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# Spectra of identified particles, geometry categorization and bias, and global observables in d+Au collisions

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In this talk the transverse momentum spectra of identified particles, geometry categorization and bias, and global observables in d+Au collisions at 200 GeV are reported. In d+Au collisions, the intermediate $p_T$ region between 2 and 5 GeV, there is a significant enhancement of the baryon to meson ratios relative to those measured in p+p collisions. The enhancement is present in d+Au collisions as well as Au+Au collisions and increases with centrality. We compare a class of peripheral Au+Au collisions with a class of central d+Au collisions which have a comparable number of participants and binary collisions. The $p_T$ dependent ratios for these classes display a remarkable similarity. The nuclear modification of hadrons at higher transverse momentum also reveal interesting effects. Geometry selection in d+Au/p+Pb collisions is crucial for understanding the physics underlying modified nuclear parton distribution functions, gluon saturation and glasma diagrams, initial state energy loss, and possible hydrodynamic flow in these small systems. Data from the p+Pb LHC results indicate potentially large biases in the geometry determination in these small systems. The PHENIX collaboration presents tests of auto-correlation biases. Our findings indicate that these biases are an order of magnitude smaller at RHIC as compared to the LHC, and are thus well quantified. Geometry tests with neutron-tagged events and the centrality scaling of $\mathrm{d}N_{ch}/d\eta$ and $\mathrm{d}E_T/d\eta$ are presented.

## On behalf of collaboration:

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