

Global polarization effect in relativistic heavy ion collisions

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Parity non-conservation provides a practical way to measure hyperon polarizations in high energy reaction experiments and leads to the discovery of significant transverse polarization of hyperons in unpolarized hadron-hadron collisions and a series of other unexpected spin effects. These striking spin effects lead to an active direction in QCD –the QCD spin physics.

Global polarization of the quark gluon plasma (QGP) in relativistic heavy ion collisions has been proposed twenty years ago. It has been shown that the colliding system in non-central relativistic heavy ion collision possess a huge orbital angular momentum in the direction opposite to the normal of the reaction plan. Due to QCD spin orbit interaction such huge orbital angular momentum can be transferred partly to the spin polarization of QGP produced in the collision and leads to global polarization of QGP. The effect has been confirmed by experiments worldwide. It opens a new avenue in studying QGP properties in heavy ion collisions and QCD theory thus leads to a novel direction in QCD spin physics. This talk will briefly summarize the basic ideas and results of the global polarization and discuss recent developments and outlook.

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