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Education

Harvard University, Massachusetts, MA

Ph.D., Physics, expected May 2017

M.A., Physics, 2014

Committee: Profs. Melissa Franklin (Adviser), Masahiro Morii, Howard Georgi

California Institute of Technology, California, CA

B.A. with honors, Physics, 2012

Research Interests

Searches for new physics models with the Higgs Boson

Di-boson production and measurement at TeV scale

Charged particle prompt reconstruction

Detector operation, monitoring and upgrade development

Research Experience

Harvard University

Analyzer, $X \rightarrow$ boosted $hh \rightarrow b\bar{b}b\bar{b}$ using ATLAS 13TeV data	2015-2016
Developer, Improvement of Segment Seeding in Muon Reconstruction	2015-2016
Co-developer, Offline Data Quality Software for Muon Reconstruction	2015-2016
Expert and organizer, Offline Muon Data Quality Monitoring	2015
Analyzer, Prospective study of $hh \rightarrow WW\tau\tau$ for High Lumi LHC	2014
Calibration of Prototype Micromegas Chambers at Harvard	2014
Study of Muon Segments in ATLAS detector using 8TeV data	2012-2013

California Institute of Technology

Study of Vector Boson + Jets using CMS 8TeV data	2011-2012
Design and validation of an optical sensor for telescopes	2009-2010
Design experiment and study of market convergence	2009-2010
Modeling on novel methods of space launching	2008-2009

Detailed Research Contributions

Analysis

$X \rightarrow$ **boosted $hh \rightarrow b\bar{b}b\bar{b}$ using ATLAS 13TeV data**

- Devised signal regions, improved search sensitivities
- Revised data-driven background estimation methods
- Validated signal MC simulations
- Updated software framework, produced analysis NTuples
- Selected and validated analysis trigger, optimized event selection
- Evaluated systematics for detector responses and data-driven methods
- Calculated asymptotic exclusion limits
- Drafted supporting documents, produced event displays

Prospective study of $hh \rightarrow WW\tau\tau$ for High Lumi LHC

- Designed signal regions and event selections
- Tested multivariate analysis methods and increased signal sensitivities
- Predicted cut-based and multivariate analysis combined significances

Hardware

Prototype Micromegas Tests

- Calibrated charge and timing of prototype chambers
- Assisted cosmic muon data taking
- Analyzed and measured cosmic muon charge and timing distributions

Software

Muon Reconstruction

- Created parabolic road extrapolation for raw Muon detector hits selection
- Resolved previous bugs in road extrapolation

Muon Monitoring

- Developed, updated and maintained Muon Performance Monitoring packages
- Designed and maintained offline Muon Performance Monitoring Displays
- Improved and maintained offline Muon Detector and Performance Monitoring Algorithms
- Maintained Muon Performance Monitoring packages for prompt online Monitoring

Operation

Muon Data Quality

- Organized weekly meetings on offline software updates and data quality status
- Coordinated offline Muon Detector Monitoring software updates
- Created offline shifter training materials and instructions
- Created webpages for offline shifter records
- Communicated between online and performance experts

Shifts

- Participated online ATLAS Control Room Shifts: Muon Desk, Data Quality Desk
- Participated offline Muon Data Quality Shifts: sign-offs
- Participated offline Expert Shifts: assisted the shifters for offline Muon Data Quality

Publications and Talks (with links)

Paper

[Search for pair production of Higgs bosons in the \$b\bar{b}b\bar{b}\$ final state](#) 2016

Public Notes

[ATLAS-CONF-2016-049](#), $hh \rightarrow 4b$ 2016 summer

[ATLAS-CONF-2016-017](#), $hh \rightarrow 4b$ 2016 spring

Public Talks

[ATLAS \$hh \rightarrow 4b\$ ICHEP Results](#), Higgs Boson and BSM, Weihai, China 2016

Selected ATLAS Talks

[\$hh \rightarrow 4b\$, analysis ICHEP ATLAS Approval](#) 2016

[\$hh \rightarrow 4b\$, analysis ICHEP Exotics Approval](#) 2016

[\$hh \rightarrow 4b/bb\tau\tau/bbWW\$, Exotics Workshop, Grenoble](#) 2016

[Muon Segment Seeding](#), Muon Week, Software 2016

[Muon Hough Transform Tuning](#), Muon Week, Software 2015

[Muon Spectrometer and DQ Status](#), ATLAS Weekly 2015

[Muon DQ 2015 Summary](#), Muon Week, Operations 2015

[Muon DQ Pre Run II Status](#), Muon Week, Operations 2015

[Muon DQ Shifter Manual](#) 2015

Teaching Experience

Physics Department, Harvard University

Guided undergraduate student Gray Putnam's summer research 2016

Guided undergraduate student Michael Albergo's summer research 2015

Teaching Fellow, Physics 125, Widely Applied Physics, Qscore 4.33/5 2014

Teaching Fellow, Physics 16, Classical Mechanics and Relativity, Qscore 4.47/5 2013

Physics Department, California Institute of Technology

Teaching Assistant, Physics 50, Physics League 2011-2012

Honors

Harvard White Teaching Prize for Physics 16 2014

Harvard Traveling Scholar 2015-2016

Caltech Undergrad Summer Research Fellowship 2009-2012

Languages and Skills

Chinese (native), English (proficient), French (elementary)

C++, HTML, \LaTeX , Matlab, Mathematica, Python, ROOT

References

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