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Thermal blurring effects on fluctuations of conserved charges in rapidity space

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We study the effect of the difference between momentum- and coordinate-space rapidities on the experimental measurements of fluctuation observables in relativistic heavy ion collisions. In theoretical studies on fluctuation observables, observables in fixed coordinate-space rapidity windows are concerned because the analyses are usually performed in finite volume. The experimental measurements, however, can be performed only for momentum-space (or pseudo-) rapidity. The latter is usually used as a proxy of the former implicitly. However, thermal motion blurs this one-to-one correspondence.

We investigate this effect quantitatively, and show that thermal motion gives rise to significant effects, which should be carefully taken into account in the interpretation of the experimental results of fluctuation observables.

It is argued that this modification can be estimated by the study of the rapidity window dependences of the cumulants and implemented in the description of the time evolution of fluctuations.

On behalf of collaboration:

NONE

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