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## Rapidity decorrelation from hydrodynamic fluctuations

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Fluctuations have been playing an important role in understanding observables in high-energy nuclear collisions. Higher harmonics of azimuthal angle distributions, for example, can be attributed to initial fluctuations of transverse profile from event to event. In this presentation, we focus on thermal fluctuations during hydrodynamic evolution (a.k.a. hydrodynamic fluctuations) of the QGP fluids in the intermediate stage and investigate the effects of them on several observables in high-energy nuclear collisions.

We employ an integrated dynamical model [2,3] which combines full three-dimensional relativistic fluctuating hydrodynamics with Monte-Carlo version of the Glauber model for event-by-event initialization and the hadronic cascade model in the late rescattering stage. By using this model, we first adjust initial parameters and transport coefficients to reproduce  $dN_{ch}/d\eta$  and centrality dependence of integrated  $v_2$  in Pb+Pb collisions at the LHC energy. We next analyze  $r_{n;1}(\eta)$  and observables for longitudinal flow correlations of the  $n$ -th order higher harmonics  $R_{n;n;n}(\eta)$  [4] for separation of the flow magnitude fluctuations from the event-plane twist along the rapidity. From this analysis, we see how hydrodynamic fluctuations break up longitudinal correlations of the magnitude and the event-plane angle of anisotropic flow parameters.

### References

- [1] K.~Murase and T.~Hirano, Relativistic fluctuating hydrodynamics with memory functions and colored noises, arXiv:1304.3243 [nucl-th].
- [2] Koichi Murase, Causal hydrodynamic fluctuations and their effects on high-energy nuclear collisions, Ph.-D thesis, the University of Tokyo (2015).
- [3] K.~Murase and T.~Hirano, Hydrodynamic fluctuations and dissipation in an integrated dynamical model, arXiv: 1601.02260 [nucl-th].
- [4] Jianguong Jia et al., Observables for longitudinal flow correlations in heavy-ion collisions, arXiv:1701.02183 [nucl-th].

### Content type

Theory

### Collaboration

### Centralised submission by Collaboration

Presenter name already specified

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