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Charged hadron azimuthal anisotropy (v_2) in $sqrts_{NN} = 2.76$ TeV PbPb collisions from CMS

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During the past decade, azimuthal correlation measurements have played a pivotal role in our understanding of the properties of high density QCD matter through their sensitivity to the early stage evolution of relativistic heavy-ion collisions. Despite our increased understanding of the transport coefficients of the plasma produced in these collisions, there remain many questions concerning the interplay between initial state conditions, the equation of state, and the evolution of the system through the final hadronization stage. Detailed experimental data obtained for the energy regime accessible using the LHC should help in establishing the shear viscosity to entropy ratio achieved in the produced, strongly interacting matter. The CMS experiment has measured the anisotropy parameter, v2, using four different methods: the event-plane, two or four particle cumulants, and Lee-Yang Zeros. Consistent results are found for the different methods after considering their respective sensitivities to non-flow correlations and event-by-event fluctuations in the initial conditions. The anisotropy is studied as a function of transverse momentum, pseudorapidity and centrality in a broad kinematic range: $0.3 < p_T < 12.0$GeV/c, $|\eta| < 2.4$, and in 12 centrality classes in the range 0-80\%. The scaling of v_2 with participant eccentricity and transverse particle density is examined and compared to lower energy results.

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