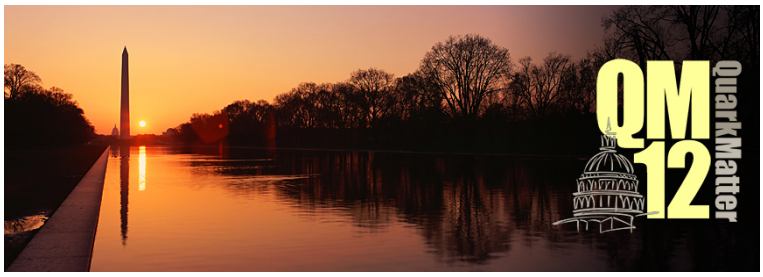

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Two-particle correlations on transverse momentum in Au+Au collisions at $\sqrt{s_{NN}} = 200$ GeV at STAR.

Thursday, 16 August 2012 16:00 (2 hours)

Correlations on transverse momentum p_t include important aspects of the six dimensional correlation space $(p_t 1, \eta_1, \phi_1, p_t 2, \eta_2, \phi_2)$ [1]. Two-particle 2D correlations, $(p_t 1, p_t 2)$, for minimum-bias Au+Au collisions at $\sqrt{s_{NN}} = 200$ GeV from STAR show a broad peak extending from 0.5-4.0 GeV/c [2]. These correlations are formed from all charged particles with $p_t \geq 0.15$ GeV/c, $|\eta| \leq 1$, and 2π azimuth. The broad peak is observed in both like- and unlike-sign charge combinations and same- and away-side relative azimuth angles. Variation of peak positions and widths will be reported as a function of centrality. Interestingly, the peak in the data for away-side or "back-to-back" pairs persists even in more-central collisions, remaining at approximately the same transverse momentum for like- and unlike-sign pairs at all centralities. The event generator HIJING, often used to model peripheral heavy ion interactions, predicts a
similar peak in this momentum range but only when jets are included.
The peak position for same-side unlike-sign pairs remains at the same approximate momentum for peripheral to mid-central collisions.
However, for more-central collisions the same-side peak separates into two peaks. The centrality dependence of these data will be compared with that of p_t-integral 2D angular correlations [3]. The transverse momentum dependence of the same-side angular correlation structures will also be presented. Possible mechanisms for the observed structures will be discussed and predictions from several models will be presented to test agreement with data.

[1] STAR Collaboration, J. Adams, et al., J. Phys. G 34 799 (2007).
[2] L. Ray (2010). Workshop on Critical Examination of RHIC Paradigms [Online]. Available: http://www.rhip.utexas.edu/projects/Star/pa [2012,March 23]
[3] M Daugherity (for the STAR Collaboration), J. Phys. G: Nucl. Part.Phys. 35 104090 (2008).

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