

Exercises, part 6

Thursday 2003-11-20 - Thursday 2003-11-27 16:00

1. top discovery

10 points

Read the paper

F. Abe et al. (CDF collaboration), Phys. Rev. Lett. 73 (1994) 225, 'Evidence for Top Quark Production in $\bar{p}p$ Collisions at $\sqrt{s} = 1.8 \text{ TeV}$ '.

i) Please answer the following questions:

- a) Estimate the branching fraction $BR(t \rightarrow W s)$.
- b) How is it possible to determine the top mass from electroweak measurements ($177 \text{ GeV} \pm \dots$) ?
- c) How can one produce a single top quark in $\bar{p}p$ collisions ?
- d) Do you understand the probabilities for the different final states (**5%, 30%, 65%**) ?
- e) Compare the measured cross sections with newer results from the same experiment.
- f) Explain which events types are in the samples labeled 'Dilepton', 'SVX' and 'SLT'.
- g) Why does the 'W + jets' analysis play such an important role ?
- h) Why is the observed number of 'Z + jets' events a problem ?

ii) Ask yourself two questions related to the paper!