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# PHENIX Results on Collectivity in Small Systems

*Thursday, May 31, 2018 2:40 PM (20 minutes)*

To answer the question of how small a system can be while still exhibiting collective behavior, the PHENIX experiment has used RHIC's extraordinary versatility to design a set of experiments controlling the initial geometry of the collisions by selecting different colliding species, $p/d/^3$He+Au. In addition, a beam energy scan with $d$+Au collisions was done to vary the lifetime of the system while keeping the initial geometry constant.

In this talk we show PHENIX measurements of elliptic and triangular flow of charged hadrons and elliptic flow of identified hadrons at midrapidity as a function of transverse momentum in $p/d/^3$He+Au collisions at 200 GeV per nucleon center-of-mass energy. Measurements of elliptic flow of charged hadrons in $d$+Au collisions at 200, 62.4, 39, and 19.6 GeV per nucleon center-of-mass energy will also be presented as a function of transverse momentum and pseudorapidity.

In order to assess the origin of collectivity in the smallest systems, these results are compared with several theoretical models that produce azimuthal particle correlations based on initial and/or final state effects. Hydrodynamical models which include a droplet of quark gluon plasma provide the best simultaneous description of our observations.

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