Top Topics

- **Improve modeling of W+jets, Z+jets, WW+jets, ttbar+jets with comparison of new approaches to Tevatron data**
  - **LO ME+PS**
  - **MC@NLO**

  Shared interest between with QCD & Higgs
  Important for background estimates at LHC

- **Try methods for precise jet energy scale for top mass**
  - **Hadronic W**
  - **b-jet energy scale**

- **Try to use LHC physics analysis tools**
  - **Experience of commissioning in CDF/D0**
  - **Transfer skills and knowledge to LHC**

MC modeling

- **Improve modeling of W+jets, Z+jets, WW+jets, ttbar+jets**
  - **Test matching ME+PS in several ways with data**
    - **Public StdHep files with MADGRAPH+PYTHIA (S. Mrenna)**
    - **MLM matching scheme with CDF/D0 implementation**
    - **SHERPA from Frank Krauss**
    - **ALPGEN new version from Michelangelo Mangano**
  - **Reduced Q^2 scale dependence?**
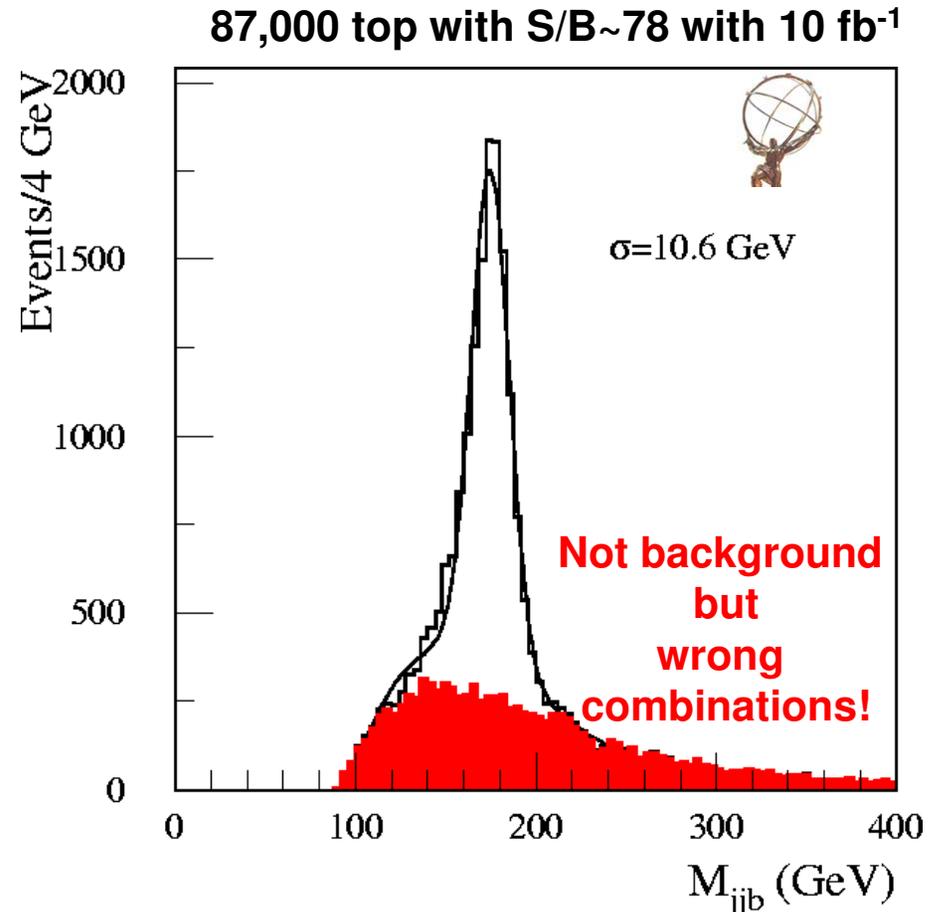 - **Closer to NLO kinematics?**

B. Cooper
F. Krauss
S. Mrenna
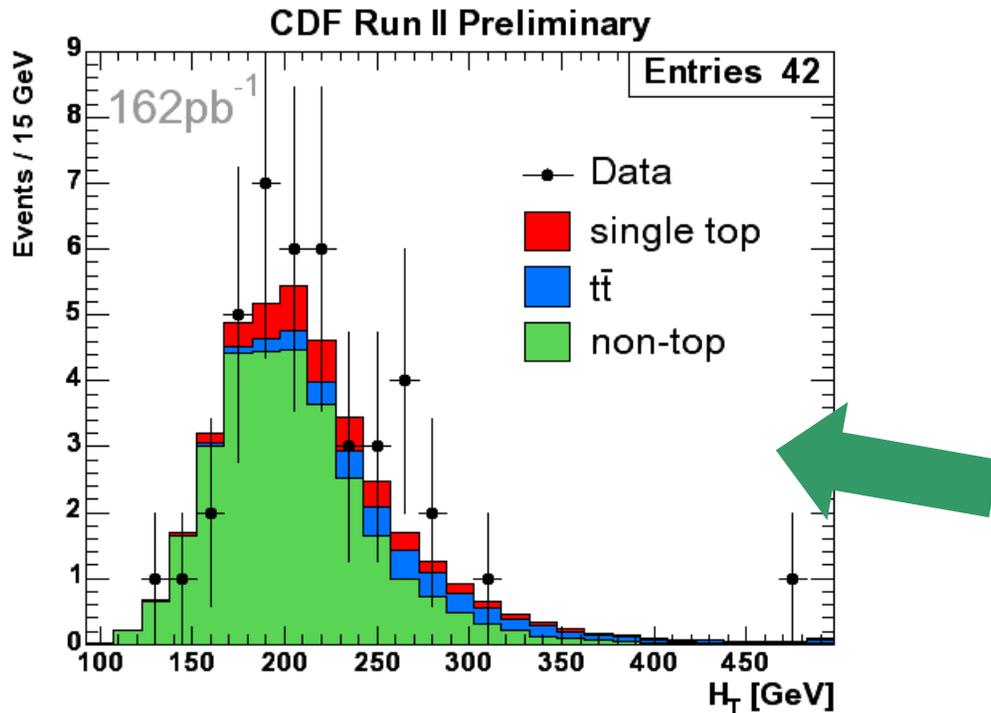M. Zielinski
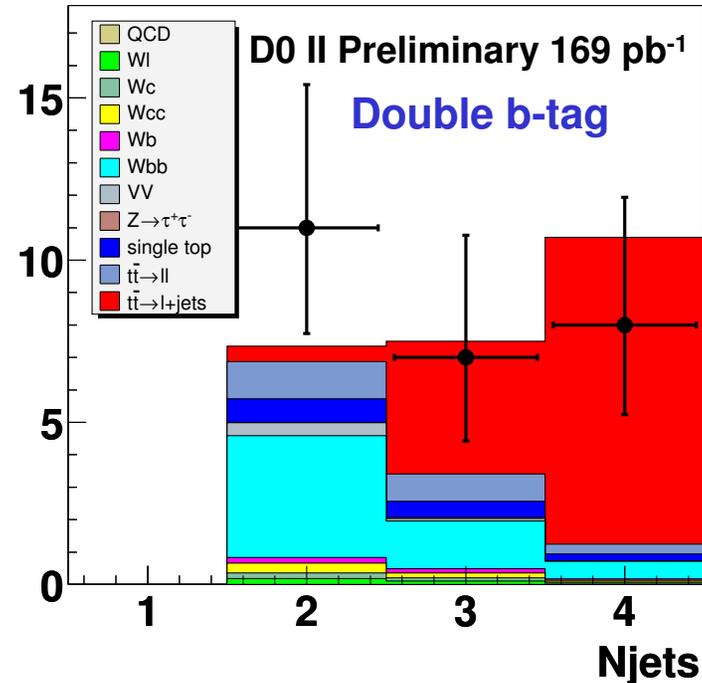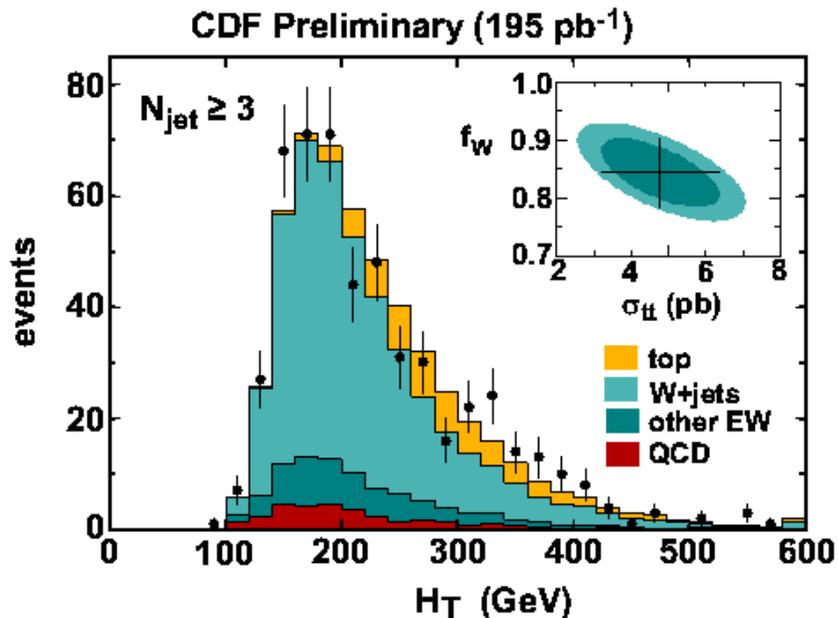
Top mass @ LHC

- **Calibrate jet energy scale *in situ* using hadronic W decay**
  - **Test global scale and systematics at Tevatron**
- **b-jets – can achieve 1% calibration with Z+b**
  - **Test systematics with Z+jet at Tevatron**
- **Test new techniques**

87,000 top with S/B~78 with 10 fb^{-1}

Source of uncertainty	Hadronic δM_{top} (GeV)	Fitted δM_{top} (GeV)
Light jet scale	0.2	0.2
b-jet scale	0.7	0.7
b-quark fragmentation	0.1	0.1
ISR	0.1	0.1
FSR	1.0	0.5
Combinatorial bkg	0.1	0.1
Total	1.3	0.9
Stat	0.1	0.1

σ=10.6 GeV

Not background but wrong combinations!

Events/4 GeV

M_{jjb} (GeV)

SN-ATLAS-2004-040

Search for Single Top

CDF Run II Preliminary

Entries 42

162pb⁻¹

- Data
- single top
- t̄t
- non-top

F. Rizatdinova

- **Test NLO calculations for rate and shape**
  - **Single top**
  - **Wbb**
  - **Wjj**
- **Benefit from lots of recent theory developments**

H_T Shape for Non-top Background (W+2Jets)

- Mistags
- Wb$\bar{b}$
- Wc$\bar{c}$
- Wc
- Di-Boson
- non-W

- **Improve b-tagging**
  - **Higher efficiency**
  - **Reject charm**
- **Test discovery techniques**
  - **Neural Network, Matrix Element**
  - **Possible to find s-channel at LHC?**

R. Schwienhorst