

System size and beam energy dependence of azimuthal anisotropy from PHENIX

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The azimuthal anisotropy in particle emission provides a unique tool to probe the dynamics of the hot and dense matter produced in relativistic heavy ion collisions. Previous PHENIX analyses of the azimuthal anisotropy in Au+Au collisions at $\sqrt{s_{NN}} = 200$ GeV have revealed striking scaling properties, most notably with respect to the transverse kinetic energy (KE_T) of particles. The extension of these studies to the Au+Au and Cu+Cu systems at different beam energies is crucial to help characterize the partonic fluid formed at RHIC. Detailed azimuthal anisotropy measurements in Au+Au and Cu+Cu collisions at center-of-mass energies in the range 62.4 - 200 GeV will be studied as a function of p_T , KE_T , centrality and η and the results will be discussed in the context of thermalization and coalescence. The study of the influence of non-flow effects in the different systems is important in order to ascertain the accuracy of the azimuthal anisotropy measurements. This can be done by using different methods which have different sensitivities to non-flow effects. Comparisons between the azimuthal anisotropy in Au+Au and Cu+Cu collisions, obtained from the reaction plane and cumulant methods of flow measurement, will be presented as a function of p_T up to 10 GeV/c. The relative importance of non-flow correlations will be discussed for different colliding systems and centralities.