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Systematic study of the parton energy loss from p(d, ^{3}He)+A to A+A collisions using high p_{T} hadrons measured by the PHENIX experiment at RHIC

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The energy loss of the hard scattered partons in the hot dense medium produced in relativistic heavy ion collisions has been of interest for investigating the properties of the medium.

Recently, the second-order azimuthal anisotropy of particle emission has been observed at a low p_{T} (1-3GeV/c for the RHIC case) in long-range two-particle correlations in small systems such as d+Au collisions at RHIC and p+Pb collisions at LHC. At higher p_{T}, on the other hand, the strength of the anisotropy tends to become weaker, which is qualitatively similar to what was observed in A+A collisions. In A+A collisions, the anisotropy at higher p_{T} has been understood as the consequence of the path-length dependent energy loss of hard scattered partons. It is of a great interest whether or not the similar energy loss phenomenon is observed in the small systems (p+A, d+A).

We present a systematic study of the azimuthal anisotropy of particle emission from p(d, ^{3}He)+A to A+A collisions using high p_{T} hadrons measured by the PHENIX experiment at RHIC, and discuss the systematics of the parton energy loss across the systems.

On behalf of collaboration:

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