Higher-order flows and dihadron correlations in heavy ion collisions at LHC

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We have studied higher-order anisotropic flows and dihadron correlations in Pb-Pb collisions at $\sqrt{s_{NN}}$ = 2.76 TeV within a multiphase transport model [1] with parameters fitted to reproduce the measured multiplicity density of mid-pseudorapidity charged particles in central collisions and their elliptic flow in midcentral collisions in a previous work [2]. We have found that the resulting higher-order anisotropic flows slightly overestimate the experimental data [3] at small centralities, but are consistent with them at other centralities as shown in the left window of Fig. 1. For the dihadron correlations, we have obtained a ridge structure along the pseudorapidity direction in the near side as shown in the right window of Fig. 1, and it disappears when final-state interactions are turned off in our model. We have also studied both the short-range and long-range dihadron azimuthal correlations for different transverse momenta of trigger particles, and they are seen to be qualitatively consistent with experimental results. We have further attempted to determine the background-subtracted short-range dihadron azimuthal correlations by taking the long-range dihadron azimuthal correlations as the background, and they are found to be similar to those obtained previously using a different method [4].

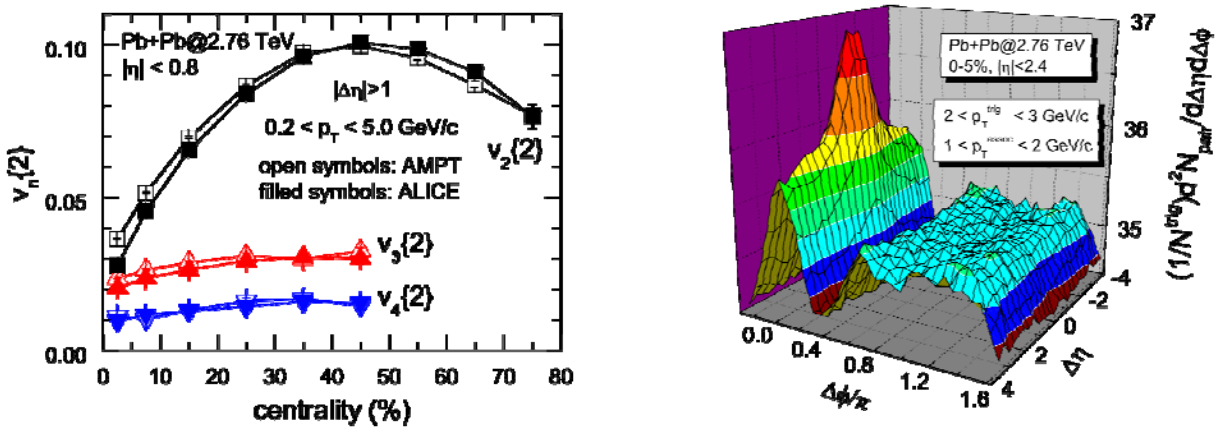

FIG. 1. Left window: Centrality dependence of v_n (n=2,3,4) for mid-pseudorapidity ($|\eta|<0.8$) charged particles obtained from the two-particle cumulant method in Pb-Pb collisions at $\sqrt{s_{NN}}$= 2.76 TeV from the string melting AMPT model. The ALICE data (filled symbols) are taken from Ref.[3]. Right window: Two-dimensional dihadron correlations per trigger particle as a function of $\Delta\eta$ and $\Delta\phi$ for $1 < p_T^{assoc} < 2$ GeV/c and $2 < p_T^{trig} < 3$ GeV/c for 0-5% most central collisions.

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