

CURRICULUM VITAE
TIMOTHY R. ANDEEN, JR.

Address: 410 Riverside Drive, Apt. 74
New York, NY 10025, USA
Telephone: +1 847 471-3180
E-mail: tandeen@nevis.columbia.edu
Nationality: United States
Languages: Native language is English, basic/intermediate French, basic German.

Education

Ph.D. Experimental Particle Physics, June 2008

Northwestern University, Department of Physics and Astronomy, Evanston, IL

Thesis: *Measurement of the W Boson Mass with the $D\bar{O}$ Run II Detector using the Electron P_T Spectrum*

Advisors: Prof. Heidi Schellman, Dr. Jan Stark

B.A. Physics, *Cum Laude*, 2001

Gustavus Adolphus College, St. Peter, MN

Employment

Nevis Laboratory, Columbia University, New York, NY

Post-doctoral Researcher: ATLAS Collaboration

July 2010 – present

CERN, Geneva, Switzerland

CERN Fellow: ATLAS Collaboration

June 2008 – June 2010

Northwestern University, Evanston, IL

Research Assistant: $D\bar{O}$ Collaboration

2003 – 2008

Teaching Assistant: Department of Physics and Astronomy

2001 – 2003

Gustavus Adolphus College, St. Peter, MN

Teaching Assistant: Department of Physics

1999 – 2001 (Academic Year)

Fermi National Accelerator Laboratory, Batavia, IL

Summer Research Assistant: Muon Collider Collaboration

1999, 2000 (Summer)

Research

ATLAS EXPERIMENT (2008 – PRESENT)

- Initiated ATLAS search for single production of top partners in Composite Higgs Models (CHM). Paper using Z boson tagged events submitted to JHEP, and upcoming paper exploiting novel jet substructure methods to search for final states with W -boson decays. Contributed to sections on top partners and jet algorithms to US high-energy physics long-term planning report (Snowmass). Obtained funding through Columbia-Glasgow Research Exchange Award to prepare for top partner searches at 14 TeV LHC run.

- Searched for new physics in $t\bar{t}$ resonances, supervising a graduate student in improving the boosted top quark selection.
- Analyzed full 2011 data set in the search for exotic physics with leptons and photons. Set the strongest limit for lepton compositeness at the time. Published in *Phys. Review D*.
- Lead testing of a new analog-to-digital converter for ATLAS upgrade. Presented results in ATLAS design review, resulting in selection of ADC as the baseline for the ATLAS LAr Calorimeter Phase I upgrade. Supervised graduate students in hardware qualification (precision, calibration, radiation hardness) and coordinated with an Electrical Engineering professor, EE graduate student and Nevis engineers. Implemented a new algorithm for real-time digital calibration of pipe-line analog-to-digital converters, critical for the high-speed readout of the upgraded ATLAS detector (published in 2013 JINST 8 P09008, second paper in preparation).
- Co-manage local Tier3 computing cluster.
- Developed and implemented the fast (24 hour) calibration loop for analyzing data from silicon microstrip tracker. This calibration removes poorly functioning detector channels before full reconstruction.
- Maintained and extended reconstruction software which incorporates online detector and data quality conditions to improve the reliability and efficiency of the ATLAS track finder.

DØ EXPERIMENT (2003 – 2009)

- Analyzed the Electron P_T and transverse mass spectrum from the $W \rightarrow e\nu$ channel of the 1 fb^{-1} Run IIa data set to extract the most precise single measurement of the W boson mass at the time. The W mass is one of the most important fundamental parameters of the Standard Model and with the top quark mass provides an indirect constraint on the mass of the Standard Model Higgs boson.
- Studied the precise electromagnetic and hadronic energy response of the calorimeter with substantial upstream material. Implemented a calibration used by the collaboration which accounted for the η -dependent variation in the material. Developed and implemented a fit for the final calibration of the EM and Hadronic calorimeter energy scale using $Z \rightarrow ee$ events.
- Responsible for luminosity system data acquisition for two years. During this time made significant upgrades to the system, trained new experts, and daily monitored the recorded and validated data from the luminosity detector and data quality from all detector sub-systems to provide accurate normalization for all analyses.

Computing Experience

Platforms and Applications

UNIX/LINUX, OSX, Microsoft Windows, ROOT, Maple, GEANT, PYTHIA, experience with large code frameworks, Grid computing and batch system administration,

Languages

Python, Perl, VHDL, C++, C, PHP, Java, UNIX shell scripting, L^AT_EX.

Teaching and Outreach

- Fall 2014, organized Atlas Virtual Visit and a particle physics masterclass for Columbia University Double Discover Center, a program for local, first generation college bound high school students.
- Organize Nevis Laboratory Seminar (speakers from particle and nuclear physics, astrophysics and medical physics)
- Fall 2012 to Spring 2013, particle physics lecturer for Columbia University Science Honors Program for high school students (Saturday morning, weekly)

- Summer 2010 to present, supervise undergraduates in summer research projects through Nevis Laboratory REU program
- Fall 2010 to present, substitute lecturer for undergraduate and graduate physics classes
- Fall 2001 to Spring 2003, Introductory Physics and Astronomy Discussion Section, teaching assistant
- Fall 1999 to Spring 2001, Introductory Physics Laboratory and Astronomy Observatory, laboratory assistant

Selected Presentations

- *Searches for vector-like quarks, $t\bar{t}$ and $t\bar{b}$ resonances with the ATLAS detector*, 37th International Conference on High Energy Physics, Valencia, Spain. July 2014.
- *VLQ Top Partner Single Production*, Snowmass Planning Workshop, Seattle, WA July 2013.
- *US ATLAS Involvement with the Upgrade*, US ATLAS Annual Workshop, Ann Arbor, MI, August 2012.
- *Results from Recent ATLAS Searches*, LANL HEP Theory Group Summer Workshop, Santa Fe, NM, July 2012.
- *Upgraded readout electronics for the ATLAS Liquid Argon Calorimeters at the High Luminosity LHC*, XVth International Conference on Calorimetry in High Energy Physics, Santa Fe, NM, June 2012.
- *Review of ADC Development and Proposed Plans, Liquid Argon Upgrade*, ATLAS Upgrade Week, Stanford, CA, March 2012.
- *Measurement of the W Mass at $D\bar{D}$* , HEP Seminar, Imperial College, London, UK, October 2009.
- *Electroweak Measurements at the Tevatron*, XXIst Rencontres de Blois, Blois, France, June 2009.
- *The Z transverse Momentum Distribution*, XLIIIrd Rencontres de Moriond (EW), La Thuile, Italy, March 2008.
- *Toward a Measurement of M_W* , Research Progress Meeting, Berkeley National Laboratory, Berkeley, CA, December 2007.
- *Uncertainties in the Direct Measurement of the W Boson Mass*, New Perspectives Conference, Fermilab, Batavia, IL, June 2006.
- *QCD Inputs to W Mass Measurement*, PHENO Conference, University of Wisconsin, Madison, WI, May 2006.
- *QCD Inputs to W Mass Measurement*, APS April Meeting, Dallas, TX, April 2006.

Selected Publications

- *Search for pair and single production of new heavy quarks that decay to a Z boson and a third generation quark in pp collisions at $\sqrt{s} = 8$ TeV with the ATLAS detector*, G. Aad *et al.*, submitted to JHEP, arXiv:1409.5500[hep-ex].
- *Measurement of the W boson mass with the $D0$ detector*, V. M. Abazov *et al.*, Phys. Rev. D. **89** 012005 (2014). arXiv:1310.8628[hep-ex].
- *A Radiation-Hard Dual Channel 12-bit 40 MS/s Pipeline ADC Prototype with extended Dynamic Range for the ATLAS Liquid Argon Calorimeter Readout Electronics Upgrade at the CERN LHC*, J. Kuppambatti, J. Ban, T. Andeen, P. Kinget, G. Brooijmans, JINST **8** P09008 (2013).

- *Sensitivity to the Single Production of Vector-Like Quarks at an Upgraded Large Hadron Collider*, T. Andeen, C. Bernard, K. Black, T. Childres, L. Dell'Asta, N. Vignaroli, arXiv:1309.1888[hep-ph].
- *Search for excited leptons in proton-proton collisions at $\sqrt{s} = 7$ TeV with the ATLAS detector*, G. Aad *et al.*, Phys. Rev. D. **85** 072003 (2012). arXiv:1201.3293[hep-ex].
- *Measurement of the W boson mass*, V. M. Abazov *et al.*, Phys. Rev. Lett. **103** 141801 (2009). arXiv: 0908.0766[hep-ex].
- *Direct Measurement of the W Boson Width*, V. M. Abazov *et al.*, Phys. Rev. Lett. **103** 231802 (2009). arXiv: 0909.4814[hep-ex].
- *The $D\bar{O}$ experiment's integrated luminosity for Tevatron Run IIa*, T. Andeen *et al.*, FERMILAB-TM-2365 (2007).
- *Online System for Normalizing Data Acquired by the Fermilab $D\bar{O}$ Experiment*, S. Park *et al.*, J. Korean Phys. Soc. **49**, 6 (2006).

Affiliations

- Elected into *Phi Beta Kappa* National Honor Society (2001)
- Member of American Physical Society (1998)
- Member of American Association for the Advancement of Science (2008)