Hard Probes 2018: International Conference on Hard & Electromagnetic Probes of High-Energy Nuclear Collisions

Contribution ID: **182** Type: **2a) Jets and high-pT hadrons (TALK)**

Measurements of the jet internal sub-structure and its relevance to parton evolution in p+p and Au+Au collisions at STAR

Thursday, 4 October 2018 11:25 (20 minutes)

Recent measurements of jet structure modifications at RHIC and LHC highlight the importance of differential measurements to study the nature of jet quenching. Since these jet structure observables are intimately dependent on parton evolution in both the angular and energy scale, measurements are needed to disentangle these two scales in order to probe the medium at difference length scales to study its characteristic properties such as the coherence length. To that effect, the STAR collaboration presents fully unfolded results of a jet's internal sub-structure via the Softdrop groomed jet radius (R_g) and the shared momentum fraction (z_g) in p+p collisions at 200 GeV as a function of jet momenta and for a variety of jet radii. In applying the Softdrop criterion recursively on a given jet in p+p collisions, we also showcase the first measurement of the jet virtuality evolution in both the angular and momentum scales in data. The recursive measurements allows us to test the self-similarity of the Altarelli-Parisi splitting function measured as a function of z_g. We compare our measurements to current Monte Carlo models on the market leading to stringent constraints on model parameters.

Having established the p+p baseline, we present the first measurement of the jet‘s inherent angular structure in Au+Au collisions at 200 GeV via an experimentally robust observable related to the SoftDrop R_g such as the opening angle between the two leading sub-jets (θ_{sj}). We utilize the 2014 dataset with a significant increase in statistics offering extended kinematic reach and the ability to perform more differential analyses. In Au+Au collisions, we use the specific di-jet selection introduced in our previous momentum imbalance measurement. By studying traditional jet quenching observables such as A_J and recoil coincidence spectrum as a function of jets belonging to a particular angular class based on the θ_{sj} observable, we directly probe the medium response to jets at a particular resolution scale to look for signatures of coherent or de-coherent energy loss.

Summary

Primary author: Dr KUNNAWALKAM ELAYAVALLI , Raghav (Wayne State University)

Presenter: Dr KUNNAWALKAM ELAYAVALLI , Raghav (Wayne State University)

Session Classification: Parallel 2