

## Directed flow of Identified Particles in Au+Au Collisions at $\sqrt{s_{NN}} = 39, 11.5$ and $7.7$ GeV from the STAR Experiment

Measurements of anisotropic flow in heavy-ion collisions provide insight into the early stage of the system's evolution. Directed flow,  $v_1$ , is imparted especially early. A change of sign in the slope of  $dv_1/dy$  for identified particles, particularly for protons, has been suggested as a possible signal of a first-order phase transition. In this talk, we present the STAR measurements of  $v_1$  for  $\pi^\pm$ ,  $K^\pm$ , protons and antiprotons, as well as for all detected charged particles in Au + Au collisions at  $\sqrt{s_{NN}} = 39, 11.5$  and  $7.7$  GeV as a function of transverse momentum, rapidity and centrality. At  $\sqrt{s_{NN}} = 39$  GeV, all measured  $v_1$  values follow the trend observed at higher RHIC energies. At  $\sqrt{s_{NN}} = 11.5$  and  $7.7$  GeV, the proton  $dv_1/dy$  near midrapidity changes sign between peripheral and central collisions. This behavior is not observed for antiprotons,  $\pi^\pm$  and  $K^\pm$ . Results are compared to available model predictions.

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