

Global spin polarization of Λ and $\bar{\Lambda}$ hyperons in Au+Au collisions at RHIC-STAR

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In non-central heavy-ion collisions, large angular momentum is generated, leading to significant vorticity and subsequent spin polarization of particles with finite spin. The global polarization of Λ and $\bar{\Lambda}$ hyperons (P_Λ and $P_{\bar{\Lambda}}$), measured along the direction of global angular momentum, serves as an effective probe of both vorticity and spin degrees of freedom. P_Λ has been measured over a wide range of collision energies. The data from Beam Energy Scan II (BES-II) program at RHIC, including the collider and recent Fixed-Target (FXT), have provided a unique opportunity to study spin degrees of freedom in a wide region of baryon density. In this energy range, P_Λ is observed to be sensitive to the equation of state of the nuclear medium.

In this talk, we will present measurements of global Λ polarization in Au+Au collisions at $\sqrt{s_{NN}} = 3.0, 3.2, 3.5, 3.9, 4.5, 5.2,$ and 6.2 GeV, along with global Λ and $\bar{\Lambda}$ polarization and their differences in Au+Au collisions at $\sqrt{s_{NN}} = 7.7, 9.2, 11.5, 14.6, 17.3,$ and 19.6 GeV from BES-II. The dependence of the measured global polarization on collision energy, centrality, rapidity, and transverse momentum will be discussed.

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