Abstract Submitted
for the HAW09 Meeting of
The American Physical Society

Direct jet reconstruction in $p+p$ and $\mathrm{Cu}+\mathrm{Cu}$ collisions with the PHENIX detector YUE SHI LAI, Columbia University, PHENIX COLLABORATION — Full jet measurements in heavy ion collision can elucidate the mechanisms responsible for in-medium parton energy loss and the response of the medium to the passage of a high-energy parton. However, at RHIC energies jets are difficult to measure in the presence of an large underlying background of soft hadrons. Jet reconstruction in such an environment requires an algorithm that is robust in the presence of such a background and efficiently suppresses fake jets resulting from possibly correlated fluctuations in that background. Efficient rejection of fake jets is especially important at RHIC energies due to the low rate for production of real jets at moderate to high p_T. We developed the Gaussian filter based jet reconstruction algorithm with a corresponding a fake rejection strategy, which is designed to be applicable both $p+p$ and heavy ion collisions. It both preserves the cone-like behavior found in many hadronic jet algorithms [1], while providing an acceptable fake rate in a background environment up to the central $\mathrm{Au}+\mathrm{Au}$ collision at RHIC energies. We present results of its application in both $p+p$ and $\mathrm{Cu}+\mathrm{Cu}$ collisions using data from the PHENIX detector, including jet spectra, jet–jet angular correlation, and the nuclear modification factor. We discuss the comparison and implication for models, and further outline our future program for jet physics using the PHENIX detector. [1] Y.-S. Lai and B.A. Cole, arXiv:0806.1499 (2008).

Yue Shi Lai
Columbia University

Date submitted: 01 Jul 2009 Electronic form version 1.4