Probing nuclei deformation via flow harmonics and mean $p_T$ fluctuations in heavy-ion collisions from STAR

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Collective phenomena in heavy-ion collisions are very sensitive to initial geometry including nuclei deformation effect. Such deformation effect can be studied by comparing Au+Au and U+U collisions. We present measurements on the fluctuations of flow harmonics ($v_n$), mean transverse momentum ($\langle p_T \rangle$) and their correlations in Au+Au at $\sqrt{s_{NN}} = 200$ GeV and U+U at $\sqrt{s_{NN}} = 193$ GeV collisions with the STAR detector at RHIC. The results are compared with recent theoretical model predictions. This comparison is sensitive to the medium properties such as equation of state. The constraints on the difference of nuclei deformation between Au+Au and U+U are discussed.