

1 Measurements of longitudinal decorrelation of anisotropic flow  
2 in 27, 54.4 and 200 GeV Au+Au collisions from STAR

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5 Studies of longitudinal decorrelation of anisotropic flow provide unique  
6 constraints on the initial conditions and dynamical evolution of the quark-  
7 gluon-plasma in heavy-ion collisions. With data collected by the STAR ex-  
8 periment at RHIC, the factorization ratio for flow harmonics,  $r_n(\eta, \eta_{ref})(n =$   
9  $2, 3)$ , are obtained over a wide  $\eta$  range for 27, 54.4 and 200 GeV Au+Au  
10 collisions as a function of centrality. We observe a clear collision energy de-  
11 pendence indicating a stronger longitudinal decorrelation at lower collision  
12 energies. The 4-particle correlator ( $R_n(\eta, \eta_{ref})(n = 2, 3)$ ) used to separate  
13 the event-plane twist from  $v_n$  magnitude fluctuations, will also be presented.  
14 The results provide new insights into the three-dimensional modeling of the  
15 initial stage and the evolution of relativistic heavy-ion collisions, especially  
16 their collision energy dependence.