

Global spin alignment of ρ^0 meson in Au+Au and Isobar (Zr+Zr and Ru+Ru) collisions at 200 GeV

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The search for the Chiral Magnetic Effect (CME) is ongoing in relativistic heavy-ion experiments. It is crucial to scrutinize the CME-sensitive observables to rule out non-CME contributions. Recently STAR has measured an unexpectedly large signal of global spin alignment (ρ_{00}) for ϕ meson, which is argued to be sensitive to the local fluctuations of the vector meson strong force field[1]. A finite ρ_{00} of vector mesons can influence CME-sensitive observables. In particular, the ρ_{00} of ρ^0 mesons can induce a positive (negative) contribution to the CME observables, depending on the deviation of ρ_{00} being larger (smaller) than 1/3 [2,3]. In this talk, we will present measurements of the global spin alignment for ρ^0 meson as functions of transverse momentum and centrality in Au+Au and Isobar (Zr+Zr and Ru+Ru) collisions at $\sqrt{s_{NN}} = 200$ GeV. We will discuss the implications of our results in the context of interpreting CME observables.

[1] M. S. Abdallah et al. (STAR Collaboration), Nature 614, 244 (2023).

[2] A. Tang, Chin. Phys. C 44, 054101 (2020).

[3] D. Shen, J. Chen, A. Tang, G. Wang, Phys. Lett. B 839, 137777 (2023).