

Differential measurement of global polarization of Λ hyperons at RHIC-STAR experiment

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In non-central heavy-ion collisions, large orbital angular momentum can be manifested in the form of vorticity in the medium. Due to the spin-orbit coupling, the spin directions of particles are aligned with the orbital angular momentum of the system. Global spin polarization of Λ and $\bar{\Lambda}$ hyperons has been measured in Au+Au collisions from $\sqrt{s_{\text{NN}}} = 3.0$ GeV to 5.02 TeV and it is found that global polarization increases at lower collision energies [1–4]. The slope of the directed flow at mid-rapidity is likely to have strong correlation with the vorticity, and there is a similar trend on the energy dependence between global polarization and the slope of the directed flow [5]. In this talk, we will report differential measurements (transverse momentum, centrality, and first order flow vector (q_1) dependence) of global spin polarization of Λ hyperons in Au+Au collisions at $\sqrt{s_{\text{NN}}} = 54.4$ GeV.

References

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