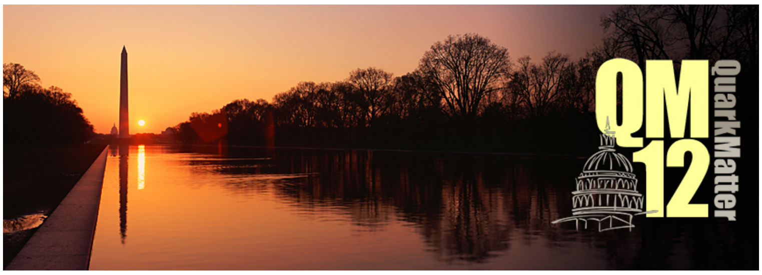

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Two- and Multi-particle cumulant measurements of vn and isolation of flow and nonflow in 200 GeV Au+Au Collisions by STAR

Wednesday, August 15, 2012 9:30 AM (20 minutes)

Azimuthal anisotropic flows vn, arising from the anisotropic collision geometry, reflect the hydrodynamic properties of the quark gluon plasma created in relativistic heavy-ion collisions. A long standing issue in vn measurements is the contamination of nonflow, caused by intrinsic particle correlations unrelated to the collision geometry. Nonflow limits, in part, the precise extraction of the viscosity to entropy density ratio eta/s from data-model comparisons. Isolation of flow and nonflow is critical to the interpretation of the Fourier decomposition of dihadron correlations.

In this talk we report measurements of vn azimuthal anisotropies using the two- and mult-particle Q-cumulants method from STAR in Au+Au collisions at 200 GeV. The centrality and pT dependence of vn will be presented. We compare the four- and six-particle cumulant measurements to gain insights on the nature of flow fluctuations [1,2]. We further analyze two- and four-particle cumulants between pseudo-rapidity (eta) bins. Exploiting the collision symmetry about mid-rapidity, we isolate the \Delta\eta-dependent and \Delta\eta-independent correlations in the data with a data-driven method [3]. The \Delta\eta-dependent part arises from near-side nonflow correlations, such as HBT interferometry, resonance decays, and jet-correlations. The \Delta\eta-independent part is dominated by flow and flow fluctuations with relatively small contribution from away-side jet-correlations. The method does not make assumptions about the eta dependence of flow. Our isolated \Delta\eta-independent part from data, dominated by flow, however, is found to be also eta-independent within the STAR TPC of +-1 unit of pseudo-rapidity. The \Delta\eta drop in the measured two-particle cumulant appears to entirely come from nonflow. We assess the effect of the nonflow on eta/s extraction. We reexamine the high-pT triggered dihadron correlations with background subtraction of our decomposed flows.

[1] S.A. Voloshin, A.M. Poskanzer, A. Tang, and G. Wang, Phys. Lett. B659, 537 (2008).

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[3] L. Xu, L. Yi, D. Kikola, J. Konzer, F. Wang, and W. Xie, arXiv:1204.2815 [nucl-ex].

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