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, ROOT/PyROOT (Data analyis framework)
Experienced with Unix-based OS, LaTeX, MySQL, 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 ROOT, experiment-wide frameworks, and personal analysis-specific software written in C++ and Python to read, analyze, and visualize terabytes of ATLAS data, both real and simulated. My research was highly collaborative; our analysis teams would regularly report progress with parent groups, as well as interact with experts on detector performance and 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 large data sets (several TB) into smaller, analysis-specific samples for several different analyses.
- Optimized one 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 (2014-2015)

Taught three semesters of classical mechanics and electricity and magnetism labs. Responsibilities included lab demos and guidance, teaching necessary content if not covered in lecture, and lab report grading.