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Simulations of stochastic fluid dynamics near a critical point

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We present numerical simulations of stochastic fluid dynamics with a conserved charge coupled to the momentum density of the fluid. This theory is known as model H, and it is expected to describe universal dynamics in the vicinity of a possible critical endpoint in the QCD phase diagram. We verify dynamical scaling, extract the scaling exponent z, and compute the renormalization of shear viscosity. In a finite system, we observe a crossover between the mean field value z = 4 and the true critical exponent $z \sim 3$. We show that this crossover is sensitive to the values of the correlation length and the renormalized shear viscosity.

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