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Viscous Diffusion and Transverse Momentum Correlations at RHIC and LHC RAJENDRA POKHAREL, SEAN GAVIN, Wayne State University, GEORGE MOSCHELLI, J.W. Goethe Universitat — RHIC experiments indicated that the matter formed in relativistic nuclear collisions flows like a nearly perfect fluid, with a small viscosity to entropy density ratio. Various estimates from elliptic flow measurements give 1-2 times the Kovtun-Son-Starinets bound. However, there is theoretical uncertainty resulting from our incomplete knowledge of initial conditions, equation of state and the role of the mini-jets. Recently, the STAR collaboration reported measurements of using transverse momentum correlations. The idea behind this method is that shear viscosity diffuses the distribution of transverse momentum fluctuations reducing the peak value of the correlation function while broadening its rapidity distributions and thus relating the viscosity to evolution of the width. This approach to viscosity is different from those involving elliptic flow. Here we present the theory using the second order viscous hydrodynamics and compare the calculations with recent STAR data.

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