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Measuring the Fragmentation Function of Jets in Heavy Ion Collisions Using Jet-Hadron Correlations

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An important observable for studying partonic energy loss in high energy nucleus-nucleus collisions is the jet fragmentation function. Detailed investigation of low momentum (10-60 GeV) jet fragmentation functions may complement previous studies by providing more information on energy loss. The main difficulty in studying low momentum jets in heavy ion collisions is the presence of a significant uncorrelated background of low momentum hadrons from soft processes. One way to deal with this background is to use the jet-hadron azimuthal correlation to fit and subtract the soft, flow correlated background information from the jet. This technique allows one to measure the near side yield in the correlation function after background subtraction for a large number of events binned in jet transverse momentum and hadron transverse momentum. From these yields binned in transverse momentum, one can then construct a fragmentation function. We discuss the specifics of this proposed method of measuring the fragmentation function including corrections for detector effects. We present the results of a Monte Carlo study using Pythia and a custom made Heavy Ion Background Generator (along with mocked up detector effects) that demonstrate the feasibility of this method.

Preferred track

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