Stephen Wood

Users Meeting
August 15-16, 2013
# Publications in last year

## Published

<table>
<thead>
<tr>
<th>Title</th>
<th>Journal/Conference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bucking Coil Implementation on PMT for Active Cancelling of Magnetic Field</td>
<td>NIM - accepted Arxiv: 1307.0896</td>
</tr>
<tr>
<td>The lead-glass electromagnetic calorimeters for the magnetic spectrometers in Hall C at Jefferson Lab</td>
<td>NIM, A719, 85 (2013)</td>
</tr>
<tr>
<td>E01-011 Observation of the $^{7}\Lambda$He hyper nucleus by the (e,e’K+) reaction</td>
<td>PRL 110, 012502</td>
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</table>

## Spinoffs

<table>
<thead>
<tr>
<th>Title</th>
<th>Journal/Conference</th>
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</thead>
<tbody>
<tr>
<td>Impact of nuclear dependence of $R=sL/ST$ on antishadowing in nuclear structure functions</td>
<td>PRC 86, 045201</td>
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<tr>
<td>A detailed study of the nuclear dependence of the EMC effect and short-range correlations</td>
<td>PRC 86, 065204</td>
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## Submitted

<table>
<thead>
<tr>
<th>Title</th>
<th>Arxiv:</th>
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<tbody>
<tr>
<td>E08-016 First Determination of the Weak Charge of the Proton</td>
<td>1307.5275</td>
</tr>
<tr>
<td>E04-101 First Measurement of the Neutral Current Excitation of the Delta Resonance on a Proton Target</td>
<td>1212.1637</td>
</tr>
</tbody>
</table>

## PhDs: John Leacock, Anusha Liyanage, Rakitha Beminiwattha, Buddhini Waidyawansa (95 PhDs total)
SOS is gone
SHMS Construction
SHMS Detectors @ JLab

Aerogel assembly and testing

Preshower cosmic tests

Heavy gas Cerenkov

Shower – waiting for SHMS hut
Counting House Renovation
Counting House Renovation

- Air Conditioning Replaced
- Elevator Reconditioned
- New roof
- New 2\textsuperscript{nd} floor windows
- Ceilings in counting houses
- New bathrooms + shower
• Partition for tech area
• Conference room
• Drop ceiling (for a not noisy conf. room)
• Partition control/computer racks
• Cubicles/desks

• Users should emphasize importance of usable conf. room
<table>
<thead>
<tr>
<th>NUMBER</th>
<th>TITLE</th>
<th>CONTACT PERSON</th>
<th>HALL</th>
<th>DAYS REQUESTED</th>
<th>DAYS AWARDED</th>
<th>SCIENTIFIC RATE</th>
<th>PAC DECISION</th>
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</thead>
<tbody>
<tr>
<td>PR12-13-003</td>
<td>An initial study of hadron decays to strange final states with GlueX in Hall D</td>
<td>Curtis A. Meyer</td>
<td>D</td>
<td>200</td>
<td>200</td>
<td>A</td>
<td>Approved</td>
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<tr>
<td>PR12-13-004</td>
<td>Symmetry Tests of Rare Eta Decays to All-Neutral Final States: The Jlab Eta Factory (JEF) Experiment</td>
<td>Liping Gan</td>
<td>D</td>
<td>136</td>
<td></td>
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<td>Deferred</td>
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<tr>
<td>PR12-13-008</td>
<td>Measuring the Charged Pion Polarizability in the $\gamma \rightarrow \pi^+\pi^-$ Reaction</td>
<td>Rory Miskimen</td>
<td>D</td>
<td>25</td>
<td>25</td>
<td>A-</td>
<td>Approved</td>
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<tr>
<td>PR12-13-007</td>
<td>Measurement of Semi-Inclusive $\pi^0$ Production as Validation of Factorization</td>
<td>R. Ent</td>
<td>C</td>
<td>26</td>
<td>26</td>
<td>A-</td>
<td>Approved</td>
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<tr>
<td>PR12-13-001</td>
<td>Precision Measurements and Studies of a Possible Nuclear Dependence of R</td>
<td>Simona Malace</td>
<td>C</td>
<td>34</td>
<td></td>
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<td>Deferred</td>
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<tr>
<td>PR12-13-011</td>
<td>The Deuteron Tensor Structure Function b1</td>
<td>Karl Slifer</td>
<td>C</td>
<td>30</td>
<td>30</td>
<td>A-</td>
<td>C1</td>
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<tr>
<td>PR12-13-009</td>
<td>Wide-angle Compton scattering at 8 and 10 GeV photon energies</td>
<td>Bogdan Wojtsekhowski</td>
<td>C</td>
<td>42</td>
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<tr>
<td>PR12-13-010</td>
<td>Exclusive Deeply Virtual Compton and Neutral Pion Cross-Section Measurements in Hall C</td>
<td>Carlos Munoz Camacho</td>
<td>C</td>
<td>65</td>
<td>53</td>
<td>A</td>
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<tr>
<td>PR12-13-005</td>
<td>Measurement of $^{16}$O($\gamma,\alpha$)$^{12}$C with a bubble chamber and a bremsstrahlung beam</td>
<td>Claudio Ugalde</td>
<td>Inj</td>
<td>14</td>
<td>14</td>
<td>A-</td>
<td>Approved</td>
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<tr>
<td>PR12-13-012</td>
<td>Nucleon Momentum Distributions in Asymmetric Nuclei A Comparison of $3$He(e, e2p) and $3$H(e, e2p)</td>
<td>Lawrence Weinstein</td>
<td>A</td>
<td>32</td>
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<tr>
<td>C12-12-004</td>
<td>CREX: Parity-Violating Measurement of the Weak Charge Distributing of $^{48}$Ca to 0.02 fm Accuracy</td>
<td>Seamus Riordan</td>
<td>A</td>
<td>45</td>
<td>45</td>
<td>A-</td>
<td>Approved</td>
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</table>
## Approved and Conditional 12 GeV Hall C Experiments

<table>
<thead>
<tr>
<th>Number</th>
<th>Experiment</th>
<th>Grade</th>
<th>Approved Days</th>
<th>Cond. Days</th>
<th>Non-standard Equipment</th>
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<tbody>
<tr>
<td>E12-06-101</td>
<td>Pion Form Factor</td>
<td>A</td>
<td>52</td>
<td></td>
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<tr>
<td>E12-06-104</td>
<td>SIDIS R</td>
<td>A-</td>
<td>40</td>
<td></td>
<td></td>
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<tr>
<td>E12-06-105</td>
<td>x&gt;1</td>
<td>A-</td>
<td>32</td>
<td></td>
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<tr>
<td>E12-06-121</td>
<td>He3 $g_2$</td>
<td>A-</td>
<td>29</td>
<td></td>
<td>Polarized He3 target</td>
</tr>
<tr>
<td>E12-07-105</td>
<td>$(e,e'\pi)$ Exclusive Factorization</td>
<td>A-</td>
<td>36</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E12-09-011</td>
<td>$(e,e'K)$ Exclusive Factorization</td>
<td>B+</td>
<td>40</td>
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<tr>
<td>E12-09-017</td>
<td>SIDIS $P_t$</td>
<td>A-</td>
<td>32</td>
<td></td>
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<tr>
<td>E12-09-002</td>
<td>Charge Symmetry Violation</td>
<td>A-</td>
<td>22</td>
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<tr>
<td>E12-10-002</td>
<td>F2 @ large x</td>
<td>B+</td>
<td>13</td>
<td></td>
<td></td>
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<tr>
<td>E12-10-003</td>
<td>d(e,e'p)</td>
<td>B+</td>
<td>21</td>
<td></td>
<td></td>
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<tr>
<td>E12-10-008</td>
<td>EMC</td>
<td>A-</td>
<td>23</td>
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<tr>
<td>E12-06-107</td>
<td>Color Transparency</td>
<td>B+</td>
<td>26</td>
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<tr>
<td>E12-06-110</td>
<td>He3 A1n</td>
<td>A</td>
<td>36</td>
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<td>Polarized He3 target</td>
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<tr>
<td>E12-11-002</td>
<td>He4(e,e'pol(p))</td>
<td>B+</td>
<td>37</td>
<td></td>
<td>FPP in HMS</td>
</tr>
<tr>
<td>E12-11-009</td>
<td>Neutron Form Factor</td>
<td>B+</td>
<td>50</td>
<td></td>
<td>Magnet + Neutron polarimeter</td>
</tr>
<tr>
<td>E12-11-107</td>
<td>EMC d(e,e' backward p)</td>
<td>B+</td>
<td>40</td>
<td></td>
<td>LAD (Hall B TOF bars)</td>
</tr>
<tr>
<td>E12-13-007</td>
<td>SIDIS Pi0</td>
<td>A-</td>
<td>26</td>
<td></td>
<td>Neutral Partial Spect.</td>
</tr>
<tr>
<td>E12-13-010</td>
<td>DVCS + Exclusive Pi0</td>
<td>A</td>
<td>53</td>
<td></td>
<td>Neutral Partial Spect.</td>
</tr>
<tr>
<td>C12-13-011</td>
<td>Deuteron Tensor SF $b_1$</td>
<td>A-</td>
<td>30</td>
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<td>Polarized ND3</td>
</tr>
</tbody>
</table>

| Total Days | 638 | 7.3 Years @ 25 Weeks/year |
Hall C Timeline

- Mid 2013  SHMS installation began
- Fall 2013  SHMS Shield house

<table>
<thead>
<tr>
<th>Magnet</th>
<th>Delivery Date</th>
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<tbody>
<tr>
<td>Q1</td>
<td>May 2014</td>
</tr>
<tr>
<td>Dipole</td>
<td>May 2015</td>
</tr>
<tr>
<td>Q2, Q3</td>
<td>May/July 2015</td>
</tr>
<tr>
<td>3° Horizontal Bender</td>
<td>May 2014</td>
</tr>
</tbody>
</table>

Note: Some assembly required

Dipole installation after Q3 install

- 2014  Shower counter and electronics/DAQ
- 2015  Detector installation
- 2016  SHMS commissioning

Commissioning Experiments in Hall C
Early running plans – Year 1

2015: ~25 PAC days – Commissioning “Experiment”

9 days of E12-06-107 search for color transparency
   A(e,e’p) only – “easy” coincidence measurement
E12-10-002 $F_{2}^{p,d}$ structure functions at large $x$
   Momentum scans help understand acceptance
2 days E12-10-108 EMC Effect
   Integrate light nuclei with $F_{2}$ run,
   Point target helps acceptance studies.

3 days of E12-10-003 d(e,e’p)
   If time available
   Push to lower cross sections
Early running plan – Years 2

2016?-17:

E12-09-017 $P_t$ dependence of basic SIDIS cross sections
Push particle ID capabilities of SHMS
E12-09-002 Precise $\pi^+\pi^-$ ratios in SIDIS – Charge Symmetry
Detector efficiencies
E12-09-011 L/T separated $p(e,e'K^+)$ factorization test
Easiest L/T separation

2017?-18:

E12-06-121 $g_2^n$ measurements at fixed $Q^2$
First polarized $^3$He target experiment in Hall C

$A_1^n, F_\pi, GeN?$
Pre SHMS running?

Could we take/use beam before SHMS ready?

Probably not.

Nevertheless

E12-11-107 exploring possibility of a test run of the Large Acceptance Detector – LAD (reused Hall B bars)

\[ e + d \rightarrow e' + p (\text{backward}) \]

Detector Test, Rate and Accidentals test

Needs

HMS
Target (\(^4\)He)
Scattering chamber mods
DAQ (HMS+72 channels)
Beamline & 1uA beam
Detector construction data preservation

Wealth of information has been (presumably) generated during the construction of the SHMS detectors.

- Paper, electronic logbooks
- Q/A, test information
- Maps/element locations, serial numbers
- Spreadsheets
- Photographs
- Design reports, proposals

Needed for
- Detector commissioning
- Data analysis
- Generation of user manuals, tech reports, NIM papers

Information should be archived at JLab. For now:
- Preserve records
- Send electronic records to SAW
INT – Institute for Nuclear Theory

From John Arrington – member of INT advisory committee

From discussions at last INT advisory committee meeting:

1) Is JLab physics being sufficiently represented at INT workshops?
2) Does JLab community feel it is not sufficiently represented and is thus discouraged from submitting workshop proposals?

Recent INT workshops:

Feb 2013 – Short Range Structure of Nuclei
2013 – Nuclei and Fundamental Symmetries (Qweak is represented)
2012 – Orbital Angular Momentum in QCD
2012 – Summer school for Lattice QCD for nuclear physics
2009 – 12 GeV Physics
Where are former Hall C students?

1996-2013 95 PhDs from Hall C experiments

18 Faculty, Teaching  Tenured/Tenure Track
8 Medicine (Some faculty)
16 Laboratory (Jlab, LANL, ANL, Naval Research, LIGO, Spring-8, IN2P3, NIST, KEK, …)
26 Postdoc
9 Industry – Technical
5 Law, Financial, Patents
13 Unknown

Excluding postdocs

50% Faculty or Laboratory
20% Industry, law, finance, patents
12% Medical
18% Unknown

Senior Patent Examiner – Finland
Patent Attorney – Germany
Technical Staff - Lincoln Laboratory
Product Manager – Perfectsense Digital (Media)
Director of Production – Micro-g LaCoste (gravity meters)
Senior Quantitative Strategist – Hedge Fund

Many not particle/nuclear physics
Notes

Minutes of weekly Hall C meetings posted in Hall C Wiki
https://hallcweb.jlab.org/wiki/index.php/Hall_C_Weekly_Meeting

Current User Group Board – Eric Christy (9/14), Donal Day (9/13), Kawtar Hafidi (9/15), Mark Jones (9/13), Pete Markowitz (9/14), Gabriel Niculescu (9/15)

Donal Day and Mark Jones terms ending. Donal day is collecting nominations for email election in September.

Proposed bylaw changes to “SHMS-HMS User’s Group”. Changes name to “Hall C User’s Group”. Vote will be conducted by email with board elections.

Slides from this meeting will be posted on agenda web page. Please email slides to saw@jlab.org

Hall C Party Friday night, directions available 7PM