

Ridge Studies in Pb+Pb Collisions at the LHC based on Number and Transverse Momentum Two-Particle Correlation Functions

Observations of a ridge on the near-side, and a dip on the away-side of two-particle correlations measured in central Au + Au collisions have generated considerable interest at RHIC. Are the two phenomena connected? Do they result from jet interactions with the medium, or do they naturally arise from the rapid thermalization and hydrodynamic expansion of collision systems subject to large initial fluctuations?

We present measurements, carried with the ALICE detector, of number (R_2) and transverse momentum ($\Delta p_t \Delta p_t$) correlation functions in Pb + Pb collisions. The two correlation functions are studied as a function of collision centrality for ++, --, and +- charged particle pairs in various momentum ranges. The like-sign and unlike-sign correlations exhibit a different evolution with collision centrality. We combine these correlations to study charge dependent (CD) and charge independent (CI) correlation functions. We characterize these distributions by studying Fourier decompositions of $\Delta\varphi$ projections of the R_2 and $\Delta p_t \Delta p_t$ correlation functions for different ranges of $\Delta\eta$. Of particular interest are the evolution of the ratios of 3rd, and 4th harmonics to the 2nd harmonics with number of participants. We will discuss these results in light of a MC Glauber model of the initial eccentricity of collision nucleon participants.

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Track Classification: Correlations and fluctuations