

Event anisotropy v_2 of identified hadrons and light nuclei in Au+Au collisions at $\sqrt{s_{NN}} = 7.7, 11.5$ and 39 GeV with STAR

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The main goal of the RHIC Beam Energy Scan (BES) is the exploration of the QCD phase diagram in the region of a possible phase transition between the Quark Gluon Plasma (QGP) and the hadron gas phase. In the year 2010 the first part of the BES program was successfully accomplished by recording data from Au+Au collisions at $\sqrt{s_{NN}} = 7.7, 11.5$ and 39 GeV. The second harmonic (v_2) of the azimuthal particle distribution relative to the reaction plane was found to be one of the most important observables to study the underlying dynamics in the early stage of the collisions. The number-of-constituent quark (NCQ) scaling of v_2 is interpreted as a signature of deconfinement and existence of the QGP phase. At the lower energies studied it was expected to see a change in this scaling behaviour as the role of the QGP phase should diminish.

We present v_2 measurements at all three beam energies for identified hadrons ($\pi, K, K_s^0, p, \phi, \Lambda, \Xi$) and light nuclei (d and 3He) as a function of p_T for various collision centralities. The measured nuclei v_2 are compared to the proton v_2 and results from a dynamical coalescence model calculation, while the NCQ scaling is tested using all identified hadrons. For the first time, a significant difference in v_2 between baryons and anti-baryons is observed. The difference increases with decreasing center-of-mass energy.

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