Hall C Business Meeting

HALL C UB: MARIE BOER, DIPANGKAR DUTTA, BILL HENRY, STEPHEN KAY (SECRETARY), PETE MARKOWITZ, IOANA NICULESCU(CHAIR)



2024 Hall C UB Election Results

Election opened on May 20th, closed on June 20th.

- 4 excellent candidates
- 92 votes (out of 144 listed members)
 - Garth Huber (U Regina)
 - Carlos Yero (CUA)
 - Marie Boer (VTech)
 - Dipangkar Dutta (MSU)
 - Stephen Kay (U. York)
 - Ioana Niculescu (JMU)

Hall C Working groups

Spectrometer Performance and Future Upgrades

Convener: Stephen Kay (U. York)

AI/ML in Hall C

Conveners/contacts: Casey Morean(CUA)

Hall C Futures

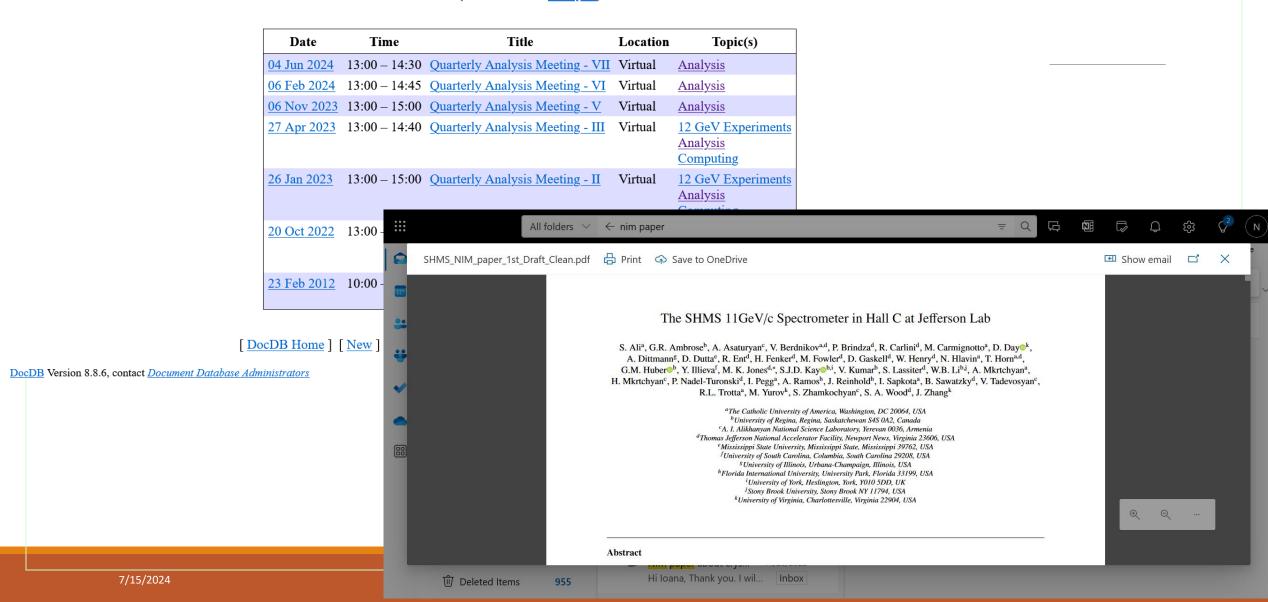
Conveners/contacts: Ioana Niculescu (JMU)

Experiment/Theory Interface

Conveners/contacts: Marie Boer (VTech), Christian Weiss (JLab)

Analysis Meetings

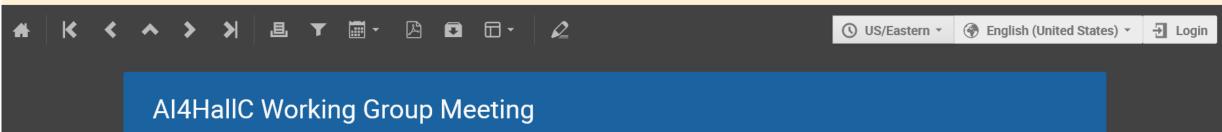
(Documents on Analysis)



AI/ML Working Group

A Please visit Jefferson Lab Event Policies and Guidance before planning your next event: https://www.jlab.org/conference_planning.





- Friday Feb 9, 2024, 3:00 PM \rightarrow 5:20 PM US/Eastern
- Casey Morean (Catholic University of America), Cristiano Fanelli (William & Mary, Jefferson Lab), Mark Jones (Jefferson Lab), Tanja Horn (Catholic University of America)

Description Al/ML has become ubiquitous in nuclear physics in the last few years and new possibilities have been emerging. This is an opportune time for Hall C to take advantage of these developments in computing technologies and statistical methods and define its path forward. The main goal of the Hall C AI/ML Working Group will be to provide a forum for discussion for anyone interested in defining this path, exploring possible applications of AI/ML in Hall C, and connecting to data scientists.

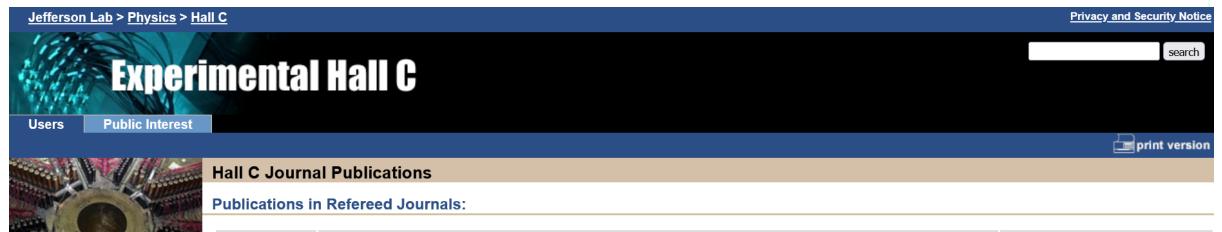
Hall C is the precision measurements hall at JLab providing pillars of measurements to constrain physics quantities like Parton Distribution Function and Parton Distribution Amplitudes. Because of this Hall C has a unique role and very different equipment and operation requirements from the other halls, e.g., Hall C operation has multiple subsystems (beam, spectrometer, target) whose drifts/changes must be monitored as they all directly impact performance and physics output of Hall C.

We had two previous productive meetings where two major needs were identified and discussed:

- 1.) Operations composed of optics, data preparation, and equipment and operation
- 2.) Uncertainty quantification for global physics analysis, e.g., PDF/PDA

For operations, a list of parameters relevant for monitoring was determined. A need for hands-on examples was also identified. More details are

Recent Publications



Closeup of the center of the G0 detector showing the phototubes

| Exp# | Title | Reference |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| E12-10-008 | First Measurement of the EMC Effect in 10B and 11B (2207.03850) | Phys. Rev. C 108, 035201 (Sept 2023) |
| E08-016 | The Qweak High Performance LH2 Target (arXiv:2303.07497) | NIM A, Vol 1053,168316 |
| E12-06-107 | Constraints on the onset of color transparency from quasi-elastic $^{12}\C(e,e'p)\$ up to $Q^2=14.2\C(e,e'p)\$ | Phys. Rev. C 108, 025203 (Aug 2023) |
| E12-16-007 | Determining the Proton's Gluonic Gravitational Form Factors (2207.05212) | Nature 615, 813-816 (2023) |
| | Searching for an Enhanced Signal of the onset of Color Transparency in Baryons with D(e,e'p)n scattering (2209.14400) | Physics 2022, 4(4), 1426-1439 |
| E12-15-001 | Measured proton electromagnetic structure deviates from theoretical predictions | Nature volume 611, 265 (2022) |
| | Performance of photosensors in high rate environment for gas Cherenkov (2011.11769) | JINST 17 P08022 |
| E94-110 | Measurements of R = σ_L/σ_T and the Separated Longitudinal and Transverse Structure Functions in the Nucleon Resonance Region (<u>nucl-ex/0410027</u>) | Phys. Rev. C 105 , 065205 (2022) |

PhD Theses





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Hall C PhDs & Master's Theses

| Author | Title | Date | Citation | Experiment | Advisor(s) |
|----------------------------|--------------------------------------------------------------------------------------------------------------|------------------|----------|------------|-------------------------------------------------|
| Richard Trotta | Determination of Pion and Kaon Structure Using the Sullivan Process at Moderate to large Fractional Momentum | May 2024 | | E12-09-011 | Tanja Horn (The Catholic University of America) |
| Casey Morean | Short Range Correlation measurements in the quasielastic region with an 11 GeV beam | December 2023 | | | Nadia Fomin (TENN) Dave Gaskell (JLAB) |
| Mingyu Chen | Precision Measurement of the Neutron Asymmetry An 1 at Large Bjorken x at 12GeV Jefferson Lab | November 2023 | | E12-06-110 | Jian-Ping Chen (JLAB) Xiaochao Zheng (UVA) |
| Melanie Rehfuss | Measuring the Neutron Spin Asymmetry A1n in the Valence Quark Region in Hall C at Jefferson Lab | May 2023 | | E12-06-110 | Mark Jones (JLAB) |
| Andres Vargas Hernandez | Search for Resonant WZ Production in the Fully Leptonic Final State at 13 TeV With the CMS Detector | May 2023 | | | Rolf Ent (JLAB) Tanja Horn (Catholic) |
| Ruonan Li | MEASUREMENT OF THE GENERALIZED POLARIZABILITIES | December | | E12-15-001 | Nikos Sparveris (Temple University) Mark Jones |

HOME

Summary

Exciting 12 GeV program is ongoing in Hall C:

Many analyses are approaching completion.

(see Hall A/C - Recent Results and Research Highlights)

Publications ©

Working Groups have been established to explore and push forward topics of interest

Great potential for Hall C physics beyond 12 GeV

(see Hall A/C - Prospects for Positrons and 20+ GeV)