Tao Peng

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Personal Information

Full Name: Tao Peng   Gender: Male   Date of Birth: May 4th, 1987

Career Interests

Quantitative analysis.

Highlights

1. C++ programming skills.
2. Mathematical skills, like partial differential equations, probability and statistics, complex variable functions, and tensor analysis.
3. Prepared for the CFA level 1 test in 2014 summer, completed 2/5 of the *SchweserNotes for the CFA Exam*. By preparing for the test, I gained some basic financial knowledge like microeconomic analysis, macroeconomic analysis, economics in a global context; quantitative methods like the time value of money, discounted cash flow applications; and ethical and professional standards of financial analyst.

Education

University of Wisconsin-Madison   2012 - Now
Ph.D.: Theoretical Particle Physics

Peking University (Ranked 1st in China, 2014)   2009 - 2012
Master of Science: Theoretical Particle Physics

Huazhong University of Science and Technology (Ranked 11st in China, 2014)   2005 - 2009
Bachelor of Science: Applied Physics

Publications

1. Tao Peng and Bo-Qiang Ma, Physical Review D 84, 034003 (2011), *Tetramixing of vector and pseudoscalar mesons: A source of intrinsic quarks.*
2. Tao Peng and Bo-Qiang Ma, European Physical Journal A 48, 66 (2012), *Heavy quarkonium 2S stats in light-front quark model.*
3. Three other projects have been completed, and currently writing papers for them. One of them will be submitted to Physical Review Letters, the best journal in physics.

Research Experience

1. Lepton number violation simulation, with M. Ramsey-Musolf and P. Winslow, in UW-Madison.
   Generated Monte Carlo simulations for events with lepton number violation at the Large Hadron Collider (LHC). Developed C++ codes to analyse the events. Calculated one loop corrections to the operators analytically. We found that it is very realistic for LHC to search for the signal of lepton number violation with the luminosity in near future. This project has been completed and we are now writing a paper for Physical Review Letters.

2. The supersymmetry simulation, with M. Ramsey-Musolf, in UW-Madison.
   Generated Monte Carlo simulations for events in a supersymmetry model at the Large Hadron Collider (LHC). Developed C++ codes to analyse the events. In the codes, I developed an algorithm to list all the ways to divide any number of jets (outgoing objects in colliders) into all possible two pseudojets (subgroup of jets). The hard part of this algorithm is that the total number of jets (n) is variable. This project has been almost completed, and we are about to write a paper and submit to Physical Review D.

3. The dark photon simulation, with M. Ramsey-Musolf and C. Delgado, in UW-Madison.
   Wrote a model file (in Mathematica syntax) of a dark photon model. Will use this model file to generate events and Build C++ codes to analyse it, in the purpose of looking for positive signatures of this model at LHC. This project is currently ongoing.

4. Dark matter operator mixing and corrections, with M. Ramsey-Musolf and G. Ovanesyan.
   Calculated one loop QCD and electroweak corrections to dark matter operators analytically, and studied the mixing and running of these operators. The mixing and running have detectable effect on dark matter detections. This project has been completed, and a paper has been completed and ready to be submitted to Physical Review D.

5. Four-mixing of mesons, with Prof. B.-Q. Ma, in Peking University
   Postulated a four-mixing formalism of mesons, using the light-front field theory. It offers an alternative explanation to the CLEO experimental data of J/ψ decay. Used FORTRAN and Matlab to do numerical fitting and calculations. It is published as Phy. Rev. D 84, 034003 (2011).

6. Heavy quarkonium 2S states, with Prof. B.-Q. Ma, in Peking University
   Investigated the heavy quarkonium 2S states, the results could well explain the experimental data of *BES-III* collaboration about the decay of 2S quarkonia. Used FORTRAN and Matlab to do numerical calculations. It is published as Eur. Phys. J. A 48, 66 (2012).

Awards and Scholarship
1. Teaching Assistant and Research Assistant in UW-Madison, ~$24,000 per year, Sept 2012 – now.
2. Founder Scholarship of Peking University, RMB 5000 yuan, < 1 percent, Oct 2011.
3. Second Level Scholarship of Peking University, RMB 13600 yuan each year, Sept 2009 – June 2012.
4. Three-good Student of the Theoretical Physics Master class, < 10 percent, Nov 2011.
5. Award for excellent academic performance in class at HUST, RMB 800 yuan, < 10 percent, Dec 2007.

Working as Teaching Assistant
1. Physics 322 (Electrodynamics), Fall 2014, UW-Madison. teach discussions and grade.
2. Physics 202 (Electromagnetism), Spring 2014, UW-Madison. teach discussions and labs, and grade.
3. Physics 202 (Electromagnetism), Fall 2013, UW-Madison. teach discussions and labs, and grade.
4. Physics 202 (Electromagnetism), Spring 2013, UW-Madison. teach discussions and labs, and grade.
5. Physics 202 (Electromagnetism), Fall 2012, UW-Madison. teach discussions and labs, and grade.
6. Theoretical Mechanics, Fall 2011, Peking University, teach discussions and grade.
7. Classical Electrodynamics, Spring 2011, Peking University, teach discussions and grade.