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# Hydrodynamic fluctuations and two-particle correlation functions

The field of high-energy nuclear collisions has witnessed a surge of
interest in recent years in the role played by hydrodynamic fluctuations.
Hydrodynamic fluctuations may have significant effects on systems created
at RHIC, FAIR or NICA whose trajectories in the QCD phase diagram pass
near a possible critical end point (CEP). To test for the existence of
such a CEP, it is vital to understand the connections between a system's
proximity to the CEP and the properties of observables used in probing
heavy-ion collisions. So far, the properties of the two-particle
correlation function, as defined by HBT interferometry, have remained
unexplored in this respect. We discuss the effects of event-by-event hydrodynamic
fluctuations on both the two-particle correlation function and the HBT
radii extracted from it. For simplicity, we assume a system characterized
by Bjorken symmetry and study the fluctuations of the correlation function
and HBT radius along the longitudinal direction as functions of rapidity
distance $\Delta y$. We show how these quantities are affected by hydrodynamic fluctuations along trajectories in
the QCD phase diagram
which pass close to the CEP.

## Preferred Track

Correlations and Fluctuations

## Collaboration

Not applicable

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