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Heavy Quark Flow at RHIC

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Measuring the azimuthal anisotropy of particles produced in relativistic heavy ion collisions is a powerful probe for investigating the characteristics of the quark-gluon plasma (QGP), which is the phase in QCD matter of de-confined quarks and gluons. The strength of the elliptic anisotropy (v2) in the momentum phase space is transferred from the geometrical anisotropy of the initial collision region because of the pressure gradient. Thus, the measured v2 reflects the equation of state of the dense matter, possibly the QGP, produced in the collisions. The measurement of heavy quarks (charm and bottom) is an especially good tool for studying QGP since these quarks are generated only early stage of the collision and subsequently propagate through the created matter. One of the most remarkable findings at RHIC is that elliptic flow is observed for heavy quark mesons as well as light quark mesons such as pions. This indicates that the heavy quarks interact with the medium more than it had been expected and heavy quarks are also sensitive to the pressure gradients driving hydrodynamic flow. In these early results, RHIC experiments were not able to distinguish electrons from c and b independently. In order to understand these medium effects in more detail it is important to measure the flow of c and b separately. Since the b has much heavier mass than c has, b should have much less flow if the flows of the heavy quarks are purely produced by hydrodynamic mechanism. Therefore, measuring c and b flow separately enable us to check if there is any mechanism other than hydro to produce the heavy quark anisotropy. With the addition of a new Silicon Vertex Detector that enables the measurement of displaced vertices, it is now possible to have flow measurement for c and b separately at RHIC-PHENIX. We will present the latest results of single electrons from heavy quark decays and the PHENIX measurement of flow for c and b separately.