

# Longitudinal De-correlation of Anisotropic Flow in Au+Au Collisions at $\sqrt{s_{\text{NN}}} = 27$ and 54.4 GeV from STAR

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1        Studies of longitudinal de-correlation of anisotropic flow provide unique  
2 constraints on the initial conditions and dynamical evolution of the quark-  
3 gluon-plasma in heavy-ion collisions. With data collected by the STAR ex-  
4 periment at RHIC, the factorization ratio for flow harmonics,  $r_n(\eta^a, \eta^b)$  ( $n =$   
5  $2, 3$ ), are obtained over a wide  $\eta$  range for 27 and 54.4 GeV Au+Au col-  
6 lisions as a function of centrality and transverse momentum. Comparing  
7 to results from LHC and 200 GeV Au+Au collisions, we observe a clear  
8 collision-energy dependence indicating a stronger longitudinal de-correlation  
9 at lower collision energies. The results provide new insights into the three-  
10 dimensional modeling of the evolution of relativistic heavy-ion collisions and  
11 the shear viscosity of the QGP, especially their collision energy dependence.  
12 Comparison with the hydrodynamic model calculations will be included.