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Studying Geometric Bias for Jet-Hadron Correlations with Monte Carlo Models

A key topic of interest in studies of jets in heavy ion physics is the path-length dependence of jet-medium interactions. In this contribution, Monte Carlo event simulators are used to estimate the path-length traversed by the recoil jet, under a varying range of trigger conditions. These simulations are then used to make predictions for studies of jet-hadron correlations, where a high pT jet is used as a trigger, and the distribution of associated particles from the awayside is examined.

Since we cannot experimentally measure the location of a hard-scatter vertex or the path-length traversed by the resulting partons, we require models to understand the role of path-length in experimental analysis. With Monte Carlo event generators, we can directly track the path-length of the trigger jet and the recoil jet. An especially interesting quantity is how biased the trigger is towards the surface, since the recoil jet from a surface biased trigger is likely to traverse a longer path. This is connected back to experiment by predicting how much jet energy loss resulting in softening and broadening can be observed in jet-hadron correlations.

Conditions that have been considered for their effect on the geometric bias include the pT of the jet, cuts on the constituents used to reconstruct the jet, and the jet's angle relative to the reaction plane. The Monte Carlo event generators used include JEWEL and YaJEM.

Preferred Track

Jets and High pT Hadrons

Collaboration

Not applicable

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