William K. DiClemente, PhD

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EDUCATION

University of Pennsylvania, Philadelphia, PA
PhD, Experimental Particle Physics, May 2019
Masters of Science, Physics, May 2015

Duke University, Durham, NC
Bachelor of Science, Physics (High Distinction), May 2013
Minors, Mathematics, May 2013

TECHNICAL SKILLS

Proficient in C++, Python/Matplotlib, ROOT/PyROOT (Physics data analyis framework)
Experienced in Unix-based OS, LaTeX, SQL, Bash, Git, Java

RESEARCH EXPERIENCE

Particle Physics Research with the ATLAS Experiment at CERN
University of Pennsylvania (2014-2019)/Duke University (2010-2013)

As a physics researcher, I used a combination of C++ and Python software including ROOT, experiment-wide frameworks, and personal analysis-specific software to read, analyze, and visualize terabytes of real and simulated ATLAS data. My research was highly collaborative; our analysis teams would regularly report progress with parent groups, interact with experts on detector performance, and consult with theorists for additional ideas and models to test.

Research highlights include:

- Played a leading role in the development of an updated technique for modeling troublesome background processes in a high-profile physics analysis.
- Slimmed and skimmed many-terabyte datasets into smaller, analysis-specific samples for several different analyses.
- Optimized an analysis's signal selection using a random grid search algorithm, improving the significance by nearly 60%.
- Introduced a new set of 2D cuts to an analysis which reduced a major background by 20%.
- Monitored detector performance for possible biases in data reconstruction using 2D maps built from fits to distributions of various measured quantities.
- Analysis work resulted in 4 papers, as well as being a contributing author on over 100 additional ATLAS publications.

TEACHING EXPERIENCE

Introductory Physics Laboratory Teaching Assistant
University of Pennsylvania (2013-2014)

Responsibilities included demonstrating lab techniques and guiding students through their exercises. In the event that the lab material was not covered in lecture, I was responsible for teaching the necessary topics so the students could complete the assignments.

CONFERENCE PRESENTATIONS

Measurement of same-sign WW diboson production at 13 *TeV with the ATLAS detector.* Meeting of the American Physical Society Division of Particles and Fields. Fermi National Accelerator Laboratory, Batavia, Illinois. July 31-August 4, 2017.

Alignment of the ATLAS Inner Detector in the LHC Run II. Poster presentation. XXVII International Symposium on Lepton Photon Interactions at High Energies. Ljubljana Exhibition and Convention Centre, Slovenia. August 17-22, 2015.

Searches for New Physics Using $W\gamma$ Production at the LHC. American Physical Society April Meeting. Denver, Colorado. April 14, 2013.

Search for Quartic Couplings in the $p + p \to W(\mu\nu) + \gamma\gamma$ Channel. Poster presentation. US ATLAS Annual Physics Workshop. University of Michigan, Ann Arbor, Michigan. August 14, 2012.