Longitudinal De-correlation of Anisotropic Flow at RHIC-STAR

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Studies of longitudinal de-correlation of anisotropic flow can provide unique constraints on the three-dimensional structure of the initial state and dynamical evolution of the quark-gluon-plasma in heavy-ion collisions. Experimentally, the factorization ratio, $r_n(\eta)(n = 2, 3)$, is used to quantify the amount of the longitudinal flow de-correlation with pseudorapidity [1-3]. With data collected by the STAR experiment at RHIC for 200 GeV Ru+Ru and Zr+Zr collisions as well as 19.6, 27, and 54.4 GeV Au+Au collisions, we will present the centrality and collision energy dependence of $r_n(\eta)(n = 2, 3)$. These results can provide new insights into the three-dimensional modeling of the relativistic heavy-ion collisions.

[1] The CMS Collaboration, Phys. Rev. C 92, 034911 (2015).
[2] The ATLAS Collaboration, Eur. Phys. J. C 78, 142 (2018).
[3] The ATLAS Collaboration, Phys. Rev. Lett. 126, 122301 (2021).