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Transverse momentum fluctuations and correlations

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We study the fluctuations and correlations of the average transverse momentum of particles emitted in heavy-ion collisions. The momentum fluctuations are related to event-by-event fluctuations of the size and entropy of the initial source. Hydrodynamic calculations using a Glauber model with quark degrees of freedom reproduce the data. We study correlation of the average transverse momentum in different rapidity bins. We propose a definition of the observable that can be directly related to correlations of the collective flow variables. The correlation as function of rapidity separation can serve to pin down possible sources of momentum fluctuations in the initial state and the dynamics.

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