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## Thermal fluctuations in heavy ion collisions

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The thermal fluctuations inherent in viscous hydrodynamics are significant when examining a fluid either at small length scales or near a critical point. Both of these conditions can be met in ultra-relativistic heavy-ion collisions. These fluctuations have small but non-vanishing effects on observables at the Relativistic Heavy-Ion Collider (RHIC) and at the Large Hadron Collider (LHC). Because the amplitudes of the fluctuations are related to viscosity through the fluctuation-dissipation relation, the effects of fluctuations on observables may lead to an independent measurement of transport coefficients in quark-gluon plasma. Numerical simulation of the propagation of thermal noise is necessary even in the linearized limit, and can be used to examine the effect of thermal fluctuations on observables.

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