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Fluctuation and Correlation Probes of Early Time Dynamics[1]
SEAN GAVIN, Wayne State University, GEORGE MOSCHELLI, Frankfurt Institute for Advanced Studies, Johann Wolfgang Goethe University — Measurements of two-particle correlations in nuclear collisions exhibit a complex pattern of ridges, peaks, and valleys as functions of relative pseudorapidity and azimuthal angle. The azimuthal dependence of these correlations can be described as anisotropic flow by introducing a novel triangular v3 component comparable to the more familiar elliptic v2 contribution. Triangularity has been attributed to by event-wise fluctuations in the initial shape of the collision volume. We ask two questions: 1) How do shape fluctuations impact other event-by-event observables? 2) Can we disentangle fundamental information on the early time behavior that produces these fluctuations from the complex flow that results? We study correlations and fluctuations in a framework in which an early Glasma stage produces fluctuations in the number and position of flux tubes in concert with late-stage hydrodynamic flow. We show how flow observables v1, v2, and v3 can be combined with multiplicity and transverse momentum fluctuations to disentangle Glasma information from hydrodynamic effects. Computations are then compared to a range of LHC and RHIC data

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