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Measurement of Azimuthal Anisotropy of Hadrons in Au+Au Collisions at RHIC

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The aim of the heavy-ion experiments at RHIC is to study the QCD matter at very high temperature and/or at high density by colliding nuclei at ultra-relativistic speeds.
Using the information carried by freely streaming final-state particles as probes, we try to understand the properties of the medium created in these collisions. An extensively studied subject is azimuthal anisotropy or elliptic flow (v_2), the collective anisotropic expansion of the medium, originating from the initial spatial anisotropy of the colliding nucleons, and driven by the strong interaction among particles produced in the collision. Due to low hadronic interaction cross-section and early freeze-out, v_2 of (multi)strange hadrons are considered as a better probe of collectivity from the early stage. On the other hand, due to the large mass, heavy charm quarks can only be produced during initial hard scattering and their thermalization time is expected to be delayed by a factor $m_Q/T \sim 5$ fm/c for charm quark (m_Q is the mass of quarks and T is the medium temperature). Hence, v_2 of charm quark carrying hadrons can be used to measure the degree of thermalization of the QCD medium. \\
In this talk, I will discuss recent v_2 results from the STAR experiment at RHIC. We will present v_2 of light (u,d), strange (s) and charm (c) quark carrying hadrons as a function of transverse momentum in Au+Au collisions at \mbox{$\sqrt{s_{\rm NN}}$ = 200 GeV.} Measurements will be compared with available theoretical models to extract viscous and diffusion coefficient of the produced medium. Energy dependence of light and (multi)strange hadrons v_2 will be shown and its physics implication will be discussed.

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