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Transverse momentum fluctuations in event-by-event viscous hydrodynamics

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Results of event-by-event simulations of a 3+1D viscous hydrodynamic model for Au-Au collisions at 200 GeV are presented. The fluctuations of the average transverse momentum in an event are determined by the fluctuations of the initial transverse size of the fireball. The mechanism involving transverse-momentum fluctuations from the initial size fluctuations, transmitted to the final statistical-hadronization phase with hydrodynamics, is capable of easily reproducing the magnitude of the effect and explains the basic features of the data. The momentum fluctuations present a complimentary information about the collective expansion of the fireball to the widely discussed harmonic flow coefficients. The scaled transverse momentum fluctuations are not changed significantly when modifying the viscosity or the freeze-out temperature.

P. Bozek, W. Broniowski, Phys. Rev. C85, 044910 (2012)

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