Measurements of jet substructure in p+p and jet-event activity correlations in p+Au collisions at $\sqrt{s_{\rm NN}}$=200 GeV at STAR

the STAR Collaboration

In vacuum, a highly virtual parton fragments into a collimated spray of hadrons—known as a jet. Jets are useful in studying both perturbative and non-perturbative regimes of QCD. In p+p collisions, jet substructure observables are used to study the QCD evolutions and hadronization. In addition, measurements of the event activity dependence of jet properties in p+A collisions can provide new insights to the initial states of these collisions.

In this talk, we present recent results on the jet substructure observables, such as jet mass, jet charge and their correlations, as well as the two-point energy-energy correlator, in p+p collisions at $\sqrt{s}$ = 200 GeV. We report the comparisons between data and different versions of PYTHIA and HERWIG event generators. We also report the correlations between event activities and hard scatterings in p+Au collisions at $\sqrt{s_{\rm NN}}$ = 200 GeV. Dijet acoplanarity and transverse momentum imbalance measurements for different event activities are presented to study the cold nuclear-medium effect in those p+Au collisions.