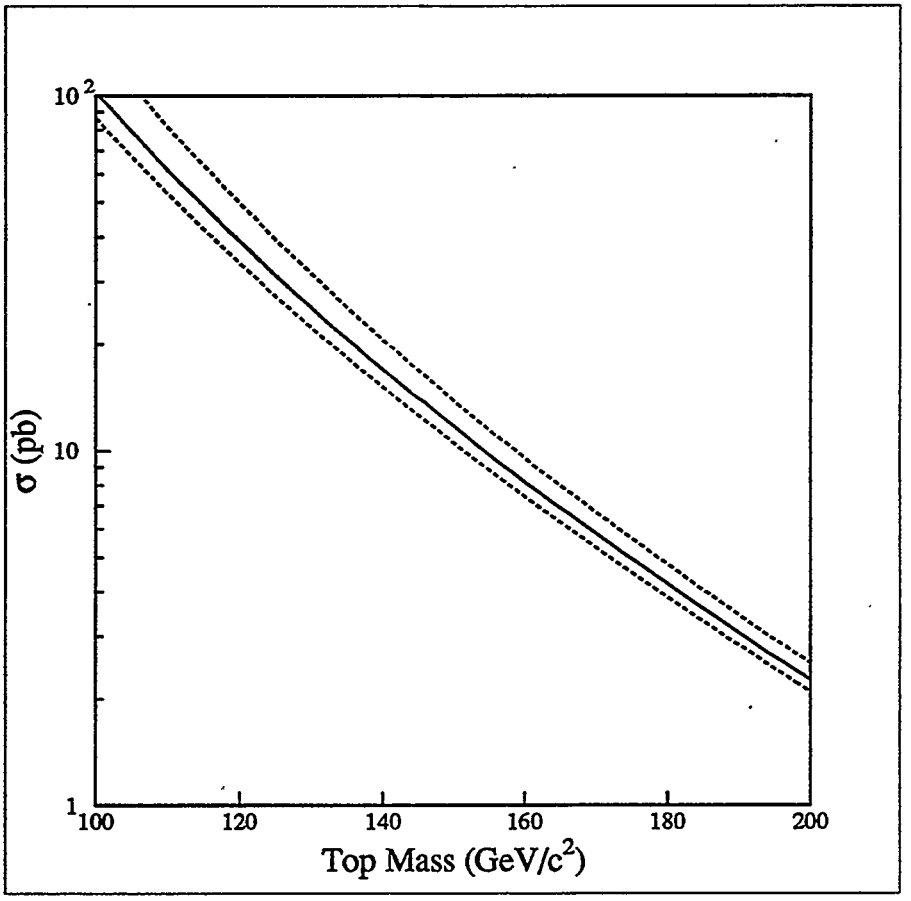

Figure 1: The total cross section for top quark production in 1.8 TeV $p\bar{p}$ collisions. The upper and lower curves are a measure of the theoretical uncertainties in the calculation.

relatively long tail. The pseudorapidity distribution for top quarks is peaked at 0 and falls off rapidly so that most of the top quarks are produced in the "central" region with pseudorapidity $|\eta| < 2$. The combination of a relatively energetic heavy quark produced centrally is ideal from an experimental point of view. The top quark decay products are rather stiff and central, aiding their detection.

The standard model predicts that the top quark will decay almost always via $t \rightarrow W^+b$. The W decays approximately 2/3 of the time into $q\bar{q}'$ pairs ($u\bar{d}$ or $c\bar{s}$) and 1/3 of the time into one of the three lepton generations. This results in a decay topology consisting of 6 energetic partons that could either be charged or neutral leptons, or quark jets.

The decay channels involving τ leptons are problematic given the difficulty of cleanly identifying these weakly decaying leptons in a hadron collider environment. They have therefore not been explicitly included in the searches I describe below. The

transverse variables such as transverse momentum (P_T) and transverse energy (E_T) are defined relative to this axis. The angle ϕ represents the azimuthal angle about the beam axis and the angle θ represents the polar angle relative to the beam axis. Pseudorapidity $\eta \equiv -\ln\tan(\theta/2)$ will often be employed instead of θ.