

Axial anomaly and energy dependence of hyperon polarization in Heavy-Ion Collisions

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We address the issue of energy and charge dependence of global polarization of Λ hyperons in peripheral Au–Au collisions recently observed by the BES STAR collaboration at RHIC. We compare different contributions to the anomalous mechanism relating polarization to vorticity and hydrodynamic helicity in QCD matter. We stress that the suppression of the gravitational anomaly contribution in strongly correlated matter observed in lattice simulations confirms our earlier prediction of rapid decrease of polarization with increasing collision energy. Our mechanism leads to polarization of anti- Λ of the same sign and larger magnitude than the polarization of Λ . Polarization calculated in the kinetic QGSM model has a maximum at the NICA and FAIR energy range. The energy and charge dependence of polarization is suggested as a sensitive probe of fine details of QCD matter structure.

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