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First Measurement of $\sigma(gg \rightarrow t\bar{t})/\sigma(p\bar{p} \rightarrow t\bar{t})$ in $p\bar{p}$ collisions at $\sqrt{s} = 1.96$ TeV¹ SHABNAZ PASHAPOUR, University of Toronto — According to the standard model, $t\bar{t}$ can be produced through gluon-gluon fusion or quark-antiquark annihilation. We will present the first measurement of $\sigma(gg \rightarrow t\bar{t})/\sigma(p\bar{p} \rightarrow t\bar{t})$. This analysis uses about 1 fb^{-1} of data collected by Collider Detector at Fermilab (CDF) at $\sqrt{s} = 1.96$ TeV to find $t\bar{t}$ candidates in lepton+jets channel. The measurement provides a test of the QCD predictions for this pair-production mechanism, and a technique to test for unexpected sources of top quark production. We take advantage of the correlation between the average low P_T track multiplicity and the average number of gluons participating in the high-energy interaction. Using W boson and dijet calibration samples, we define largely no-gluon and gluon-rich samples, respectively, and use the observed track multiplicities to measure the fraction of $t\bar{t}$ events that are produced in gluon-rich interactions.

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