Wei Zhuang (Armstrong) Peng

weizhuang.peng@vanderbilt.edu
2201 West End Ave, Nashville, TN 37235
615-839-2158

EDUCATION

Doctor of Philosophy (Ph.D.) in Physics
Vanderbilt University, Nashville, TN 2014-Present
Specialization: Heavy Ion Experimental Physics

Bachelor of Science (B.S.) in Theory Physics
Harbin Institute of Technology, Harbin, China 2010-2014

RELEVANT COURSES

Coursera: Machine Learning, Deep Learning, Algorithms, Python for Everybody, Statistics
Udemy: SQL, R Programing

COMPUTER LANGUAGES

Python, R, C++, MATLAB, Java, SQL, Tensorflow

Projects

- Implemented a deep CNN model using ResNets and applied to image classification problem using pre-trained parameters and achieved 87 percent accuracy
- Built a car detection algorithm using the YOLO model and loaded some pre-trained parameters to run on some test image, successfully detected all the cars on the test image
- Built a simple Neural Machine Translation model to translate human readable dates into machine readable dates, worked well on many kinds of input data

TEACHING EXPERIENCE

Electricity, Magnetism and Electrodynamics I *(Dr. Paul Sheldon)* Spring 2017
Stars and Galaxies *(Dr. Keivan Stassun)* Spring 2016
General Physics I *(Dr. Momchil Velkovsky)* Spring 2016
Classical Mechanics *(Dr. Charles Maguire)* Fall 2014

RESEARCH EXPERIENCE

Research Assistant Sep. 2014 - Present
Physics Department, Vanderbilt University, Nashville, TN
Research Advisor: Professor Julia Velkovska
Project Summary:

- Identified particle spectra for *RHIC Run15 pAu* dataset
- Removed background tracks by projecting the track to another detector and compare the residuals on that detector
- Ran particle *Monte Carlo* simulations to obtain the efficiency of the detector
- Applied the efficiency of the raw spectra to get the invariant yield particle production for pions and protons

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CONFERENCE PARTICIPATION

- The 34th Winter Workshop on Nuclear Dynamics (Deshaies, Guadeloupe) Mar. 2018
  - Workshop Presentation: ***PHENIX Results on Collectivity in Small Systems***
- Fall Meeting of the Division of Nuclear Physics of the American Physical Society (Pittsburgh, PA) Oct. 2017
  - Workshop Presentation: ***PHENIX Results on Identified Particles Spectra and Anisotropic Flow in p/d/^{3}He+Au collisions at 200 GeV***
- Quark Matter (Chicago, IL) Feb. 2017
  - Poster Presentation: ***Identified Particle Anisotropic Flow in p/d/^{3}He+Au Collisions at 200 GeV***

PUBLICATION

Measurements of Mass-Dependent Azimuthal Anisotropy in Central P+Au, D+Au and 3He+Au Collisions at Sqrt(sNN) = 200 GeV, Phys. Rev. C 97, 064904

We present measurements of the transverse-momentum dependence of elliptic flow v2 for identified pions and (anti)protons at midrapidity (|η|<0.35), in 0%--5% central p+Au and 3He+Au collisions at Sqrt(sNN) 200 GeV. When taken together with previously published measurements in d+Au collisions at Sqrt(sNN) 200 GeV, the results cover a broad range of small-collision-system multiplicities and intrinsic initial geometries. We observe a clear mass-dependent splitting of v2(pT) in d+Au and 3He+Au collisions, just as in large nucleus-nucleus (A+A) collisions, and a smaller splitting in p+Au collisions. Both hydrodynamic and transport model calculations successfully describe the data at low pT (<1.5 GeV/c), but fail to describe various features at higher pT. In all systems, the v2 values follow an approximate quark-number scaling as a function of the hadron transverse kinetic energy per constituent quark(KET/nq), which was also seen previously in A+A collisions.
Link : https://journals.aps.org/prc/pdf/10.1103/PhysRevC.97.064904

PHENIX Results on Collectivity in Small Systems, J. Phys.: Conf. Ser. 1070 012010

Recent results from small collision systems at RHIC and LHC indicate that many of the signatures of collective behavior observed in AA collisions are also present in small systems in high-multiplicity events. Using the extraordinary versatility of RHIC in selecting different colliding species, the PHENIX experiment has collected data in p+Al, p+Au, d+Au, and 3He+Au at a nucleon-nucleon center-of-mass energy of 200 GeV and conducted a comprehensive set of anisotropic flow measurements. These geometry-controlled experiments provide a unique testing ground for theoretical models that produce azimuthal particle correlations based on initial and/or final state effects. In this paper, we present measurements of elliptic and triangular flow for inclusive charged particles, and v2(pT) measurements for identified pions, and protons. Detailed model comparisons and the implications for the origin of collectivity in p/d/ 3He+Au collisions are discussed.
Link : https://iopscience.iop.org/article/10.1088/1742-6596/1070/1/012010/pdf