

Directed flow of K_S^0 , Λ , $\bar{\Lambda}$ and ϕ mesons in
Au+Au collisions at $\sqrt{s_{NN}} = 17.3$ GeV from STAR
Qiuyu Zheng for the STAR collaboration

The directed flow, v_1 , is the first harmonic coefficient in the Fourier expansion of the final state azimuthal distribution relative to the collision reaction plane. It describes the collective sideward motion of emitted particles. Both hydrodynamic and nuclear transport models indicate that v_1 in the mid-rapidity region is sensitive to the details of the expansion of nuclear matter during the early stages of collision. Based on hydrodynamical with a first-order phase transition calculations, a non-monotonic dependence of v_1 slope with respect to rapidity on the collision energy has been proposed as a signature of a first-order phase transition between hadronic matter and quark-gluon plasma.

In this poster we will present measurements of the directed flow of K_S^0 , Λ , $\bar{\Lambda}$ and ϕ mesons in Au+Au collisions at $\sqrt{s_{NN}} = 17.3$ GeV from the RHIC-STAR experiment. We will discuss the rapidity and centrality dependence of the v_1 measurements. These results will be compared with other collision energies from the STAR Beam Energy Scan program, and insights into the QCD phase structure will be discussed.