

# Centrality Dependence of Global and Azimuthal of $\Lambda$ Hyperon Polarization In heavy-ion collisions

*Monday 7 April 2025 16:00 (15 minutes)*

Using a (3+1)D hydrodynamic model, we analyze  $\Lambda$  hyperon polarization in heavy-ion collisions at  $\sqrt{s_{NN}} = 200$  GeV, revealing a strong dependence on initial conditions and QGP viscosity. The model accurately reproduces hadronic flow observables and predicts higher-order azimuthal oscillations in longitudinal polarization. Novel correlations between polarization and anisotropic flow are proposed, offering new experimental tests. A system-size study confirms a dependence consistent with vorticity, providing crucial constraints on quark-gluon plasma dynamics and spin-polarization mechanisms.

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