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Two-particle pion femtoscopy with Lévy sources from 13 to 150A GeV/c at NA61/SHINE

The most recent measurements of femtoscopic correlations at NA61/SHINE, using intermediate collision systems, unravel that the shape of the particle emitting source exhibits non-Gaussian properties over the available energies. The measurements are based on alpha-stable symmetric Lévy sources, and we discuss the average pair transverse mass dependence of the source parameters. One of the parameters, the Lévy exponent, is of particular importance. The exponent not only describes the shape of the source, but also may be related to the critical point of the phase diagram. Its measurement, hence, may contribute to the search for and characterization of the critical endpoint of the phase diagram and the shape of the particle emitting source.

Moreover, one of the most important goals of NA61/SHINE is to investigate and understand the phase structures of this strongly interacting matter. The investigation of the phase diagram can be achieved by varying the beam momentum (13A-150(8)A GeV/c) or by changing the collision system (p+p, p+Pb, Be+Be, Ar+Sc, Xe+La, Pb+Pb). Measuring the correlation functions in different systems at different energies enables us to perform a two-dimensional scan of the QCD phase diagram. The search in the collisions may then reveal the properties of sQGP and possible signs of the critical endpoint.

Category

Experiment

Collaboration (if applicable)

NA61/SHINE

Author: PORFY, Barnabas (HUN-REN Wigner Research Centre for Physics (HU))

Presenter: PORFY, Barnabas (HUN-REN Wigner Research Centre for Physics (HU))

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