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A Multiplicity Selection Effect on the Long-range Dihadron Correlation Measurement in d+Au Collisions at RHIC

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A long-range (large |\Delta\eta|) two-particle azimuthal (\Delta\phi) correlation ("ridge") was observed in high-multiplicity p+p and p+Pb collisions at the LHC. Subtraction of two-particle correlations in high- and low-multiplicity events reveals a back-to-back double ridge (\Delta\phi=0 or \pi). A similar double ridge was observed in d+Au collisions with the same technique by the PHENIX experiment at RHIC. This talk reports results of the ridge in d+Au collisions with the STAR detector at RHIC. The dihadron correlations are studied for different multiplicity and zero-degree neutral energy classes. It is found that the ridge on the away-side (around \Delta\phi=\pi) in d+Au collisions is strongly influenced by jet-like correlations. The mid-rapidity jet correlated particle yields differ between low- and high-multiplicity d+Au collisions. With the STAR detector's large acceptance, the near-side (\Delta\phi=0) ridge correlated yield \Delta\eta and multiplicity dependences are studied. The long-range near-side ridge is observed on the Au-going side for high-multiplicity events. In a Fourier decomposition of the dihadron correlations, the second Fourier coefficients are observed to be the same for low- and high-multiplicity, d- and Au-going side, despite the large multiplicity difference and near-side ridge appearance difference. This near-side ridge yield difference is found to be due to the large negative first Fourier coefficients in the low-multiplicity and d-going side. We will discuss the implications of the STAR data on the theoretical explanations for the ridge mechanism in d+Au collisions.

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