

Activity Report, Calendar Year 2012

Name: Wouter Deconinck

Major Contributions: In May 2012, the Qweak experiment collected its last data and transitioned into the analysis phase. A first preliminary result on the measurement of the weak charge of the proton was presented at the Division of Nuclear Physics meeting in the fall of 2012. Two summer research students worked on data analysis for the Qweak experiment: one W&M students, and one REU student. Two graduate students continue to work with me on Compton polarimetry (Cornejo) and track reconstruction (Gray). A first-year graduate student (Bartlett) worked with me over the summer before starting his first year of coursework. I was co-organizer of the first ever APS session on gender and sexual diversity in physics, and I was invited by the APS to speak on gender diversity for 150 physics department chairs.

Scholarly and Professional Activities-Research:

Invited Talks:

- "Precision Measurements at Jefferson Lab: Testing the Standard Model and Exploring Beyond," LNF Mini-workshop on Jefferson Lab at 12 GeV, Frascati, Italy, December 2012.
- "The Q-Weak Experiment: A Search for New Physics at the TeV Scale," Jefferson Lab User's Group Meeting, Newport News, June 2012.

Contributed Talks/Posters:

- "Atomic Hydrogen Polarimetry for Precision Electroweak Experiments," APS Division of Nuclear Physics Fall 2012 Meeting, Newport Beach, California, October 2012.

Refereed Papers Published:

- "New Measurements of the Transverse Beam Asymmetry for Elastic Electron Scattering from Selected Nuclei," S. Abrahamyan et al. [HAPPEX and PREX Collaborations], [Phys. Rev. Lett. 109 \(2012\) 192501](#).
- "Measurement of the Neutron Radius of 208Pb Through Parity-Violation in Electron Scattering," S. Abrahamyan et al. [PREX Collaboration], [Phys. Rev. Lett. 108 \(2012\) 112502](#).
- "New Precision Limit on the Strange Vector Form Factors of the Proton," Z. Ahmed et al. [HAPPEX Collaboration], [Phys. Rev. Lett. 108 \(2012\) 102001](#).
- "[The Q-Weak Experiment: A Search for New Physics at the TeV Scale](#)," W. Deconinck, Proceedings of the 14th Workshop on High Energy Spin Physics, December 2011.
- "Beam-helicity asymmetry arising from deeply virtual Compton scattering measured with kinematically complete event reconstruction," A. Airapetian et al. [HERMES Collaboration], JHEP 1210 (2012) 042.
- "Beam-helicity and beam-charge asymmetries associated with deeply virtual Compton scattering on the unpolarised proton," A. Airapetian et al. [HERMES Collaboration], JHEP 1207 (2012) 032.
- "Measurement of the virtual-photon asymmetry A_2 and the spin-structure function g_2 of the proton," A. Airapetian et al. [HERMES Collaboration], Eur. Phys. J. C72 (2012) 1921.
- "Beam-Target Double Spin Asymmetry A_{LT} in Charged Pion Production from Deep Inelastic Scattering on a Transversely Polarized He-3 Target at $1.4 < Q^2 < 2.7 \text{ GeV}^2$." J. Huang *et al.*, 1108.0489.

Unpublished Reports:

- "Science Requirements and Conceptual Design for a Polarized Medium Energy Electron-Ion Collider at Jefferson Lab," S. Abeyratne et al.; [1209.0757 \[physics.acc-ph\]](#).
- "Multiplicities of charged pions and kaons from semi-inclusive deep-inelastic scattering by the proton and the deuteron," A. Airapetian et al. [HERMES Collaboration]; [1212.5407 \[hep-ex\]](#).
- "Azimuthal distributions of charged hadrons, pions, and kaons produced in deep-inelastic scattering off unpolarized protons and deuterons," A. Airapetian et al. [HERMES Collaboration]; [1204.4161 \[hep-ex\]](#).

Grants and Awards:

As PI:

- NSF MPS "Precision Electroweak Measurements using Parity-Violating Electron Scattering", 06/2012-05/2015, \$300k.
- NSF REU (with co-PI Jack Kossler): 06/2012-05/2014, \$180k.
- W&M Summer Research Grant: Summer 2012.

- Jefferson Science Associates “Promising Young Scientist Program,” \$2k.

As co-PI:

- Brookhaven National Lab Electron-Ion Collider R&D, 06/01/2012–05/31/2013, \$15k (with PI Dipangkar Dutta, Mississippi State University).

Teaching:

Courses:

- Spring 2012: Phys102P, 2 sessions (quality of instructor: 3.72, 3.32).
- Spring 2012: Phys155 (with David Specht), Phys255 (with Rachel Taverner).
- Fall 2012: Phys107P, 1 session (quality of instructor 4.40).
- Fall 2012: Phys255 (with David Specht).
- Fall 2012: Phys481, “Science Writing” with Jeni Hackett.
- Fall 2012: Phys600, “Particle and Nuclear Physics” with Valerie Gray, Anne Norick, Dun Zhang.
- Fall 2012: Phys601, “Classical Mechanics” (quality of instructor 4.15).

Senior/Honor Theses (none)

Summer Research Students

- David Specht: “Correcting for Beam Effects in the Qweak Experiment,” W&M.
- Quinn Hailes: “Track Reconstruction in the Qweak Experiment,” Hampton University, REU student.

Semester Research Students

- Rachel Taverner: “Correcting for Beam Effects in the Qweak Experiment,” W&M, Spring 2012.
- Jonathan Rigby: “Track Reconstruction in the Qweak Experiment,” W&M, Fall 2012.

Graduate Students:

- Juan Carlos Cornejo: Compton polarimetry for the Qweak experiment at JLab, anticipated graduation 2014.
- Valerie Gray: Track Reconstruction and simulations for the Qweak experiment at JLab, started Fall 2011.
- Kurtis Bartlett: Simulation of the Qweak experiment in Geant4, started Fall 2012.

Post Docs (none)

Service:

Department:

- Fall 2010-present: Graduate admissions committee, represented department at SPS Congress job fair.
- Fall 2011-present: Computer committee.
- Fall 2012-present: External relations committee.

University:

- Natural and Computational Sciences Judging Panel for the 2012 Undergraduate Mentoring Awards
- LGBT Climate Working Group, reporting to president Reveley, Summer 2012.

Physics Community:

- Coordinator for electron beam polarimetry at the Electron-Ion Collider. Co-author of “Science Requirements and Conceptual Design for a Polarized Medium Energy Electron-Ion Collider at Jefferson Lab,” a white paper on the EIC design at Jefferson Lab.
- PI on Jefferson Science Associates Initiatives Fund “Promising Young Physicist” project: selection of JLab postdocs for mock job interviews, including review and feedback on job application dossiers and presentations.
- LGBT issues/gender diversity:
 - Co-organizer of invited session (with APS Committee on Minorities and Status of Women in Physics) at APS March 2012 meeting on “Sexual and Gender Diversity in Physics”.
 - “Gender and Sexual Diversity Issues in Physics: The Audience Speaks,” N. Ackerman, T. J. Atherton, W. Deconinck, M. L. Falk, S. Garmon, E. Henry, E. Long; 1206.4112 [physics.soc-ph].
 - Invited panel talk at the APS/AAPT Physics Department Chairs Conference on “Developing an Inclusive Diversity Climate,” June 2012.
- Reviewer for National Instruments and Methods, National Science Foundation.

Public Outreach:

- Organizer of “Saturday Morning Physics,” a monthly public lecture serie, since Spring 2012.
- Co-organizer PhysicsFest, Fall 2012.