

The 141st HENPIC seminar by Baochi Fu 付宝迟 (Peking University), June 2, 2021, Wednesday, 10:30 am (UTC+8)

Talk title: Global and local spin polarization in heavy-ion collisions

Speaker: Baochi Fu, Peking University

Abstract:

In non-central heavy-ion collisions, the produced quark-gluon plasma (QGP) carries a large amount of orbital angular momentum, which couples with the spin of constituent particles and finally induce spin polarization of emitted hyperons. The observed Lambda spin polarization at RHIC and LHC experiments provides new insights into the properties of hot and dense QCD matter. Theoretically, one widely studied effect is the spin polarization induced by thermal vorticity. Such calculation successfully predicts the global polarization in experiments but fails to describe its azimuthal angle dependence.

In this talk, I will firstly review the hydrodynamic/transport model calculation based on thermal vorticity and then focus on the local polarization puzzle. In addition to thermal vorticity effects, recently we identify an undiscovered contribution from shear stress tensor, which can be obtained by quantum kinetics and linear response theory. By using realistic hydrodynamic calculations, we find the shear contribution always shows the same azimuthal angle dependence as observed in experiments and competes with thermal vorticity effects. In the scenario that Lambda inherits and memorizes the spin polarization of strange quark, shear contribution wins the competition and the local polarization agrees qualitatively with the experiment measurements.

About the speaker:

Baochi Fu, currently a Ph.D. candidate in Peking University supervised by Prof. Huichao Song. His research focuses on collective flow and spin polarization in relativistic heavy-ion collisions.

Presenter: Mr FU, Baochi