

Effect of p_T broadening in inclusive jet and hadron-jet suppressions

The effect of the transverse momentum broadening to the total jet energy loss within a given jet cone-size, and therefore to the nuclear suppression factor are studied. The radiated gluons induced by the medium are mostly collinear with the mother parton. Therefore, the energy carried by the radiated gluons outside of the jet-cone is very small. However, the p_T broadening effect can enlarge the angle between the mother parton and the radiated gluons. We found that this p_T broadening effect is very important, which almost doubled the radiative energy loss. We also studied the collisional energy loss based on the pQCD calculation. We found that the collisional energy loss is very small comparing with the radiative energy loss.

We carried out the calculation for the nuclear modification factor of the single jet production, R_{AA} . We found our results can describe the ALICE and ATLAS data with different cone-sizes very well. We also calculated the suppression of the per-trigger yield of hadron-jet production, and compared with the latest data, which is not only sensitive to the full jet energy loss but also sensitive to the leading parton energy loss.

Preferred Track

Jets and High p_T Hadrons

Collaboration

Not applicable

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