Abstract Submitted
for the DNP20 Meeting of
The American Physical Society

Event-by-event correlations between $\Lambda/\bar{\Lambda}$ polarization and CME observables in Au+Au collisions at $\sqrt{s_{NN}} = 27$ GeV from STAR[1] YICHENG FENG, Purdue Univ, STAR COLLABORATION — Spin-orbit interactions cause a global polarization of $\Lambda/\bar{\Lambda}$ with the vorticity (total angular momentum) in the participant collision zone. The strong magnetic field mainly created by the spectator protons were predicted to lead to difference in the Λ and $\bar{\Lambda}$ global polarization ($\Delta P = P_\Lambda - P_{\bar{\Lambda}} < 0$). On the other hand, the QCD predicts topological charge fluctuation in vacuum, resulting in a chirality imbalance, or parity violation in a local domain. This would give rise to an imbalanced left- and right-handed $\Lambda/\bar{\Lambda}$, $\Delta N = N_L - N_R \neq 0$, and a charge separation along the magnetic field, chiral magnetic effect (CME). The latter is characterized by the parity-even γ-correlator $\Delta\gamma$ and parity-odd sine coefficient a_1. While measurements of individual ΔP, $\Delta\gamma$, and a_1 have not led to affirmative conclusions on the CME or the magnetic field, correlations among these observables may reveal new insights. We report exploratory measurements of event-by-event correlations between ΔP and $\Delta\gamma$, and between ΔN and a_1, by the STAR experiment in Au+Au collision at 27 GeV.

[1]for the STAR collaboration

Yicheng Feng
Purdue Univ

Date submitted: 24 Jun 2020 Electronic form version 1.4