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STAR Measurements of Elliptic Flow in Small Collision Systems

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The coefficient of the second harmonic in azimuthal anisotropy (v_2) of produced particles gives insight to bulk properties of the medium being created in high-energy heavy-ion collisions. These measurements have provided important evidence of the partonic collective motion in the quark-gluon plasma (QGP). In recent years, the study of collective motion in small systems has gained increased attention. These studies aim to answer the questions of how small a QGP droplet can be and what is the boundary between a confined and deconfined medium. However, non-flow correlations, especially due to jets and di-jets, can influence the observed flow and may tend to dominate in small systems. Therefore, special care has to be taken to differentiate collectivity from non-flow contributions.

In this poster, we present the STAR measurements of charged-hadron elliptic flow, v_2, in p+Au collisions at $\sqrt{s_{NN}} = 200$ GeV, and in d+Au collisions at 200, 62.4, 39 and 19.6 GeV. Data analysis is done with the event plane method, and with 2-particle and 4-particle cumulants. The results will be shown as a function of multiplicity which provides control of the system size. This will be compared with peripheral Au+Au collisions with similar multiplicities at the same center of mass energies to determine whether or where the onset of the QGP exists in these small systems.

Content type

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