

Jennifer Roloff – HEP Seminar 1/26/2021  
Brookhaven National Lab

Title: Exploring QCD with Jet Substructure at the LHC

Abstract: The inner structure of jets is sensitive to QCD across a wide range of scales, from the perturbative parton shower down to non-perturbative hadronization effects. This information has been used in many searches for distinguishing between different types of jets, but it has been challenging to produce theoretical predictions for these substructure observables due to the presence of non-global logarithms. Recent advances in jet grooming algorithms have made it possible to produce calculations beyond leading logarithmic accuracy for jet substructure observables for the first time at a hadron collider. I will discuss the measurement of the Soft Drop jet mass using data from the ATLAS experiment, which was the first measurement of a substructure observable which could be compared to theoretical predictions beyond leading logarithmic accuracy. I will then discuss the implications of this work, including the possibilities for Monte Carlo tuning as well as measurements of Standard Model parameters.