William K. DiClemente

CONTACT INFORMATION
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CURRENT ADDRESS
3200 Summer St. Unit 5
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EDUCATION

University of Pennsylvania, Philadelphia, PA
Doctor of Philosophy, Physics (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: C++, Python, ROOT/PyROOT (Data analyis framework)
Familiar: Unix-based OS, LaTeX, Git, Java, MySQL

RESEARCH EXPERIENCE

***W* Boson Analysis and Detector Alignment with the CERN ATLAS Experiment**
University of Pennsylvania (2014-2019)/Duke University (2010-2013)
Particle Physics Researcher

ATLAS's first observation of same-sign W boson scattering using 2015-2016 data:

- Modified existing method for modeling background contribution from fake leptons by including more measured quantities in order to achieve better data-simulation agreement
- Developed new method using 2D cuts targeting 3-lepton backgrounds, reducing them by up to 20% in some tests

Prospects for same-sign W boson scattering at future HL-LHC collider:

- Increased signal significance by nearly 60% by optimizing selection using a random grid search algorithm
- Corrected overprediction of top quark backgrounds by implementing an analogue for a particle isolation requirement missing from the simulation

Alignment of the ATLAS Inner Detector:

- Corrected misaligned sensors by applying corrections derived using a global χ^2 minimization of track-hit residuals from millions of particle tracks
- Measured and corrected momentum biases in the detector using 2D maps created from fits of electron energy and momentum distributions

SELECTED PUBLICATIONS

DiClemente, William K., *Measurement of Electroweak Production of Same-Sign W Boson Pairs with ATLAS*. PhD thesis. `http://cds.cern.ch/record/2674035`. Presented 21 Feb, 2019.

ATLAS Collaboration, *Observation of electroweak production of a same-sign WW boson pair in association with two jets in pp collisions at* $\sqrt{s} = 13$ *TeV with the ATLAS detector*. Submitted to Phys. Rev. Lett. June 2019. `arXiv`:1906.03203 [hep-ex].