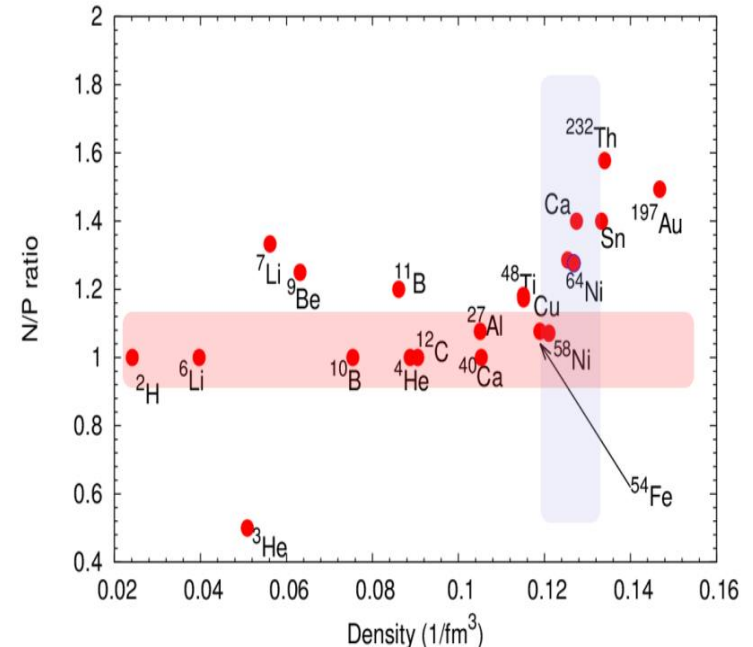


Hall C Next Run Period Schedule

Plan to run starting June 2022 through March 2023

- [E12-17-005](#) : *The CaFe Experiment: Short-Range Pairing Mechanisms in Heavy Nuclei*
- [E12-10-008](#) *Detailed studies of the nuclear dependence of F_2 in light nuclei.*
- [E12-06-105](#) *Inclusive Scattering from Nuclei at $x > 1$ in the quasielastic and deeply inelastic regimes*
- [E12-19-006](#) : *Study of the L–T Separated Pion Electroproduction Cross Section at 11 GeV and Measurement of the Charged Pion Form Factor to High Q^2 (high epsilon kinematics)*
- [E12-10-003](#) *Deuteron Electro-Disintegration at Very High Missing Momentum*

- Inclusive electron scattering
- Variety of nuclei to study:
 - Density effects
 - N/P= # Neutron/# Proton dependence
 - Isospin dependence (e.g. $^{40}\text{Ca}/^{48}\text{Ca}$)
- Study 2N and 3N short range correlations (SRC)
- Study the F_2 nuclear dependence (EMC effect)



Potential Issues in Next Run Period Schedule

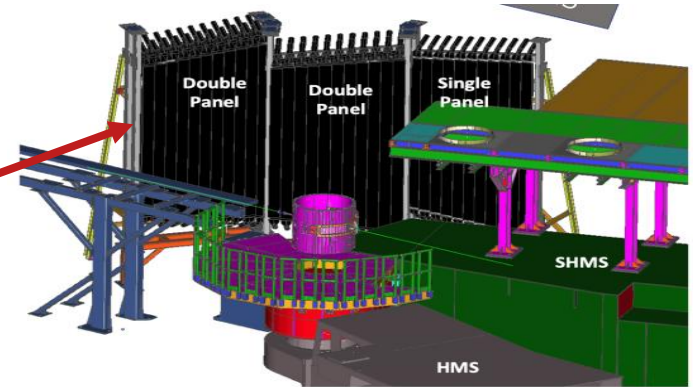
- Presently budget uncertainty, since Congress passed CR until mid-March
 - Need to have appropriation bill to run starting in June
- Beam energy uncertainty
 - Plan to have $E_{\text{linac}} = 1.047$ (Hall C = 10.544)
 - Will not know until April/May when new cavities installed.
 - Fall back $E_{\text{linac}} = 1.028$ (Hall C = 10.355)
 - Smaller ε range and increase error on the pion form factor.
- Total current limit due beam dump limit
 - Plans to update dump power limit to 1.1MW
 - When Hall A at 4 pass and 45uA, then Hall C 5 pass to 60uA.
- ^{48}Ca target work
 - Large amount of work needed to recover ^{48}Ca

Hall C Summer/Fall 2023 Run Period

Options of experiments to install after March 2023

- Standard SHMS/HMS

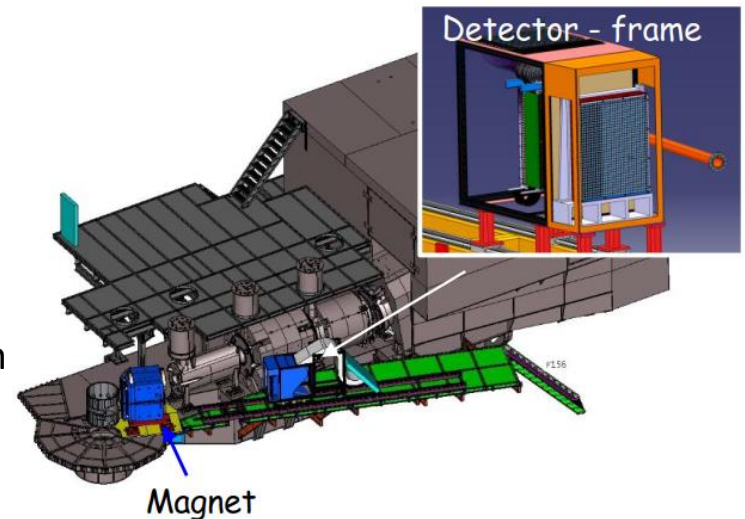
- [E12-06-104](#) $R=\sigma_L/\sigma_T$ in SIDIS
- [E12-06-107](#) Complete CT experiment
- [E12-11-107](#) Spectator tagged DIS $d(e, e' p_s)$
Install Large Angle Detector
HMS/SHMS detect electron



- HMS with Neutral Particle Spectrometer (NPS)

- NPS

- Magnet with calorimeter
- Calorimeter to detect γ and π^0
- Remove the SHMS HB magnet
- [E12-13-010](#) is two experiments
 - Exclusive Deeply Virtual Compton
 - σ_L and σ_T measured in exclusive π^0 production



Hall C work during SAD 2022

Usual SHMS/HMS maintenance

NPS preparatory work

- Pull rails from Physics Storage and clean. Sections assembled for detector platform under carriage.
- Weld support brackets to SHMS.
- Test fit of deck and support arm braces.
- Install Handrail sockets on deck.
- SHMS roof block cutting
- Install additional Target access platform support bracing
- Install new Target platform section wedge.

Will confirm that the SHMS can reach 5.5 deg and SHMS/HMS minimum angle is maintained!

SoLID proto type test setup

Hall C Far term Future

Papers and Workshops

- [Physics with CEBAF at 12GeV and Future Opportunities](#) paper
- [J-FUTURE](#) workshop 28-30 March 2022 JLab / Messina University
- ETC* Trento workshop 26 — 30 Sept 2022: [OPPORTUNITIES WITH JLAB ENERGY AND LUMINOSITY UPGRADE](#)
- Jay Benesch [talk](#) at the Hall A collaboration meeting on energy upgrade.
- Hall C Futures Task Force is preparing a Hall C specific document
 - For info see [wiki page](#)

Summary

- After delayed start and some hiccups, had a good overall Sept 2021 to Feb 2022 running for Pion-LT experiment.
 - Thanks to all the shifts workers!
- Need to decide about what to experiments to run in the 2023 and beyond
 - Collaborations are organized and well prepared
 - Excellent science
- Looking towards the Hall C Future
 - Attend the Friday afternoon session