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Beam Energy Dependence of Directed Flow of pions and Kaons in Au+Au Collisions from STAR

The first harmonic coefficient of the Fourier expansion of the final-state momentum-space azimuthal distribution of produced particles is called directed flow (v_1). It describes the collective sideward motion of emitted particles. v_1 is sensitive to the equation of state of nuclear matter, making it a useful probe for studying the phase transition. Results from the RHIC Beam Energy Scan-I (BES-I) program on directed flow shows that the proton and net-proton slope parameter $\frac{dv_1}{dy}|_{y=0}$ exhibits a minimum between 11.5 and 19.6 GeV. Additionally, the net-proton $\frac{dv_1}{dy}|_{y=0}$ changes sign twice between 7.7 and 39 GeV.

In this poster, we will present measurements of the directed flow of π^+, π^-, K^+, K^- and K_s^0 in Au+Au collisions at $\sqrt{s_{NN}} = 7.7, 9.2, 11.5, 14.6,$ and 19.6 GeV from the RHIC Beam Energy Scan-II (BES-II) program. The rapidity and centrality dependence of v_1 , as well as the energy dependence of the v_1 slope, will be discussed. These results will also be compared with predictions from the ultra-relativistic quantum molecular dynamics (UrQMD) model.

Category

Experiment

Collaboration (if applicable)

STAR

Author: HUANG, Yuqing

Presenter: HUANG, Yuqing

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