

Λ Hyperon Polarization in Non-central Heavy-ion Collisions

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In non-central heavy-ion collisions, the system's global angular momentum and local vorticity can induce particle polarization. In particular, polarization along the beam direction may arise from asymmetries in the transverse velocity fields associated with elliptic flow.

In this study, we investigate the polarization of Λ and anti- Λ hyperons using ALICE Run 2 and Run 3 data. Since the polarization of Λ hyperons cannot be measured directly, it is inferred from the angular distributions of protons and pions produced in their parity-violating weak decays. We present measurements of both the local polarization along the beam direction, as a function of the emission angle relative to the reaction plane, and the global polarization with respect to the system's initial angular momentum.

These results, in comparison with the latest theoretical developments, provide new insights into the spin dynamics of strongly interacting matter.

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