Studies of the strong interaction in jet production in Run II at the Fermilab Tevatron collider

Of all high pT processes at a hadron collider, jet production is the process with the largest cross section. Therefore, jet production has the highest reach in momentum transfer and, correspondingly, probes the shortest distance scales. This makes jet production an ideal process to study the strong interaction in previously unexplored kinematic regions. Possible deviations from the predictions might point to physics processes beyond the Standard Model. In this presentation I give an overview of the jet results obtained in Run II of the Fermilab Tevatron collider, with emphasis on the concepts, methods, and the interpretations of the results. I discuss how the jet measurements can be used to test theoretical predictions, to rule out certain classes of ”new physics” models, and to provide information on the quark and gluon structure of the proton. The highlights include recent jet measurement results, which are used to determine the coupling constant of the strong interaction and to test its energy dependence in a new energy regime.