STAR Measurement of Longitudinal Decorrelation of Elliptic Flow from Au+Au Collisions at $\sqrt{s_{NN}}$ = 200 and 27 GeV.

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Measurement of pseudorapidity dependence of local event plane correlations may reveal the possible existence of twist in participant matter density distribution, which provides a novel input in initial conditions of heavy-ion collisions. The factorization ratio, $r_2(\eta) = \frac{\langle V_2(-\eta,\eta^{ref})\rangle}{\langle V_2(\eta,\eta^{ref})\rangle}$, has been extensively used to quantify this longitudinal decorrelation of elliptic flow. However, non-flow effects could also contribute to the r_2 value. In this poster, in order to distinguish these mechanisms, we explore the dependence of r_2 on the η coverage of the event plane, p_T of particles of interest, and event shape as a function of centrality based on the STAR data of Au+Au collisions at 27 and 200 GeV. Observation on η, p_T and beam energy dependence implies possible non-flow contribution. An alternative observable, correlating the forward, backward and midrapidity event planes, $\langle \sin(2(\Psi_f - \Psi_{mid,1}))\sin(2(\Psi_b - \Psi_{mid,2}))\rangle$, will be carried out to further probe the genuine flow decorrelation. We also compare the STAR measurement with simulation from AMPT, where the model results seem to overpredict the magnitude of r_2, presumably arising from the difference in the initial geometry.