

Collective flow in 2.76 and 5.02 A TeV Pb+Pb collisions

Summary

Collective flows are important observables to study the properties of the QGP in relativistic heavy ion collisions. Recently, the AILCE collaboration has measured many flow observables in 2.76 A TeV and 5.02 A TeV Pb+Pb collisions. In order to study and predict these flow observables, we run VISHNU hybrid model simulations with the TRENTo and AMPT initial conditions and with different forms of the QGP transport coefficients. More specifically, we calculate the integrated and differential v_n of all charged and identified hadrons, the event-by-event v_n distributions, the nonlinear response coefficients of higher-order flows harmonics, the event-plane correlations, the correlations between different flow harmonics, and p_T -dependent factorization ratio, etc. We found some of the flow observables, such as the integrated and differential v_n of all charged and identified hadrons, which can be quantitatively described by the hybrid model simulations, are insensitive to the initial conditions used in our calculations as long as the transport coefficients are properly tuned. We also qualitatively explore the general properties of other flow observables, such as the flow correlations, the non-linear response coefficients of higher-order flow harmonics and p_T -dependent factorization ratio with different initial conditions and transport coefficients and hope such theoretical investigations and predictions could shed light to the experimental measurements in the future.

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