

WPCF 2023 - XVI Workshop on Particle Correlations and Femtoscopy & IV Resonance Workshop 2023



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Femtoscopy with Lévy sources at NA61/SHINE

Thursday, 9 November 2023 15:05 (25 minutes)

One of the most important goals of NA61/SHINE is to investigate and understand the phase structures of hadronic matter. The investigation of the phase-diagram can be achieved by varying the beam momentum (13A-150(8)A GeV/c) and by changing the collision system (p+p, p+Pb, Be+Be, Ar+Sc, Xe+La, Pb+Pb). This method enables to perform a two-dimensional scan of the phase diagram of QCD. Investigating femtosopic correlations are related to the critical exponent η , describing the spatial coordinates. The search in the collisions reveals the properties of sQGP and possible signs of the critical endpoint. The recent measurements of femtosopic correlations at NA61/SHINE, using small and intermediate systems, unravel that the shape of the particle emitting source is not Gaussian. The analysis of measurements is 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 α , is of particularly importance. It describes the shape of the source, which, in the vicinity of the critical point of the phase diagram, may be related to the critical exponent η . Its measurement hence may contribute to the search for and characterization of the critical endpoint of the phase diagram.

Primary author: PORFY, Barnabas (Eotvos University, Wigner RCP)

Presenter: PORFY, Barnabas (Eotvos University, Wigner RCP)

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