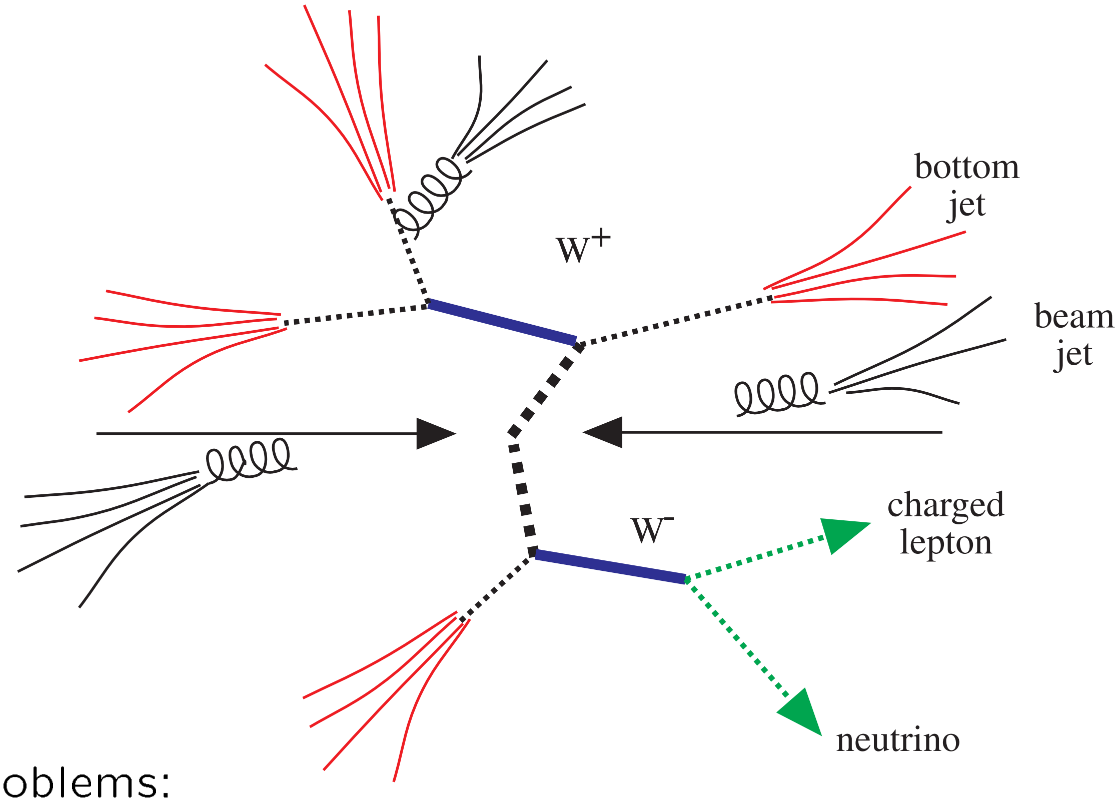
Lepton + Jets Reconstruction

In this mode, have measured almost all $t\,\bar{t}$ daughters

- Lepton 4-momentum solid and ν_l is missing only p_z
- $W \to q\bar{q}'$ observed as 2 jets
- bottom quarks observed as jets (perhaps tagged)



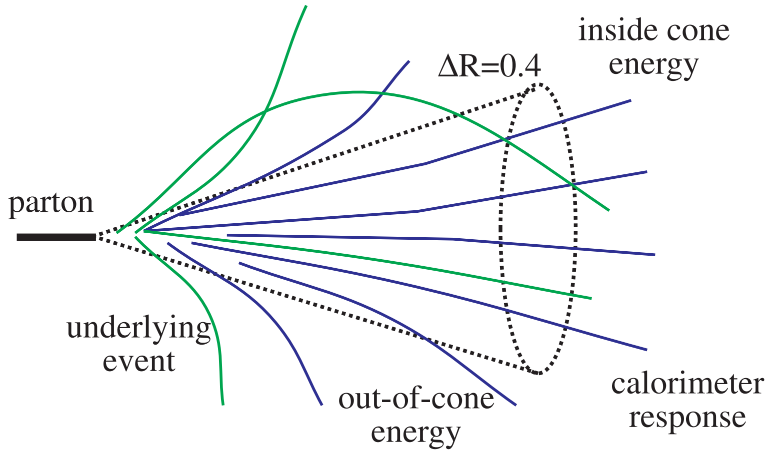
Problems:

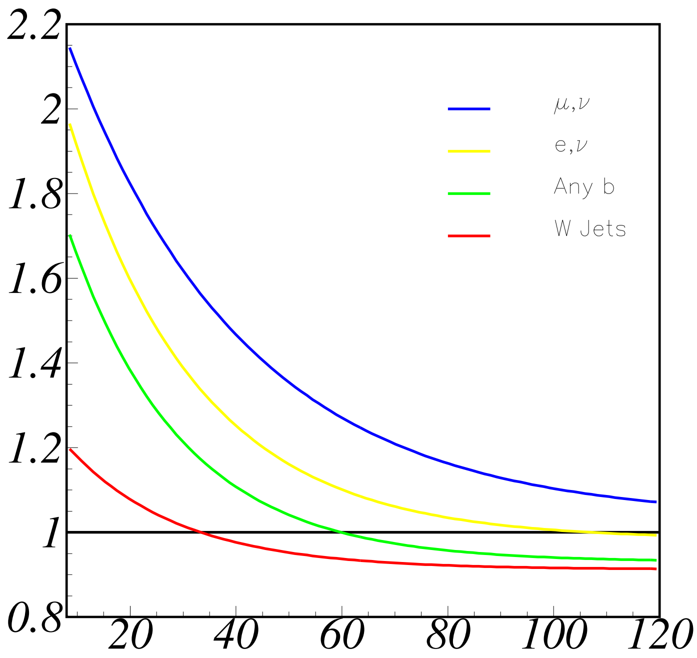
- QCD radiation generates additional jets
- Combinatorics in identifying jets $\leftrightarrow$ partons
- Background events

Jet-Parton Corrections

Have to first correct observed E_T to parton E_T

- Corrections determined by MC and testbeam studies
- Make additional corrections for $t\bar{t}$ topology





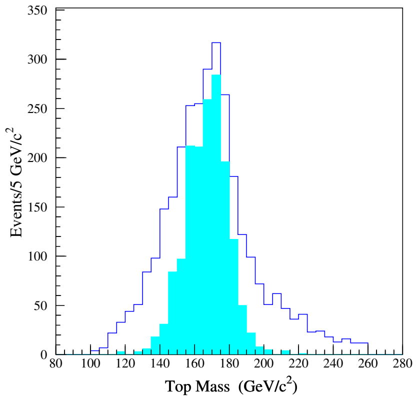
Tests of CDF Reconstruction

Can test how well procedure works with MC events

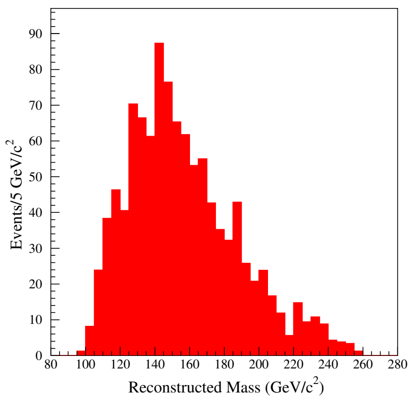
- Look at correct and "best" assignments
- Also look at how background would reconstruct

Mass Reconstruction for Top and W+jets Monte Carlo

Reconstructed mass for HERWIG MonteCarlo, M_{top} = 170 GeV



Reconstructed mass for the VECBOS+HERPRT W+3 jets events.

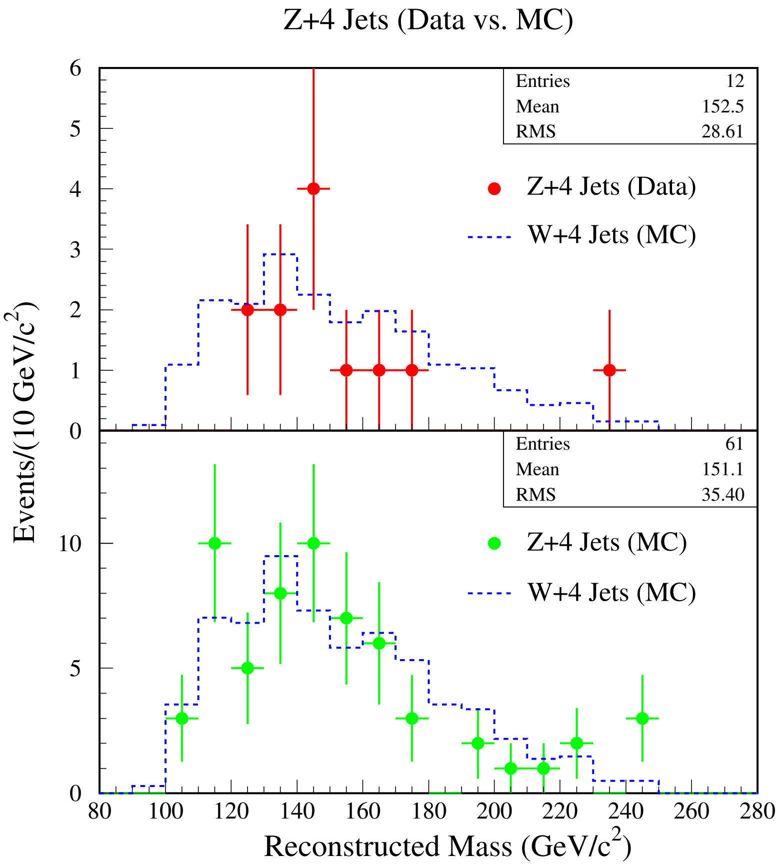


Background Effects

Primary backgrounds are from $Wb\bar{b}$ and fake leptons

- Use background rates from counting experiments
- Can check $Wb\bar{b}$ shape by looking at $Z+$ jets
- Use "non-isolated" lepton + jet sample for fakes
- Look identical to VECBOS $W+$ jets prediction

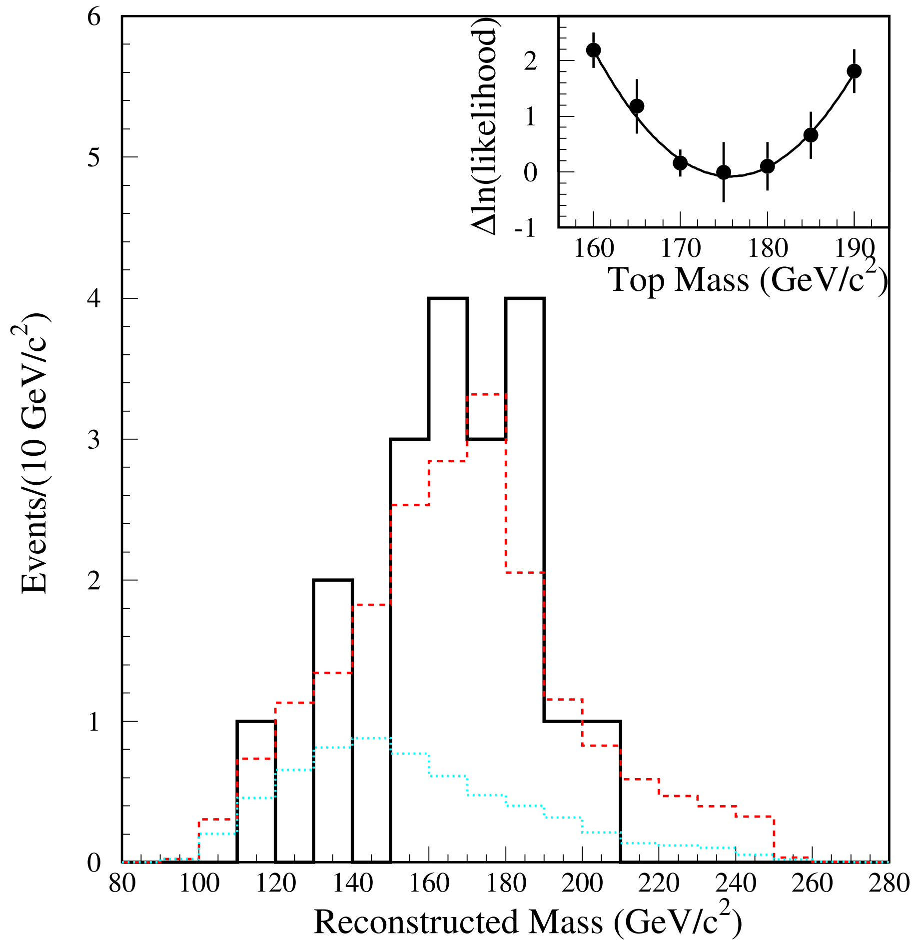
  $\Rightarrow$ Use VECBOS $W+$ jets MC for bkg shape



CDF Mass Results

Estimate background based on W+jet sample

- Use known fake tag rates and $Wb\bar{b}$
- Background shape in M_{top} comes from MC calculation
- Estimate background to be $6.9^{+3.4}_{-2.4}$ events
  - Primarily QCD W+jet



$$M_{\text{top}} = 176 \pm 8 \pm 10 \quad \text{GeV/c}^2$$

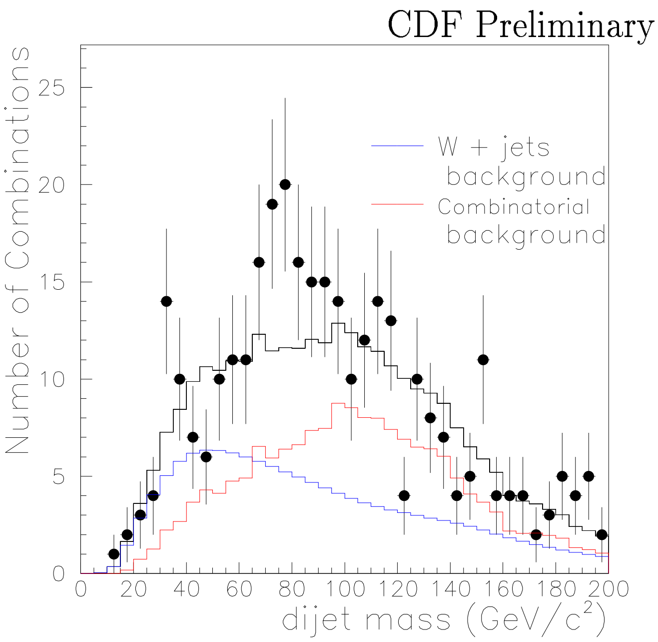
Evidence for $W \to q\bar{q}$

Observation of $W \to q\bar{q}$ is important

- Strong evidence of signal in $W^+W^-b\bar{b}$ channel
- Can calibrate jet energy scale

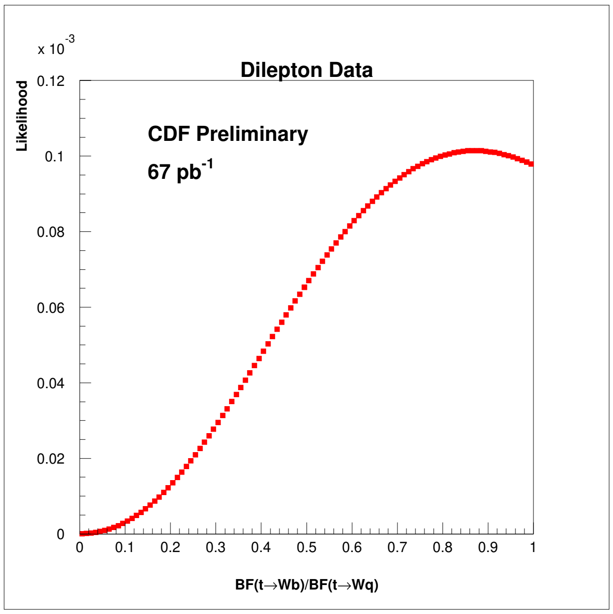
Have to refit data relaxing W mass constraint

- Look for W signal plotting all mass combinations
  - Makes it tough since 6 combos/event
- Reduce backgrounds by requiring $H > 300$ GeV

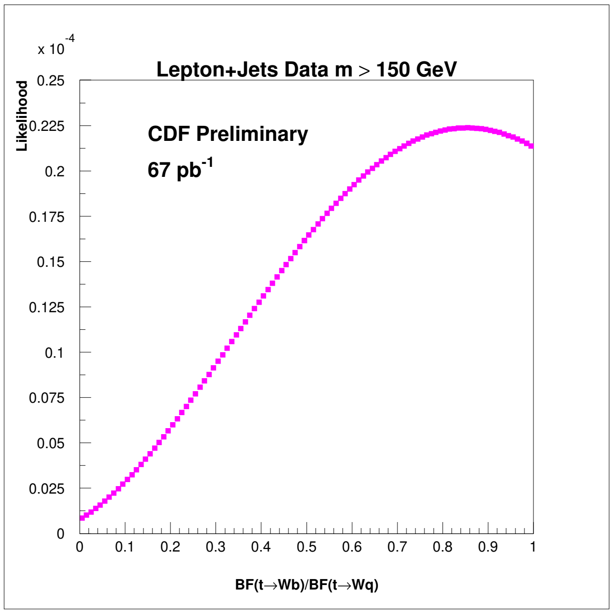


CDF BR Results

Result from dilepton data is $\mathcal{R} = 0.875 \pm 0.4$



Result from lepton + jets data is $\mathcal{R} = 0.87 \pm 0.3$



$t\bar{t}$ Invariant Mass

Data is statistics limited

- There is no apparent enhancement
- An upper limit on Top-Color Z' mass and cross section coming soon