

Probing Collision Size and Energy Dependence of Longitudinal Flow De-correlation with STAR

December 1, 2021

Studies of longitudinal de-correlation of anisotropic flow provide unique constraints on the initial conditions and dynamical evolution of the quark-gluon-plasma in heavy-ion collisions. With data collected by the STAR experiment at RHIC, the factorization ratio for flow harmonics, $r_n(\eta)$ ($n = 2, 3$) and $R_2(\eta)$, are obtained over a wide η range as functions of centrality and transverse momentum for 200 GeV Ru+Ru and Zr+Zr collisions as well as 19.6 GeV and 14.5 GeV Au+Au collisions. The results provide new and systematical insights into the three-dimensional modeling of the evolution of relativistic heavy-ion collisions, especially its dependence on the size and energy of collision system when compare to the results of 200 GeV Au+Au collision. Comparison with hydrodynamic model calculations will be discussed.

Possible speaker: Gaoguo Yan, Maowu Nie, Zhenyu Chen