

Study of Pion Interferometry in Au-Au collision in STAR Experiment at $\sqrt{s_{NN}} = 7.7$ GeV

Pion Femtoscopy, a sophisticated technique in particle physics, is employed to unveil correlations among pion particles from the source's homogeneity region. Our analysis of collider data from the STAR BES II experiment, focusing on $\sqrt{s_{NN}} = 7.7$ GeV collisions, explores the correlation function across centrality and transverse momentum (K_T) intervals. To ensure robust results, I meticulously manage track effects using tailored cuts derived from the splitting level and fraction of merged rows. My investigation extends to understanding the correlation function's behavior with varying numbers of V_z bins during event mixing, and its response to different V_z ranges for analysis. Integral to my study is fitting the Bowler-Sinyukov function to the correlation function. This yields essential parameters: radii characterizing the source's homogeneity region and correlation strength for positive and negative pions. These parameters offer insights into the particle-emitting environment's dimensions and inter-pion correlations. Additionally, I explore parameter variation in response to changing centrality conditions, deepening my understanding of collision characteristics' impact on the source's behavior.

Primary author: GAURAV, Nishant (Indian Institute of Science Education and Research Kolkata)

Presenter: GAURAV, Nishant (Indian Institute of Science Education and Research Kolkata)

Session Classification: An extra day session