

# Dynamics of causal hydrodynamic fluctuations in an expanding system

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Since phenomena induced by the hydrodynamic fluctuations include the information of transport coefficients, the study of fluctuations could open up a new way of diagnosing the QGP precisely. We derive equations of motion (EoM) of hydrodynamic fluctuations by considering the perturbative expansion of energy-momentum tensor around the Bjorken's boost invariant solution. These EoMs are derived without any specific forms of constitutive equations. Therefore, one can employ the second order constitutive equations which satisfy the causality. With this framework, we analyze the dynamics of (1+1)D causal hydrodynamic fluctuations and observe streak like structure through the time evolution of energy density. It indicates that the distribution of energy density tends to be frozen during evolution and carries the information of the early stage of evolution. Furthermore, we analyze correlations of fluctuations and find their behaviors are closely related with the properties of the medium.

## Theory / experiment

Theory

## Group or collaboration name

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