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The 145th HENPIC seminar by Prof. Fuqiang Wang 王福强 (Purdue U. & Huzhou U.), August 12, 2021, Thursday, 10:30 am (UTC+8)

Talk title: Experimental Status of the Chiral Magnetic Effect

Speaker: Prof. Fuqiang Wang, Purdue U. & Huzhou U.

Abstract:
The chiral magnetic effect (CME) has excited immense interest because of its fundamental physics of topological gluon field in QCD and possible connection to the matter-antimatter asymmetry of the universe. It refers to a charge separation arising from the chiral anomaly under the influence of a strong magnetic field. Experimental measurements of CME-sensitive charge separation observables in heavy ion collisions are overwhelmed by physics backgrounds. The experimental challenge has become how to control/calibrate the backgrounds in order to extract the possible small CME signal. In this seminar, I will first give a brief introduction of the CME and the background issue in its experimental search with a limited survey of the experimental observables. I will then focus on the most recent measurement from STAR utilizing the spectator and participant planes in Au+Au collisions [1], especially regarding possible additional backgrounds [2]. Finally I will discuss some trivial effects pertinent to the isobar collisions [3], and outlook the prospects of future Au+Au data taking at RHIC.

[1] STAR Collaboration, "Search for the chiral magnetic effect via charge-dependent azimuthal correlations relative to spectator and participant planes in Au+Au collisions at 200 GeV", arXiv:2106.09243 [nucl-ex].
[2] Yicheng Feng et al., "Two- and three-particle nonflow contributions to the chiral magnetic effect measurement by spectator and participant planes in relativistic heavy ion collisions", arXiv:2106.15595 [nucl-ex].
[3] Yicheng Feng et al., "Revisit the Chiral Magnetic Effect Expectation in Isobaric Collisions at the Relativistic Heavy Ion Collider", arXiv:2103.10378 [nucl-ex], Phys. Lett. B 820 (2021) 136549.

About the speaker:
Fuqiang Wang is a professor of physics at Purdue University and Huzhou University. He is a high energy nuclear experimentalist, and a member of the RHIC-STAR, CERN-CMS, and NICA-MPD Collaborations. He worked on many areas of research in heavy ion physics; his latest interest is in experimental search for the chiral magnetic effect predicted by quantum chromodynamics. He received his Ph.D. from Columbia University in 1996 with work on heavy ion experiments at BNL, and worked as a postdoctoral fellow at LBNL before joining the Purdue faculty.

Presenter: Prof. WANG, Fuqiang