

Beam energy dependence of Levy fit parameters of the HBT correlation functions measured by PHENIX at RHIC

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Bose-Einstein correlations of identical hadrons provide information about the space-time structure of the hadron emission source which reflects the transition from the sQGP to the hadron gas stage in relativistic heavy ion collisions. In the beam energy scan runs at RHIC, this analysis will provide a primary information for exploring the change from crossover to first order phase transition is expected to occur.

The description of the measured correlation functions has been assumed to be Gaussian, but a detailed analysis revealed that the statistically correct assumption is a generalized Gaussian, the so-called Levy distribution. One of the resulting source parameters, the Levy stability parameter α , describing the shape of the source, is related to one of the critical exponents (the so-called correlation exponent η), and thus may shed light on the location of the critical endpoint.

In this presentation we report the detailed measurement of the Levy source parameters as a function of transverse mass in Au+Au collisions at $\sqrt{s_{NN}}$ = 39, 62 and 200 GeV. We will also discuss a newly found scaling parameter, R_{HBT} , as a function of transverse mass (m_T).

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