Effects of triangular flow on di-hadron azimuthal correlations in relativistic heavy ion collisions

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We have investigated [1] the di-hadron azimuthal angular correlations triggered by emitted jets for Au+Au collisions at $\sqrt{s}_{NN}$=200 GeV and impact parameter b=8 fm in a multiphase tansport (AMPT) model with string melting [2]. Although the total di-hadron correlations show only a single away-side peak besides a peak at the near side, a double peak structure appears at the away side after the subtraction of the background correlations due to the hadron elliptic flow as shown in the left window of Fig. 1. We have found that both the near-side peak and away-side double peaks in the di-hadron correlations are sensitive to the hadron triangular flow as they are enhanced (suppressed) when we only consider events of large (small) hadron triangular flow. Moreover, the away-side double peaks change into a single peak with braod shoulders on both sides after the subtraction of background correlations due to both hadron elliptic and triangular flows as shown in the right window of Fig. 1. After further subtracting background correlations due to anisotropic flow up to the 5th order, the away side of the di-hadron correlations becomes essentially a single peak. Although other effects, such as jet deflections and Mach cone shock waves [3], on di-hadron correlations are appreciable in central collisions, our study indicates that the away-side double peaks may be dominated by the triangular flow in mid-central collisions.

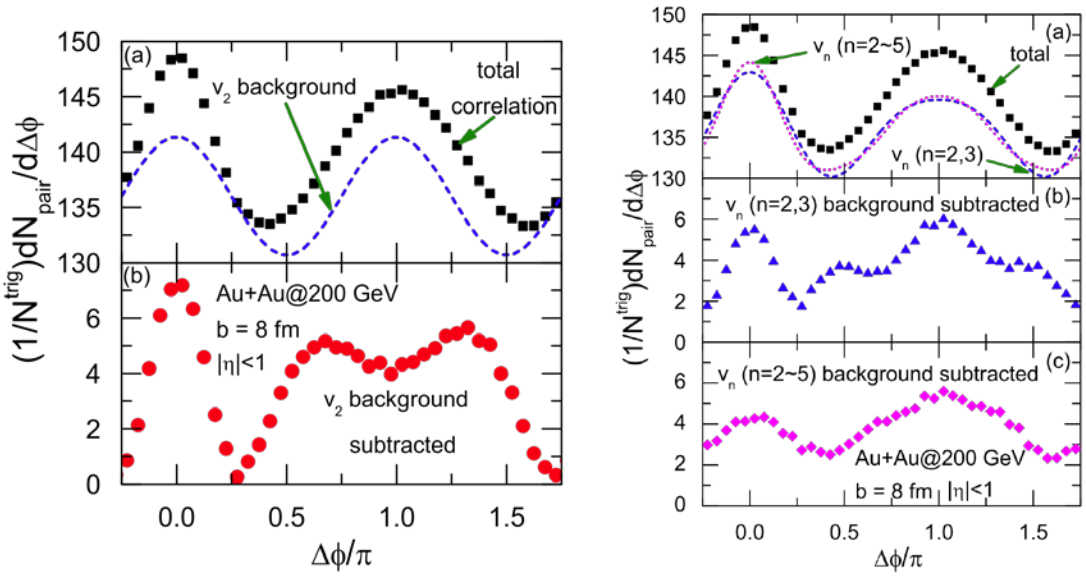

FIG. 1. Left window: Di-hadron azimuthal angular correlations per trigger particle before (panel (a)) and after (panel (b)) subtracting background correlations due to the hadron elliptic flow shown by the dashed line in panel (a). Right window: Same as left window before (panel (a)) and after subtracting background correlations due to both hadron elliptic and triangular flows (panel (b)) shown by the dashed line in panel (a) and due to anisotropic flows up to the 5th order (panel (c)) shown by the dotted line in panel (a).

[1] J. Xu and C.M. Ko, Phys. Rev. C **83**, 021903(R) (2011).

[2] Z.W. Lin, C.M. Ko, B.A. Li, B. Zhang, and S. Pal, Phys. Rev. C **72**, 064901 (2005).

[3] G.L. Ma and X.N. Wang, Phys. Rev. Lett. **106**, 162301 (2011).