

Abstract Submitted
for the DNP19 Meeting of
The American Physical Society

First measurements of the jet mass in p+p collisions at $\sqrt{s} = 200$ GeV at STAR¹ ISAAC MOONEY, Wayne State University, STAR COLLABORATION — Partonic energy loss in a hot, dense QCD medium may be dependent on the parton's virtuality. In this talk, we present the first measurements of a related observable called the jet invariant mass, M , in p+p collisions at $\sqrt{s} = 200$ GeV at STAR. We also present the SoftDrop groomed mass, M_g , for which the contribution of wide-angle non-perturbative radiation is suppressed, facilitating comparisons with Monte Carlo simulations. The measurements are differential in both the jet transverse momentum, p_T , and jet radius parameter, R . After fully correcting for detector effects, we compare our jet mass and groomed mass results to leading-order Monte Carlo event generators PYTHIA and HERWIG, which differ both in parton shower and hadronization mechanisms. We find that PYTHIA6 tuned to RHIC kinematics agrees well with the measurement, while the corresponding LHC tunes for PYTHIA8 and HERWIG7 have significant disagreement with the data. Such a comparison presents an opportunity for further tuning of Monte Carlo event generators. Study of the jet mass in p+p collisions will serve as a baseline for future work in p+A and A+A collisions to explore cold and hot nuclear matter effects.

¹This material is based upon work supported by the U.S. Department of Energy Office of Science, Office of Nuclear Physics under Award Number DE-FG02-92ER-40713.

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Date submitted: 28 Jun 2019

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