

Azimuthally differential pion femtoscopy collisions relative to the second and third harmonic in Pb-Pb 2.76 TeV collisions from ALICE

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Azimuthally differential femtosopic measurements, being sensitive to spatiotemporal characteristics of the source as well as collective velocity fields at freeze-out, provide very important information on the nature and dynamics of

the system evolution. While the radii modulations with respect to the second harmonic event plane reflect mostly the spatial geometry of the source, the third harmonic results are mostly defined by the system dynamics. In this talk, we present the azimuthally differential measurements of the pion source in Pb-Pb collisions relative to the second and the third harmonic event planes as a function of the pion-pair transverse momentum (k_T) for different centralities of the collision. The dependence of the side-, out-, and long-radii on the pion-pair emission angle with respect to the second harmonic event plane qualitatively agrees with theoretical calculations, but the details show significant deviations. The final-state source eccentricity, estimated via side radius oscillations, is found to be significantly smaller than the initial-state source eccentricity, but remains positive at all measured k_T – an indication of the out-of-plane extended source even after strong in-plane expansion. The observation of the radii modulations with respect to the third harmonic event plane unambiguously signal a collective expansion and anisotropy in the flow field. We compare our results to the existing model predictions.

List of tracks

Femtoscopy at RHIC and LHC: links to QGP physics

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