

Measurements of Global and Local Polarization of Hyperons in 200 GeV Isobar Collisions from STAR

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In heavy-ion collisions, the observation of the global and local polarization of hyperons has revealed the existence of large vorticities perpendicular to reaction plane due to systems's orbital angular momentum and along beam direction due to collective velocity field, respectively. With the high-statistics data from isobar collisions of Ru+Ru and Zr+Zr at $\sqrt{s_{NN}} = 200$ GeV collected by the STAR experiment, we present differential measurements of global polarization for Λ , $\bar{\Lambda}$ and Ξ^\pm as a function of centrality, p_T , η and azimuthal angle relative to the event plane. These measurements allow us to study possible magnetic field driven effects through the polarization difference between Ru+Ru and Zr+Zr, owing to a larger magnetic field in the former. Furthermore, the first measurements of Λ hyperon local polarization along the beam direction relative to the third order event plane as well as the second order event plane will be presented[1]. Comparisons with previous measurements at RHIC and the LHC provides important new insights into the collision system size or energy dependence of the vorticities in heavy-ion collisions.

References

- [1] STAR Collaboration, Hyperon polarization along the beam direction relative to the second and third harmonic event planes in isobar collisions at $\sqrt{s_{NN}} = 200$ GeV, arXiv:2303.09074.