



Contribution ID: 140

Type: Oral Contribution

Centrality dependent Lévy analysis of two-pion Bose-Einstein correlation functions at $\sqrt{s_{NN}} = 200$ GeV at PHENIX.

Tuesday 25 October 2022 15:40 (20 minutes)

We present the recent PHENIX preliminary data on centrality dependence of two-pion Bose-Einstein correlation functions measured in $\sqrt{s_{NN}} = 200$ GeV Au+Au collisions at the Relativistic Heavy Ion Collider (RHIC). The data are well described by assuming the source to be a Lévy-stable distribution. The Lévy parameters, λ , R , α are measured in 23 bins of transverse mass (m_T) for 6 centrality intervals. We observe that $\lambda(m_T)$ is constant at larger values of m_T but decreases as m_T decreases. The centrality dependence of this decrease is determined. The Lévy scale parameter $R(m_T)$ decreases with m_T and exhibits a clear centrality ordering which supports its geometrical interpretation. The Lévy exponent $\alpha(m_T)$ is independent of m_T in every centrality bin but shows some centrality dependence. At all centralities α is significantly different from that of a Gaussian ($\alpha = 2$) or Cauchy ($\alpha = 1$) source distribution. The data are compared to Monte-Carlo simulations of resonance decay chains. In all but the most peripheral centrality class (50-60%) they are found to be inconsistent with the measurements unless a significant reduction of the in-medium mass of the η meson is included. The best value of the in-medium mass is found to be consistent with the Pisarski-Wilczek limit.

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Session Classification: P5 Heavy Ion Collisions and QCD Phases

Track Classification: P5 Heavy Ion Collisions and QCD Phases