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Triangular Flow in Relativistic Heavy Ion Collisions in an Event-by-Event Hybrid Approach

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Triangular flow has been shown to be an interesting new observable to gain insights about the properties of hot and dense strongly interacting matter as it is produced in heavy ion collisions at RHIC and LHC. We will present triangular flow results for Au+Au collisions at the highest RHIC energy calculated in a hybrid approach that includes a non-equilibrium initial evolution and an ideal hydrodynamic expansion with a hadronic afterburner in 3+1 dimensions. By comparing the hybrid approach calculation with a pure transport approach, the influence of viscosity is studied. In addition, the potential of triangular flow for constraining the initial state granularity will be discussed. We compare the results from Au+Au collisions at 200 GeV per nucleon to Pb+Pb at LHC energies and find that the fluctuations/ v_3 values at LHC are surprisingly similar. Furthermore, the longitudinal long-range correlations of the triangular flow event plane angle are explored for initial conditions from a partonic and a hadronic transport approach. We conclude that longitudinal long-range correlations are not a unique signature for flux tube-like initial conditions, but can also be produced by other mechanisms.

Author: PETERSEN, Hannah (Duke University)**Presenter:** PETERSEN, Hannah (Duke University)**Session Classification:** Heavy Ion Physics/Hot and Dense QCD**Track Classification:** Heavy Ion Physics/Hot and Dense QCD