Recent CDF & DØ Results

Gregorio Bernardi
on behalf of the CDF and DØ collaborations

- **QCD**
- **ElectroWeak**
- **New Phenomena**
- **Top (Higgs)**

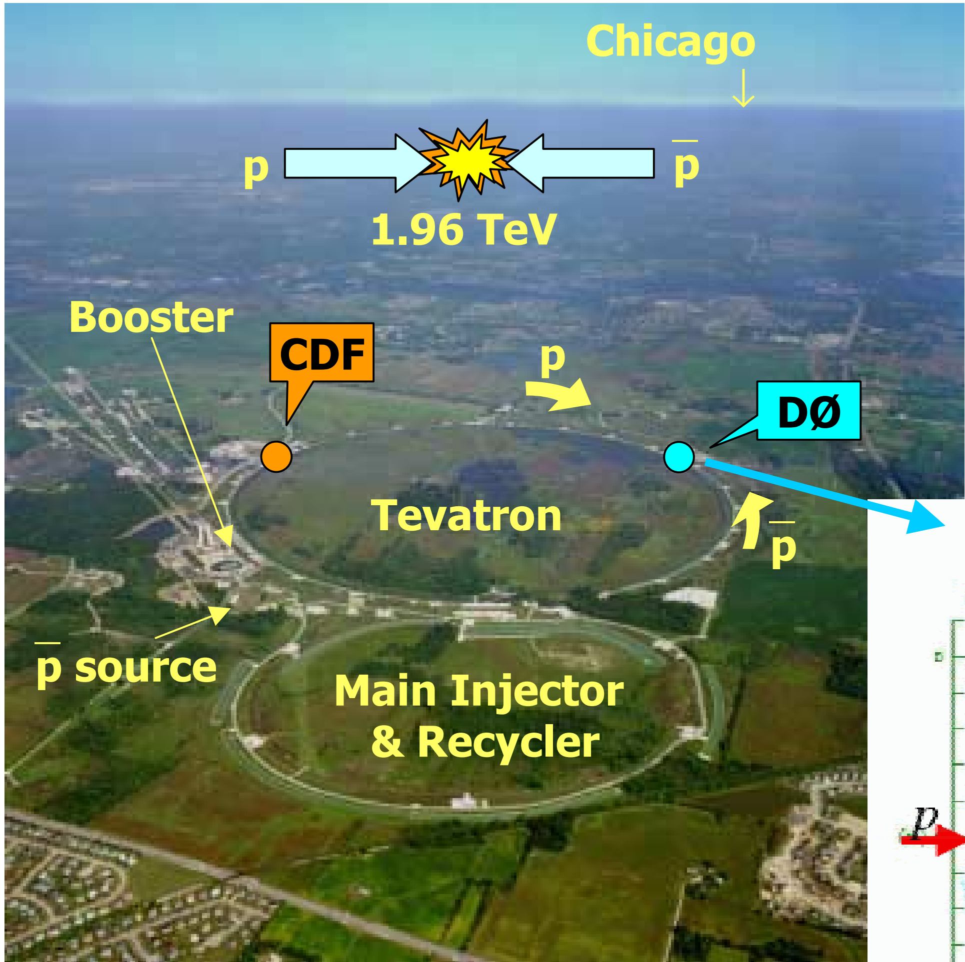
Many thanks to my cdf and d0 colleagues when assembling this talk, in particular to P. Azzi, B. Hiroski, B. Kehoe, M. Schmitt, N. Varelas & T. Wyatt.

Tevatron Collaborations

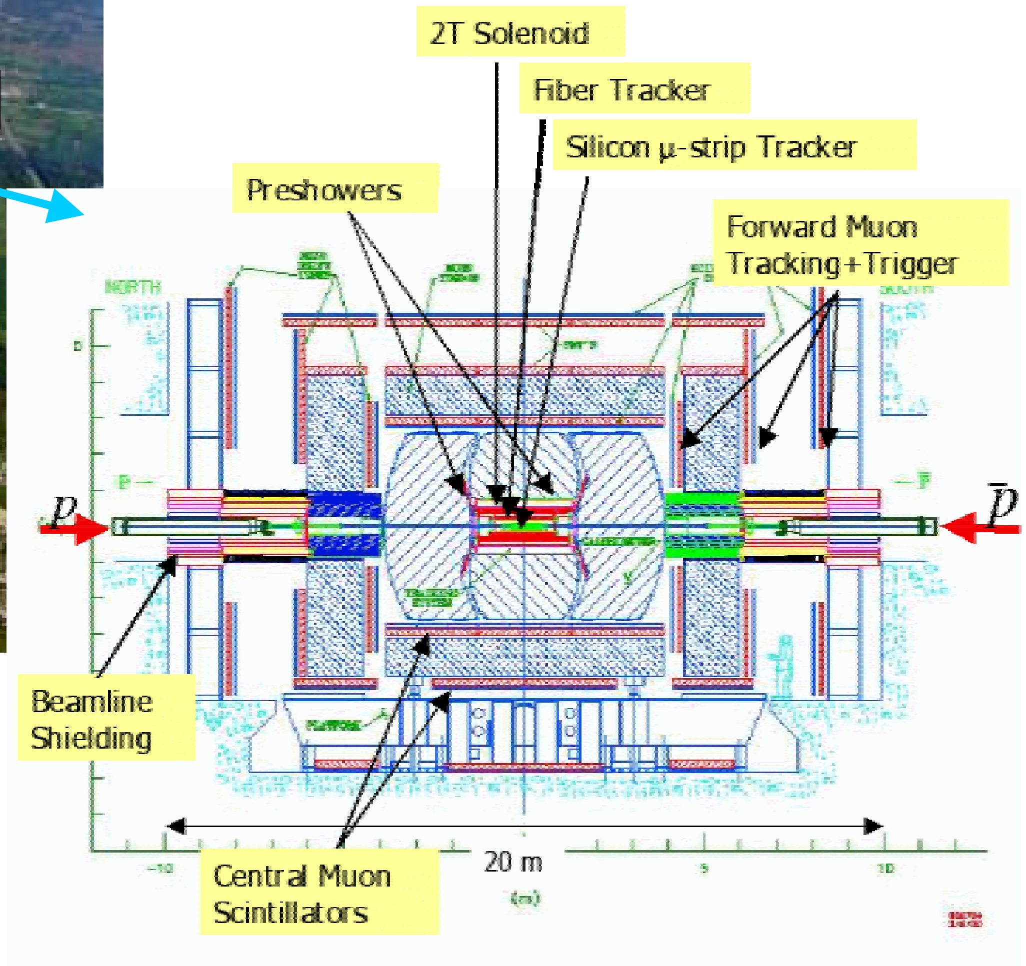
12 countries, 62 institutions
767 physicist

19 countries
83 institutions, 664 physicists

DØ at Fermilab TeVatron-RunII

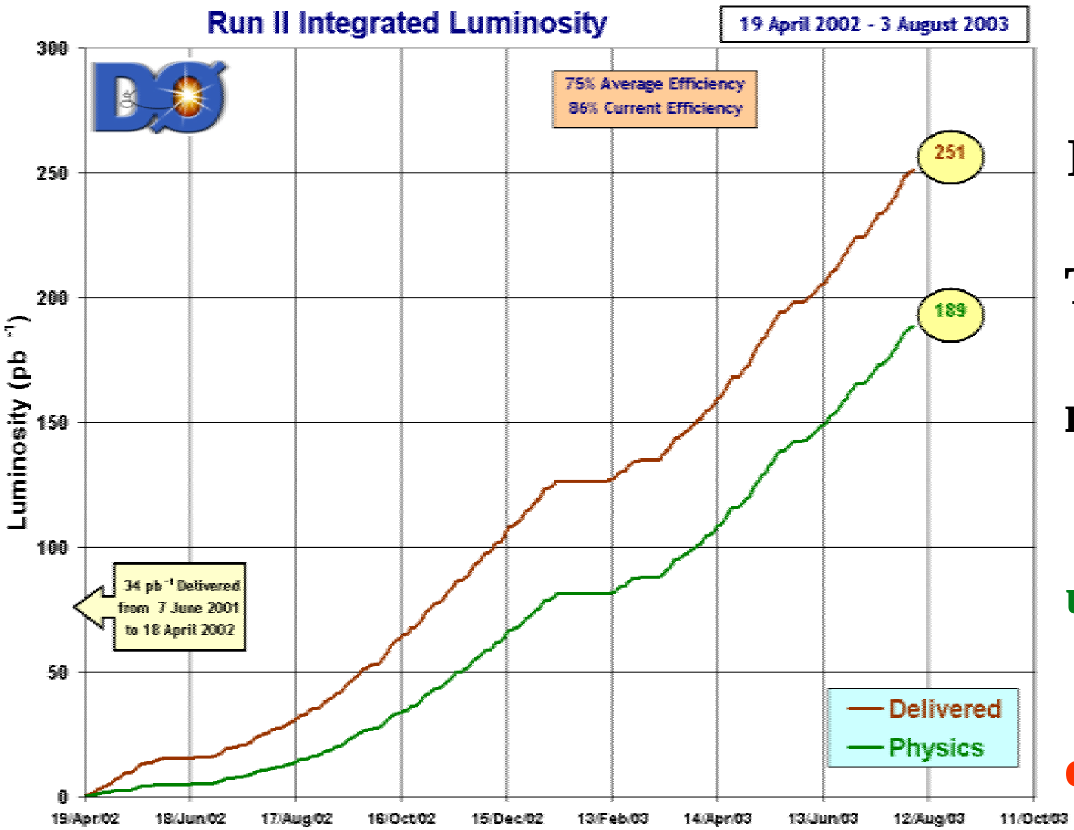


DØ Upgrade:
Silicon, fiber tracker,solenoid, muon, daq, trigger, electronics



Gregorio Bernardi, LPNHE Paris, DØ

Run II data taking→ Lepton-Photon



New c.o.m energy: 1.96 TeV

Tevatron delivered: > 250 pb^{-1}

recorded with full detector: > 190 pb^{-1}

up to 135 pb^{-1} used in current analyses

current operating efficiency: ~90%

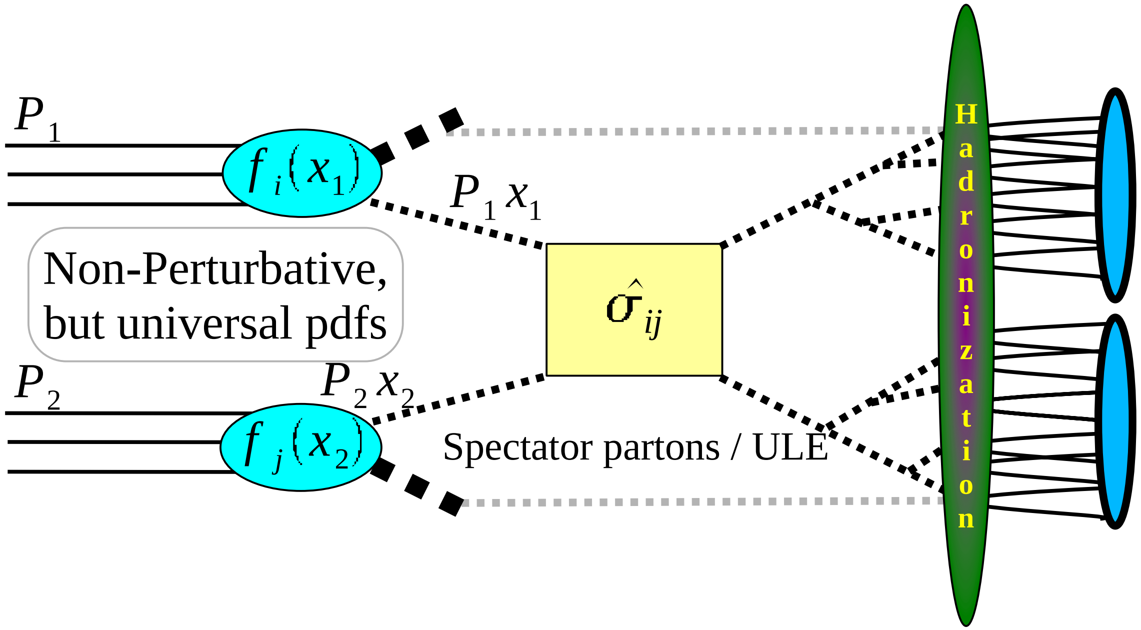
- **exceeded Run I Lumi**
  - **large fraction analyzed**
  - **some analyses more sensitive than Run I**

<u>Next Year projection:</u>
additional 310÷380pb^{-1} delivered

Hard Interactions in QCD

General applicability of perturbation theory

- **non abelian gauge theory, running coupling constant** $\alpha_s \propto \frac{1}{\ln(\sim Q^2/\Lambda^2)} - \ldots$
- **rich phenomenology**
- **short distances / large p scales:** α_s **small allowing perturbative calculations**
- **factorization of short (pert.) and long (non- pert.) scales**



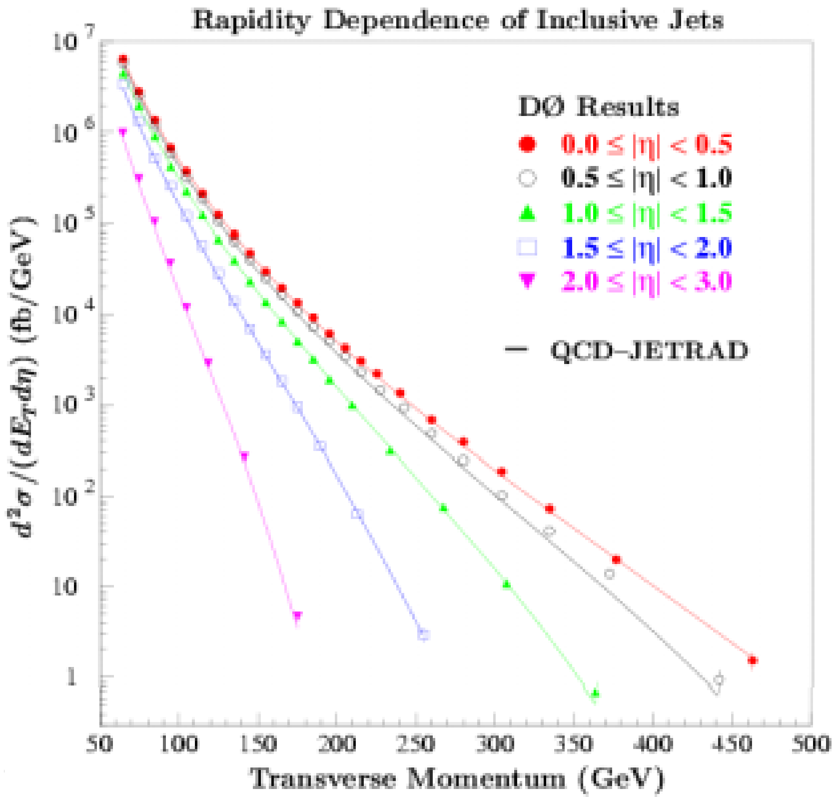
Calculable at (N)NLO with scale dependencies: $\alpha_s(Q^2)$, $f(x, Q^2)$

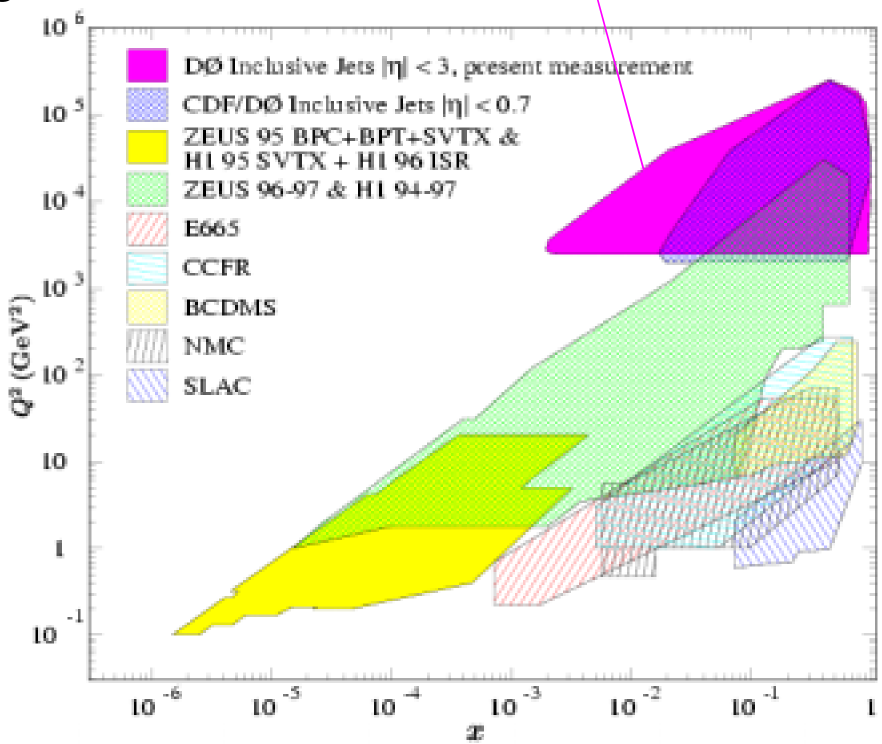
Inclusive Jets: Kinematic range

Cross section for single inclusive jets probes the hard interaction vertex over many decades in momentum exchange

- **probes for deviations from pQCD at small distance scales**
- **sensitive to pdfs and running of alpha_s**

DØ Jets |η| < 3.0

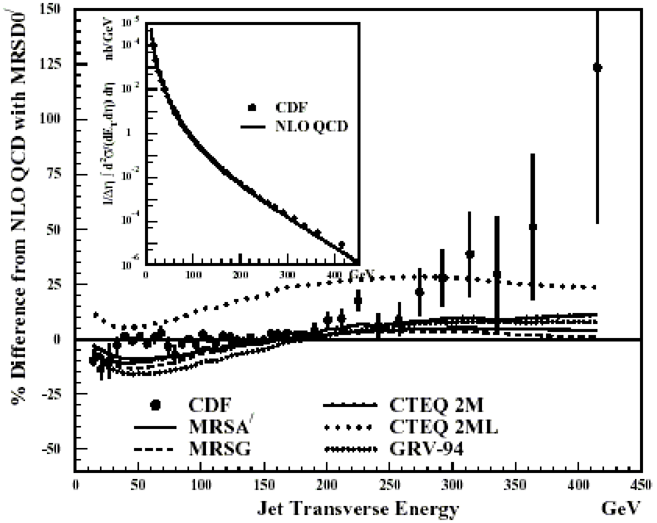




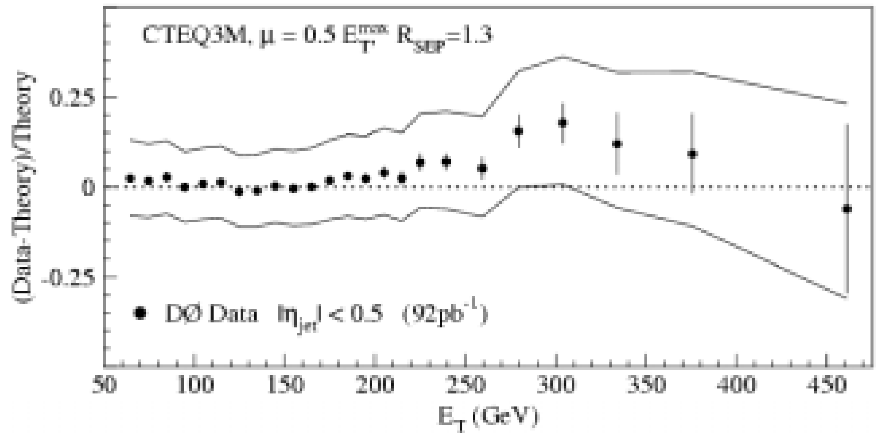
DØ Run I Jets PRL 86, 1707 (2001)

Inclusive Jets (Reminder of Run I Results)

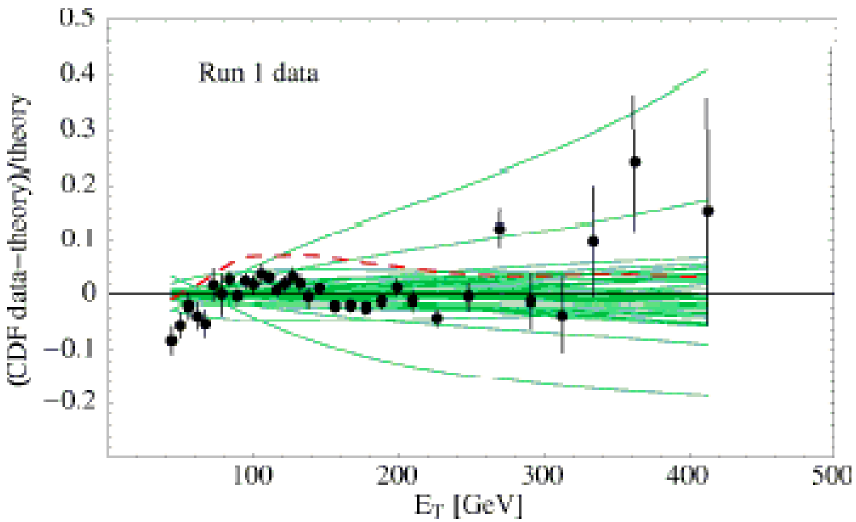
Initially, some excitement over CDF's apparent excess cross section, but...



...NLO QCD showed good agreement @ DØ



CTEQ 6 fit ranges vs CDF Run I data (large-x gluons poorly constrained in present fits)



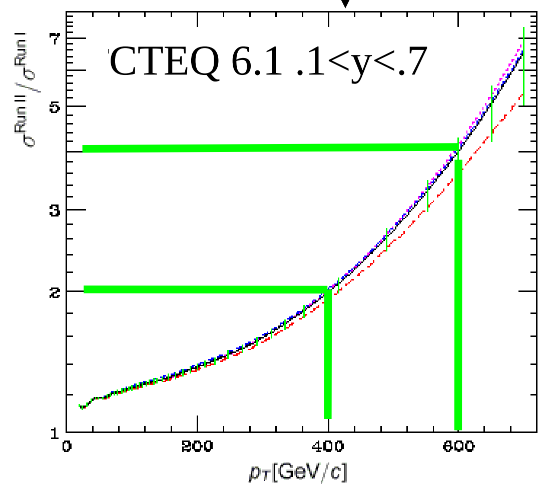
- **QCD is tested at the Tevatron in a unique domain, important input to pdfs determination**

- **strong push for quantified pdf uncertainties**

...not only important for QCD

Inclusive Jets in Run II

$\sigma_{runII}/\sigma_{RunI}$



Run II statistics expectations:

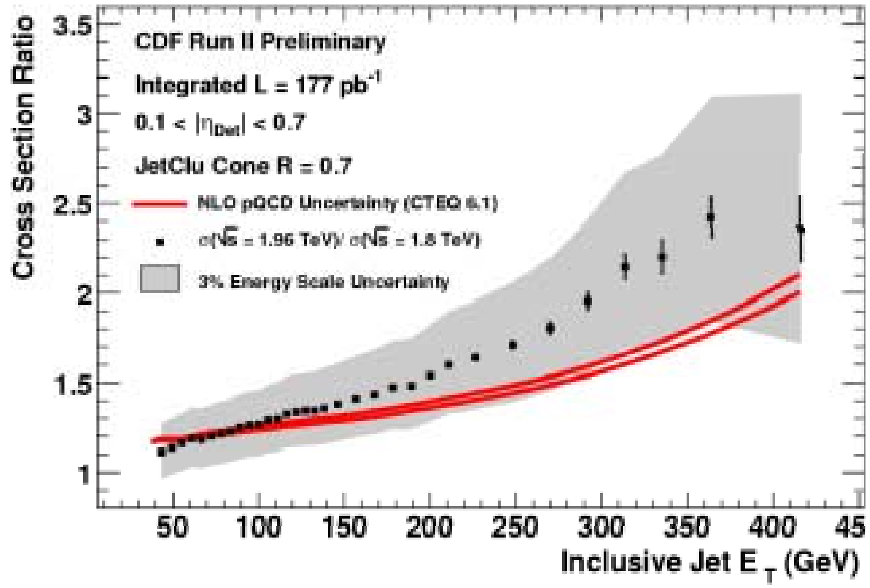
versus Run I (higher sqrt(*s*): 1.8 ? 1.96 TeV)
cross section : x2 @ *ET* = 400GeV
x4 @ *ET* = 600GeV

Extend measured E_T spectrum to > 600GeV
In the 1st phase of Run II
(integrated luminosity of ~2 fb^{-1})

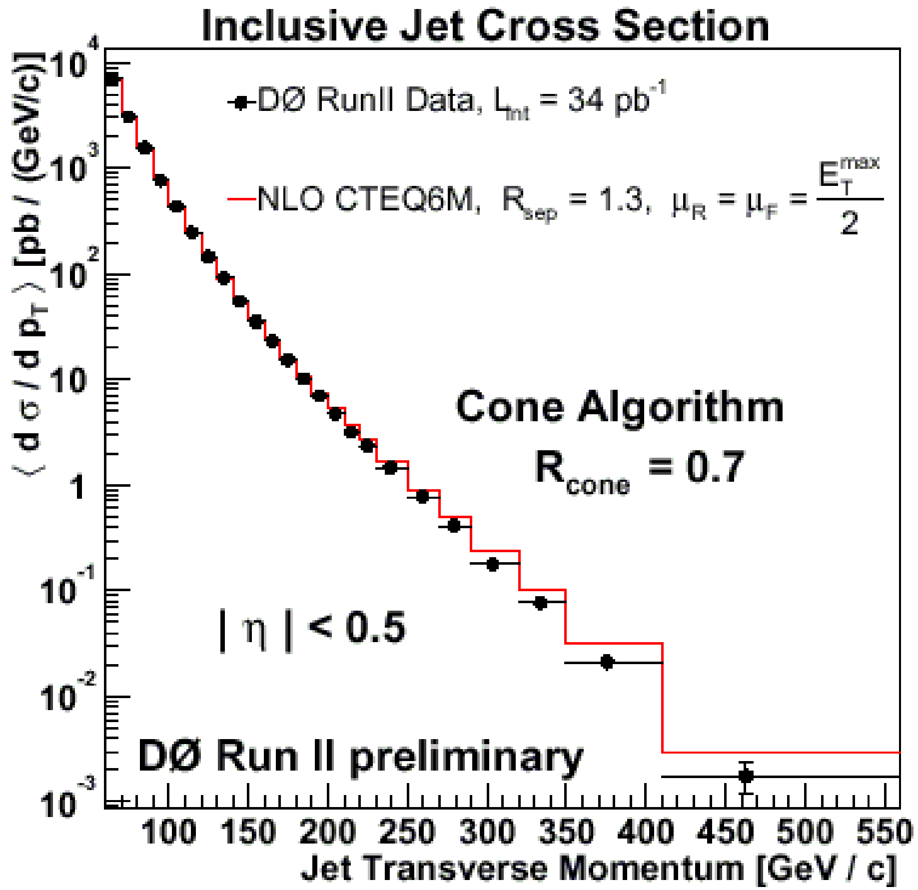
Few percent statistical error in previously limiting bin

~2x Run I luminosity now collected at CDF/ DØ. Subsets of these data are presented here.

CDF RUN II / RUN I

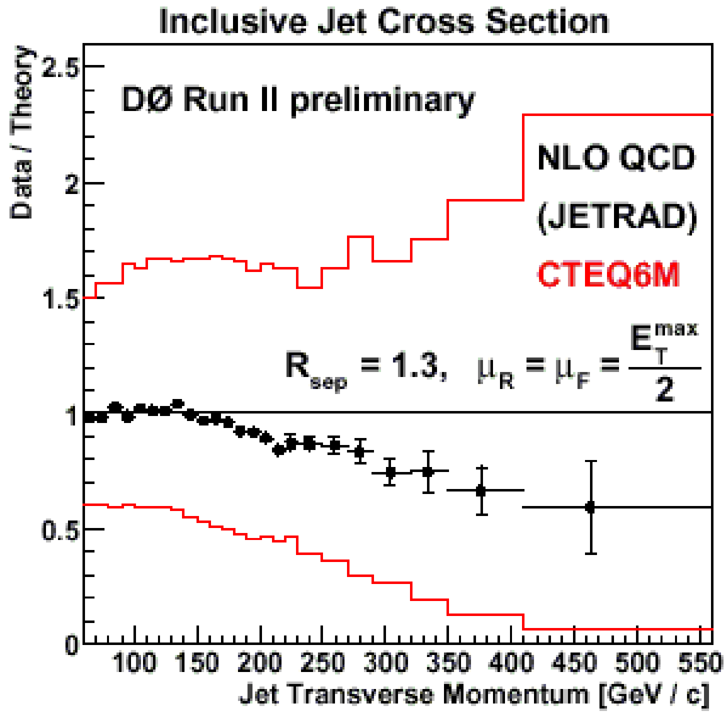


Inclusive Jet Cross Section



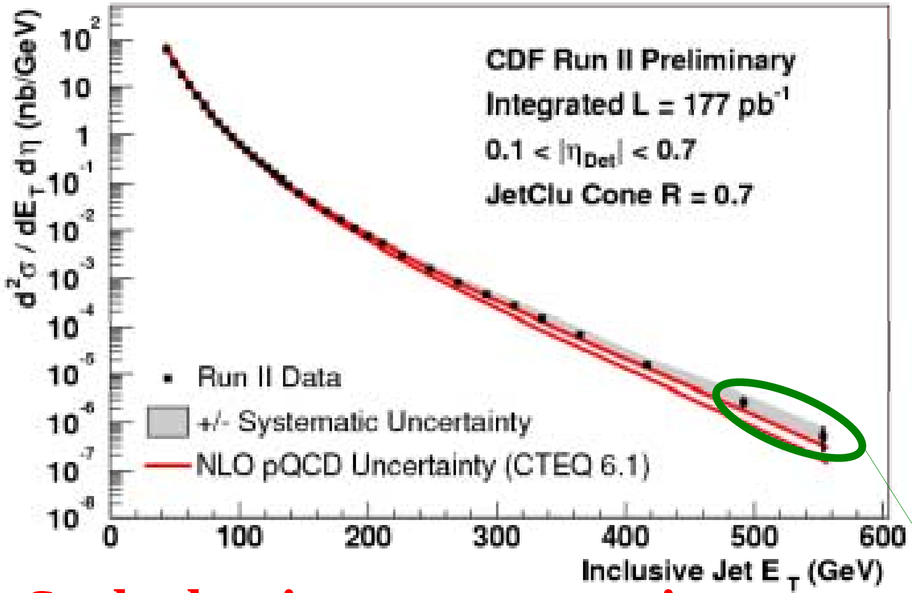
Central |η| < 0.5 inclusive jets
R=0.7 RunII cone algorithm*
$\mathcal{L}$= 34 pb-1

Energy Scale: correct back to hadron level
Full new derivation from Run II data



Scale dominates systematics – will become smaller with integrated luminosity and further syst. studies
±~10% normalization

Inclusive Jet Cross Section



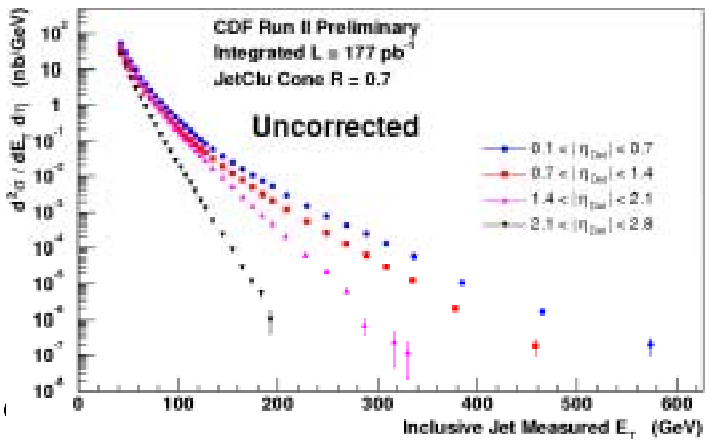
Central 0.1<|η|<0.7 inclusive jets
R=0.7 Run I cone algorithm
$\mathcal{L}$= 177 pb-1

Overall Escale normalized to Run 1
(with 5% ± 3% correction factor)
Reapply PT-dependent systematics from Run I

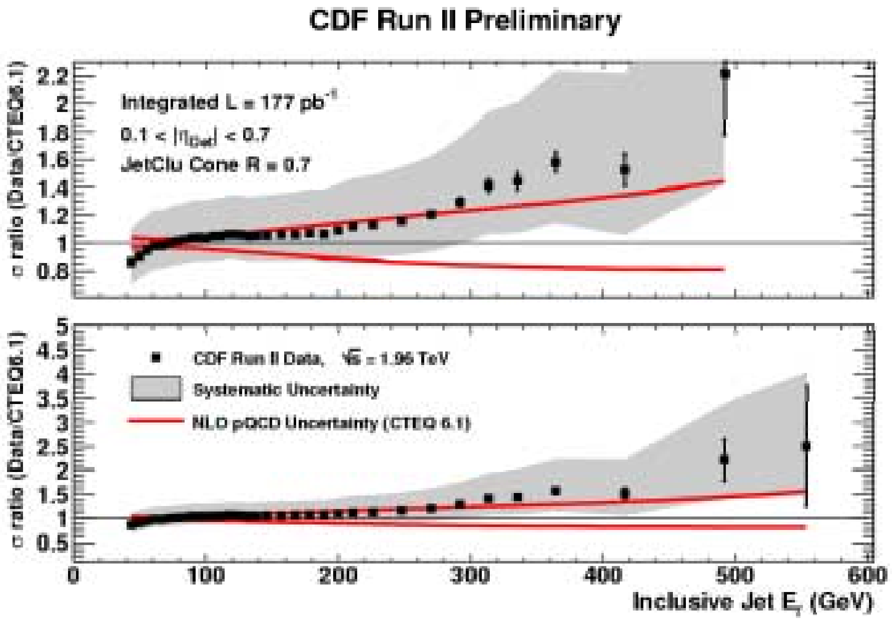
Extended wrt Run I by 150 GeV!

Scale dominates systematics
±~6% normalization

Preliminary distributions for |η| < 2.



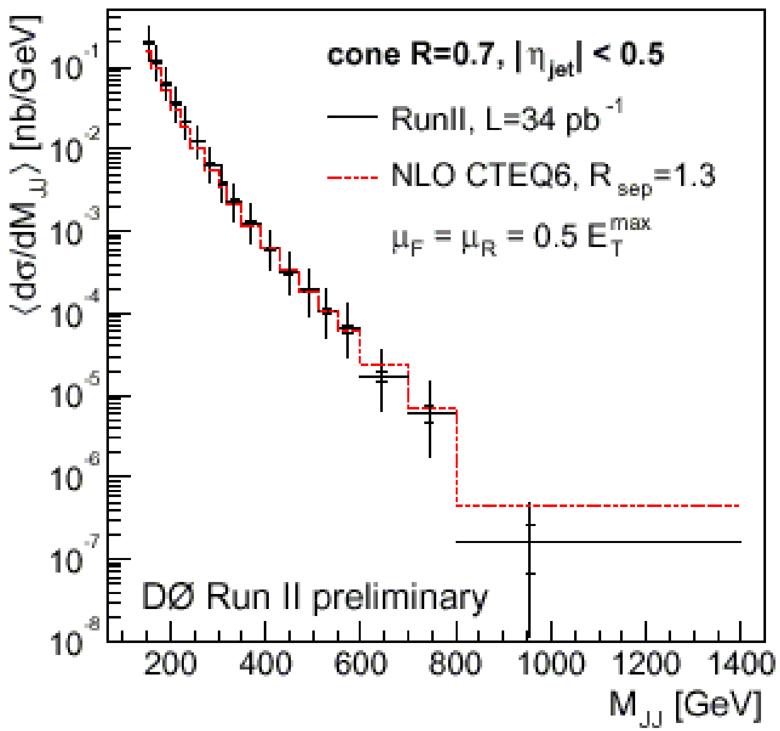
uncorrected

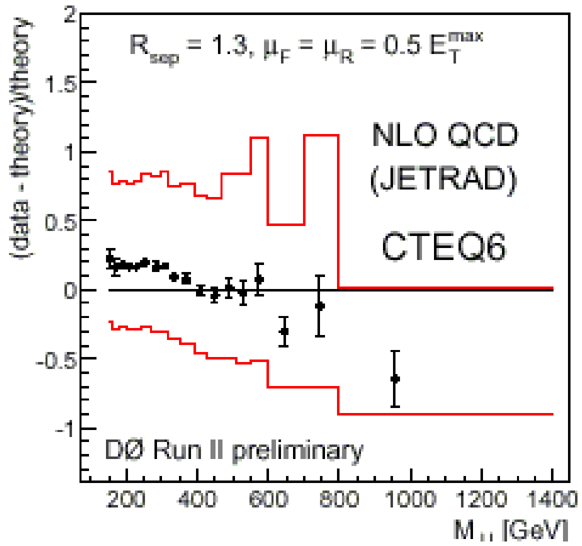


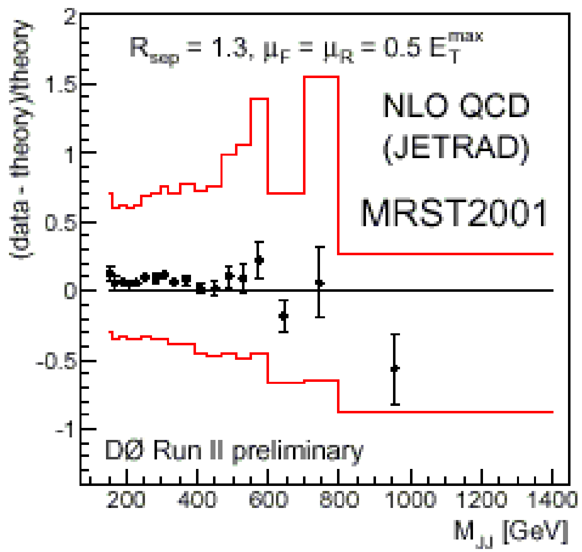
Dijet Mass Spectrum $\frac{d^2\sigma}{dM_{jj}\,d\eta}$

Central $|\eta| < 0.5$ jets

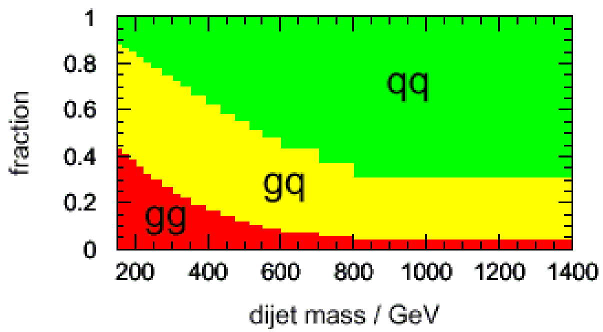
$\mathcal{L}$= 34 pb^{-1}





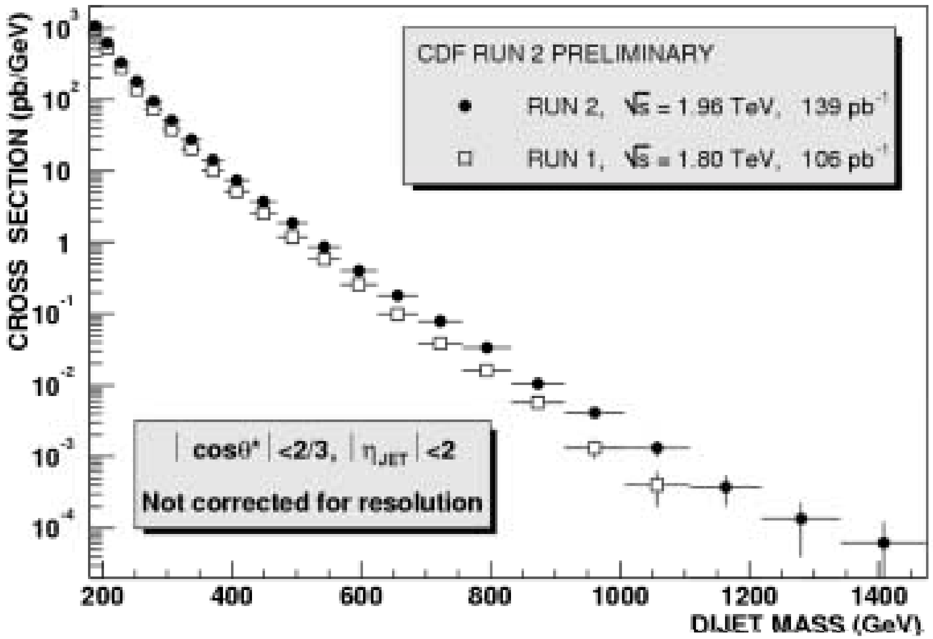


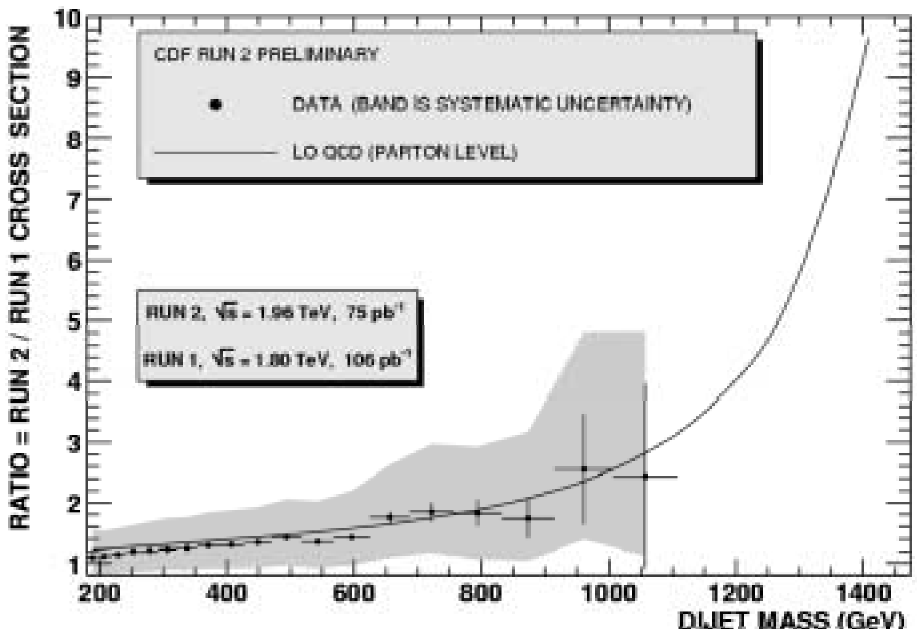
Highest limits in Run I for compositeness from this analysis



Also good sensitivity to gluons at large-x

Dijet Mass Spectrum

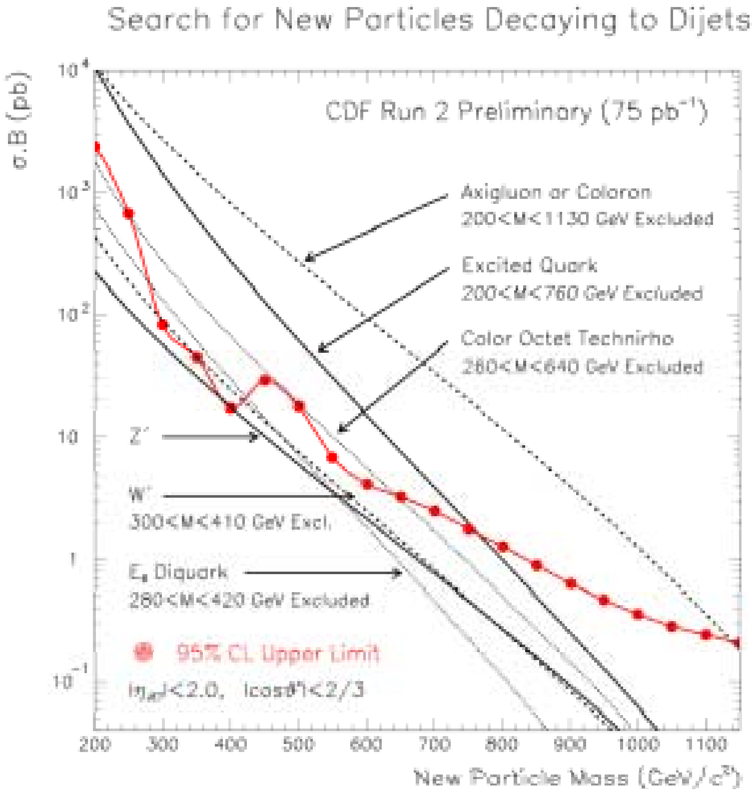




Larger Run II data sample $\mathcal{L}$= 139 pb^{-1}

Preliminary Run II limits set in "bump hunt" for resonances in 2-jet mass in $\mathcal{L}$= 75 pb^{-1} sample.

➔Already reaching comparable or higher limits than in Run 1



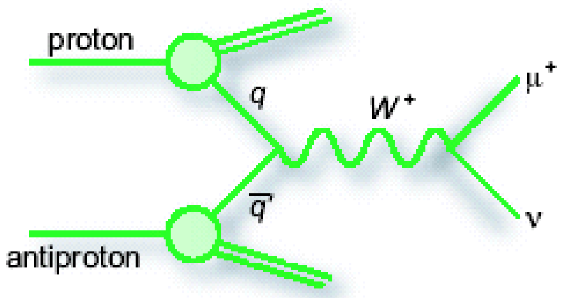
W – Z Physics

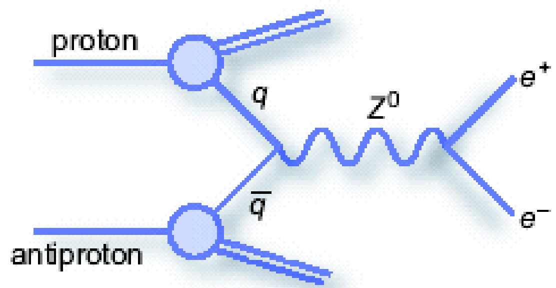
- EW Results:
  - $\sigma \times$ B for W & Z
    - e/μ channels
  - Ratio of W/Z Production Cross Sections
  - Combined Tevatron Results
    - Run II W width
- Other measurements with W and Z
- Di-boson production

W's and Z's at the Tevatron

- **Production dominated by $q\bar{q}$ "annihilation"**
  - **Run II will have >10^6 W's & >10^5 Z's**

$W \to l\nu \Rightarrow$ ~1 Hz @ L = 2×10^{32}



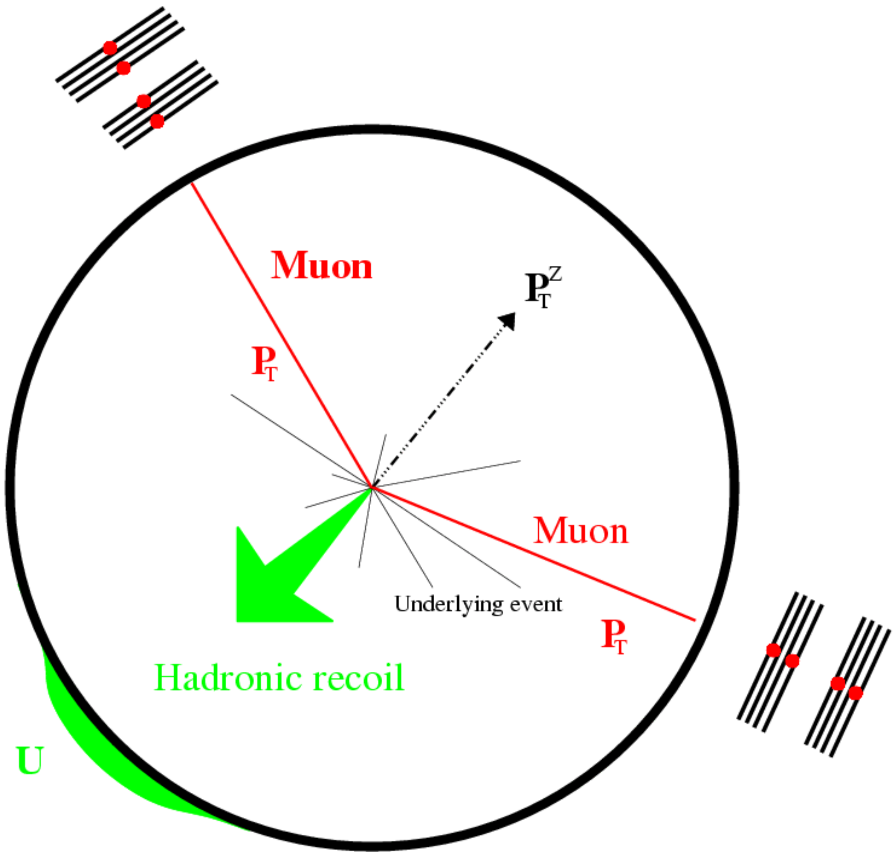


- **Use leptonic decays of W and Z**
  - **Avoids large $p\bar{p} \to jj$ contamination**
  - **BR ~11% per mode for $W \to \ell\nu$**
  - **BR ~3% per mode for $Z \to \ell\bar{\ell}$**
  - **Clean, low background, event signatures**
    - **High p_T isolated leptons**
    - **W: 1 high p_T lepton + missing E_T (from ν)**
    - **Z: 2 high p_T leptons**

$$\sigma\left(p\bar{p} \to W + X \to \ell\nu + X\right) \approx 2.8\ \text{nb}$$
$$\sigma\left(p\bar{p} \to Z + X \to \ell\bar{\ell} + X\right) \approx 0.26\ \text{nb}$$

Cross Sections increase by ~10% from 1.8 to 1.96 TeV

Experimental Signature: Z? l^+l^-



- **pair of charged leptons:**
  - **high p_T**
  - **isolated**
  - **opposite-charge**

- **redundancy in trigger and offline selection**
- **low backgrounds**
- **control of systematics**

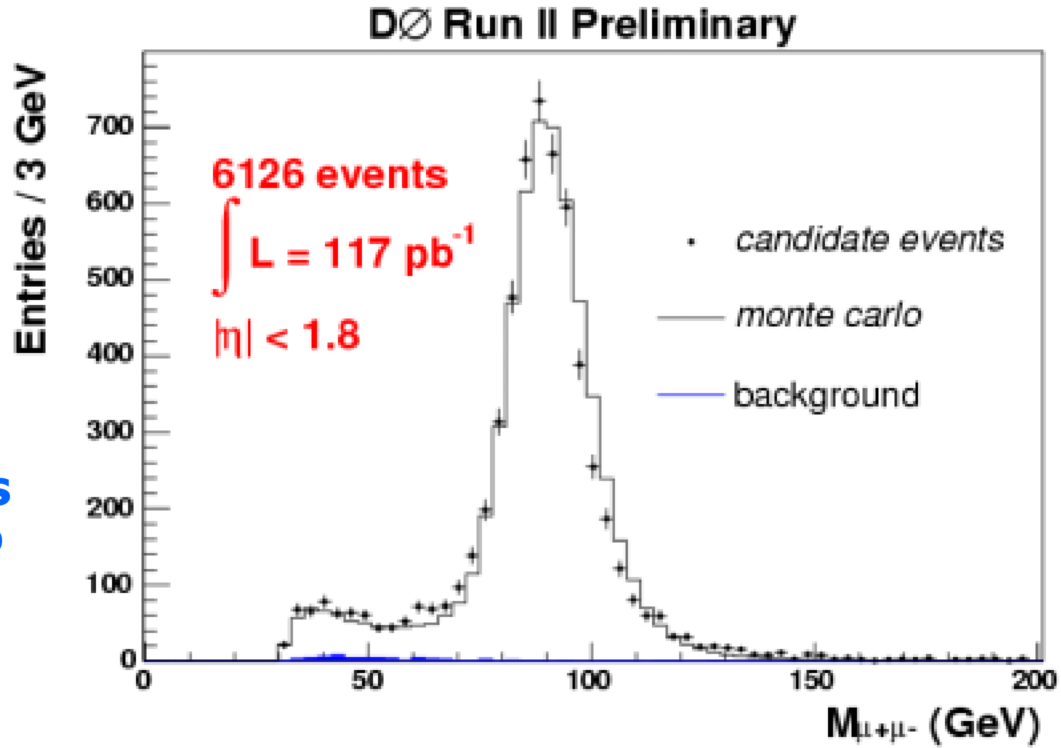
DØ : Z? $\mu^+\mu^-$

Event selection:

- Two central tracks:
  - 'loose' μ-id
  - $p_T > 15$ GeV
  - opposite charge
  - |?| < 1.8
- $M_{\mu\mu} > 30$ GeV
- Cosmic veto
- = 1 isolated μ

- Dominant systematics:
  - luminosity: 10%
  - efficiency measurements from Z? $\mu^+\mu^-$ data: 3.3% (statistics limited)

- $N_{cand} = 6126$
- ?L = 117 pb^{-1}
- Backgrounds:
  - QCD: (0.6 ± 0.3)%
  - Z? $\tau^+\tau^-$: (0.5 ± 0.1)%
- $e_{total} = 19\%$



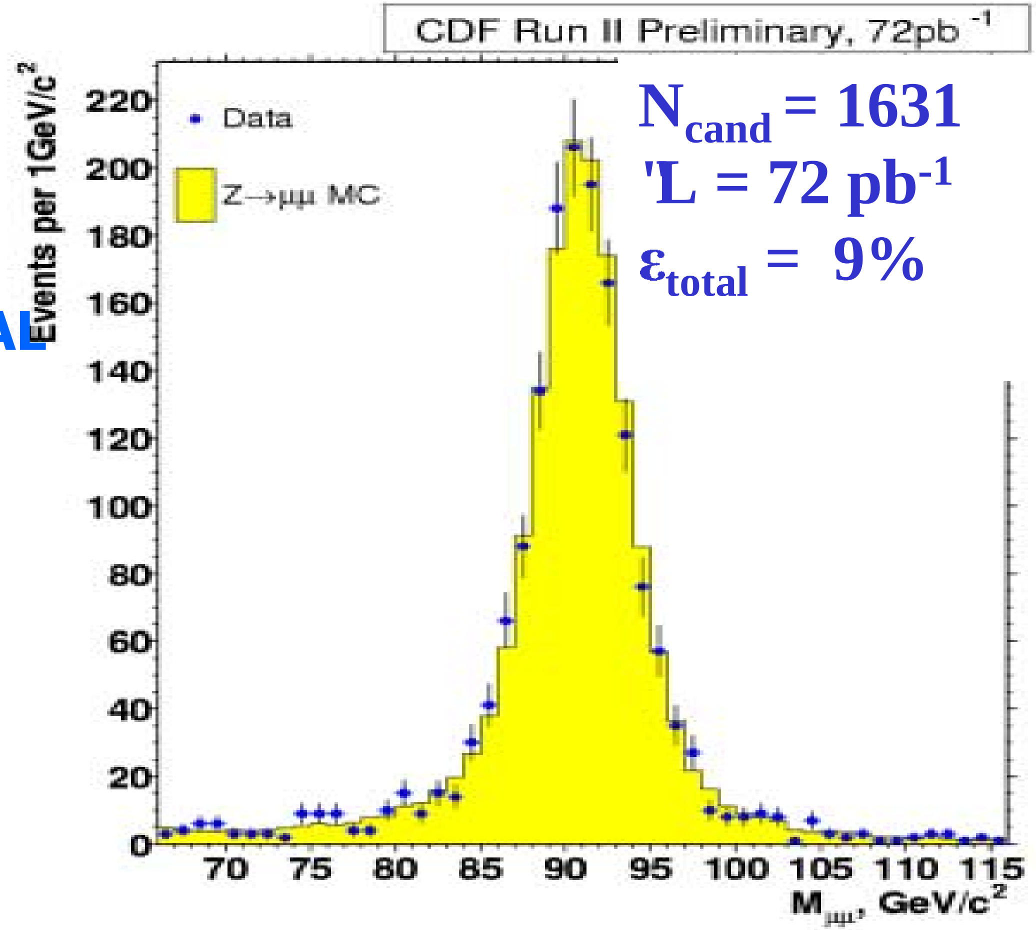
$s_Z \cdot Br(Z? \mu^+\mu^-) = 261.8 \pm 5.0 \pm 8.9 \pm 26.2$ pb

stat. syst. lumi.

CDF: Z? $\mu^+\mu^-$

Event selection:

- Two central tracks:
  - p_T > 20 GeV
  - opposite charge
  - minimum ionizing in CAL
  - at least one |?| < 0.6
  - both |?| < 1.0
- 66 < $M_{\mu\mu}$ < 116 GeV
- Cosmic veto
  - cosmic backgnd (0.9 ± 0.9) %
- Largest systematics:
  - luminosity: 6%
  - PDFs: 3%

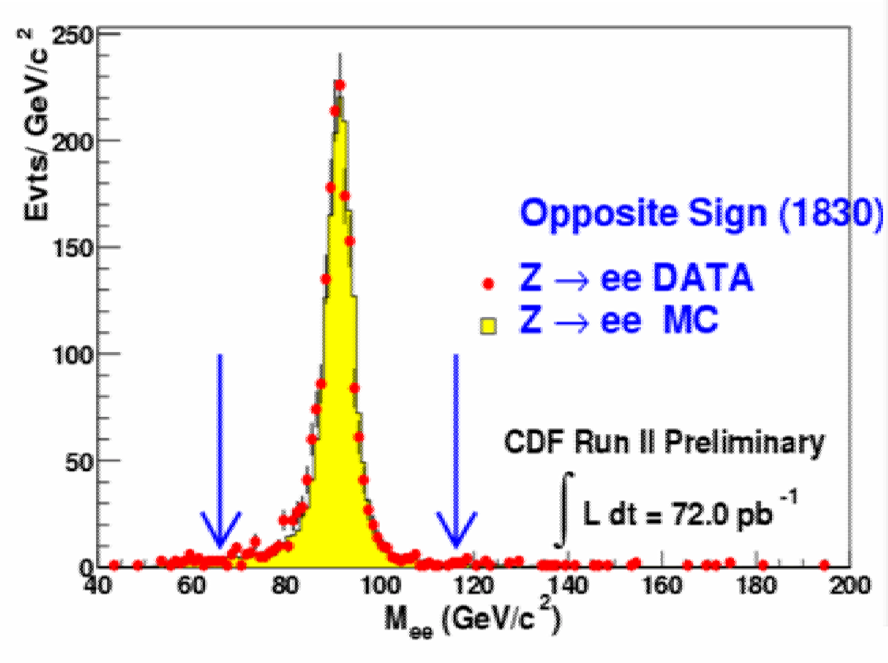


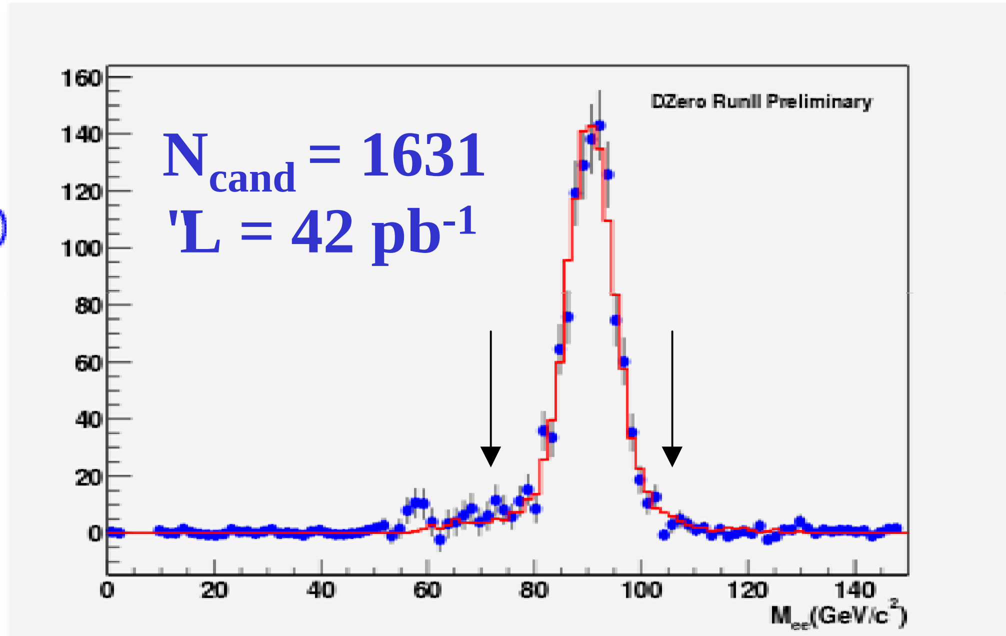
s_Z • Br(Z? $\mu^+\mu^-$) = 246 ± 6 ± 12 ± 15 pb

stat. syst. lumi.

CDF and DØ : Z? e^+e^-

Two isolated electrons, E_T > 25 GeV, |?| < 1.1





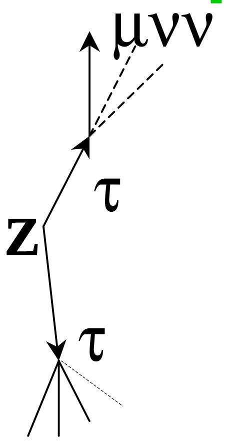
CDF: s$_Z$ • Br(Z? e^+e^-) = 267.0 ± 6.3 ± 15.2 ± 16.0 pb

DØ: s$_Z$ • Br(Z? e^+e^-) = 275 ± 9 ± 9 ± 28 pb

	stat.	syst.	lumi.

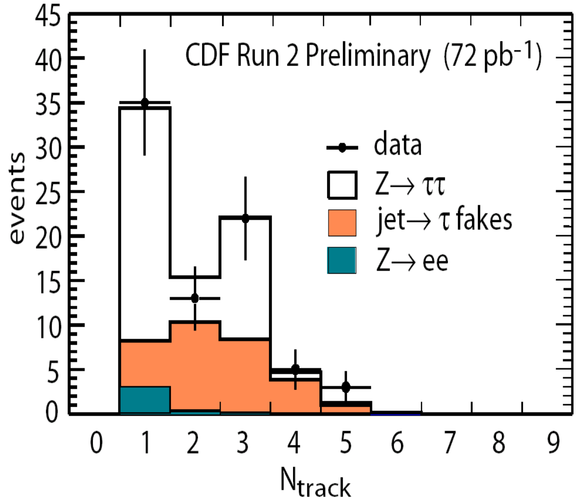
Looking for Z? $\tau^+\tau^-$

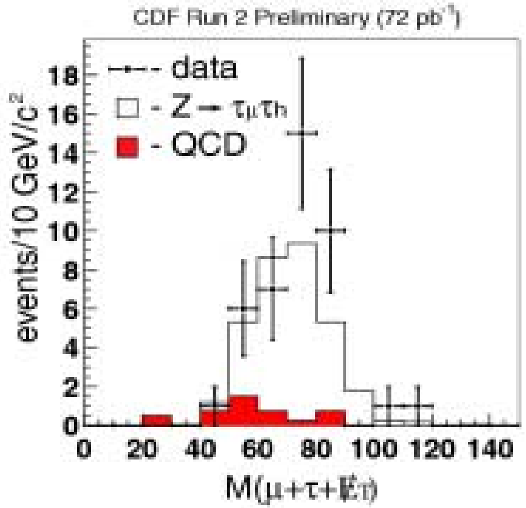
- **Look for isolated, high p_T e or μ opposite narrow hadronic jet**



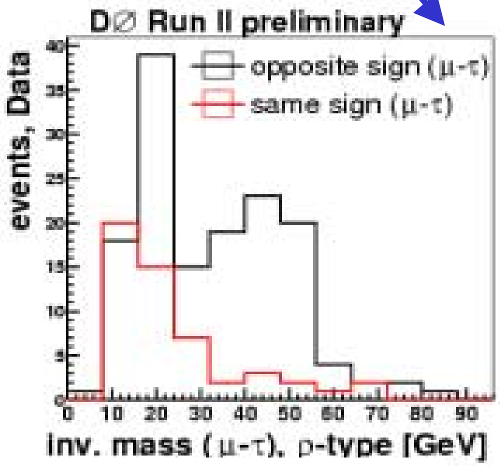
1-3 hadrons + ν

CDF →

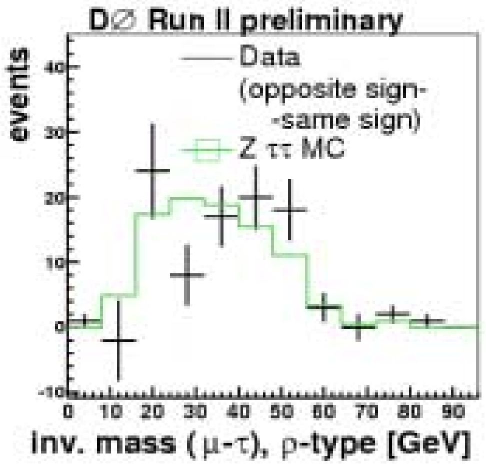




DØ ↘



M(μ- τ)

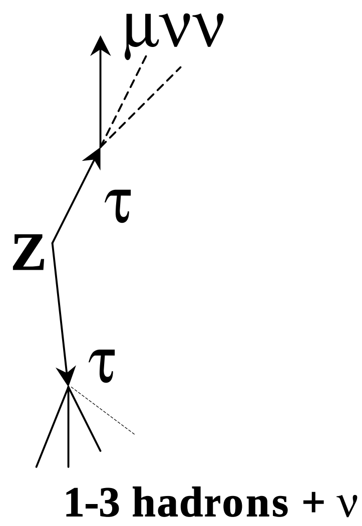


M(μ- τ)

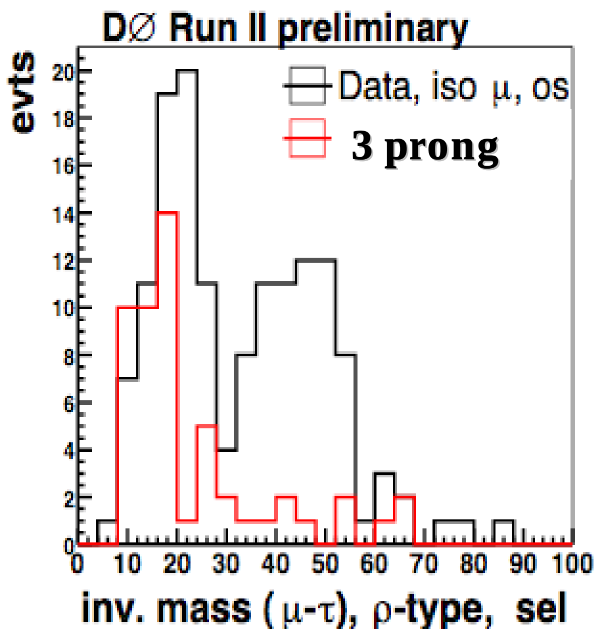
- **small numbers of candidates**
- **rates consistent with expectations**

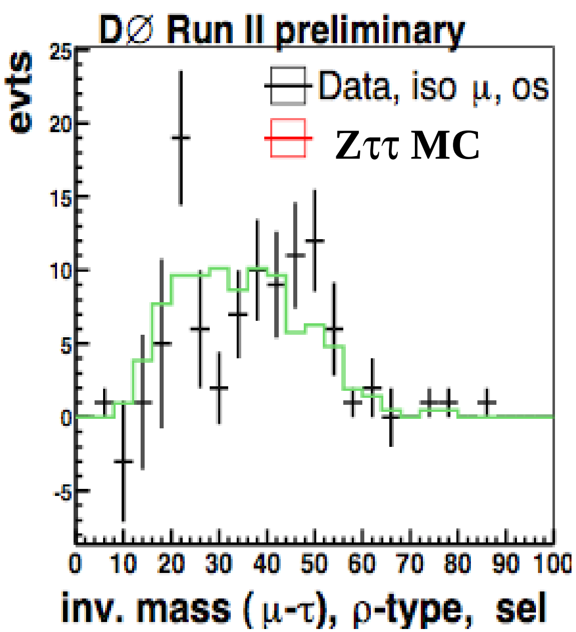
DØ: Z → $\tau^+\tau^-$ Cross Section

- τ's comprise an important final state of many processes
  - eg. Top, Higgs, searches for new phenomena
- consider decays giving final states with 1 μ + 1 hadronic τ
  - excellent way to study hadronic tau reconstruction
- main backgrounds
  - heavy flavor, Z dimuon



68 pb^{-1}



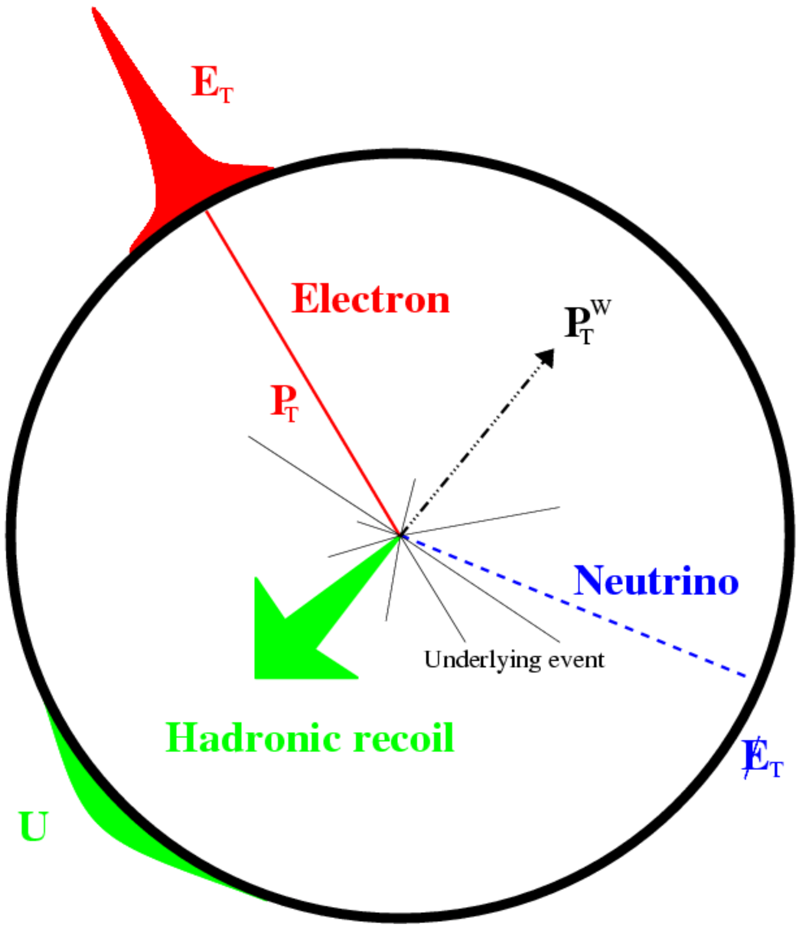


cross sections:

1-prong: 235 ± 127 pb

3-prong: 222 ± 71 pb

Experimental Signature: W? lν



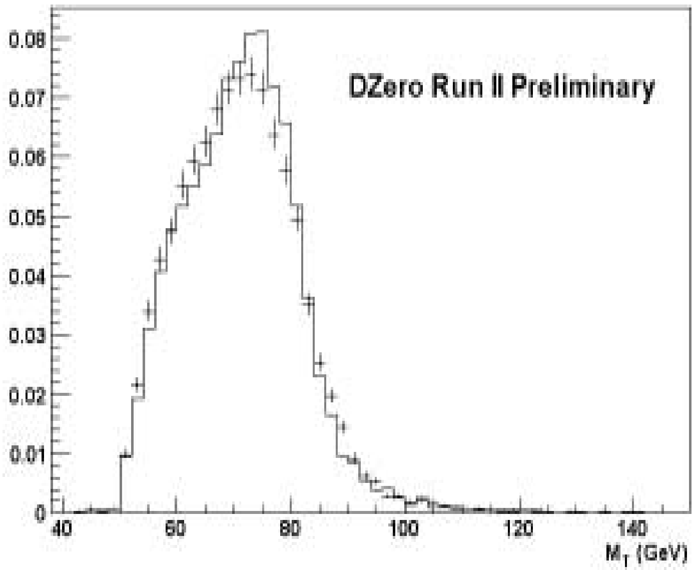
- **single charged lepton:**
  - **high p_T**
  - **isolated**
- **E_T^{miss} (from neutrino)**

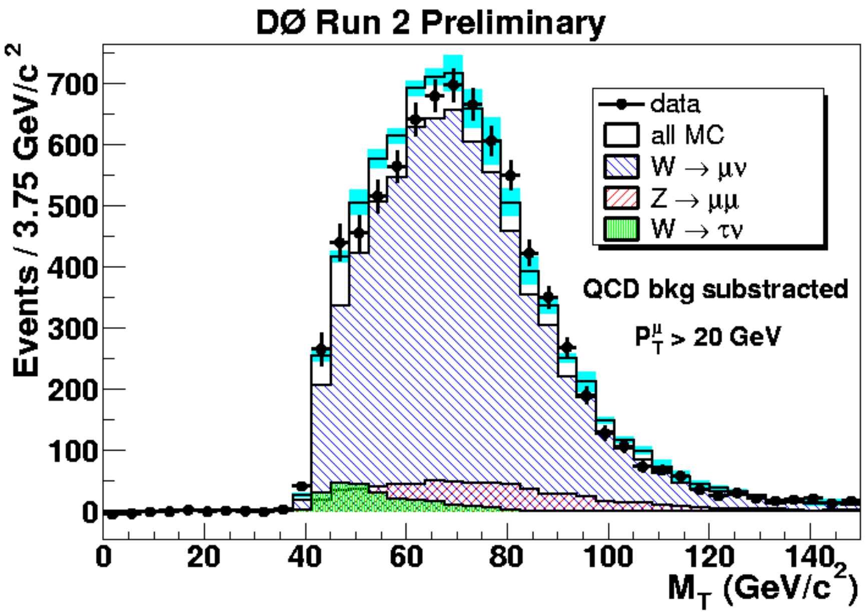
- **less redundancy in trigger and offline selection**
- **more difficult to control backgrounds and systematics**
- **need to understand hadronic recoil**
- **but more 'interesting' than Z ! (post-LEP)**
- **s•Br 10 times larger than Z**

DØ: W? eν and W? μν

- $p_T(e)$ > 25 GeV
- E_T^{miss} > 25 GeV
- N_{cand} = 27370
- ?$\mathcal{L}$ = 42 pb^{-1}

- $p_T(\mu)$ > 20 GeV
- E_T^{miss} > 20 GeV
- N_{cand} = 8302
- ?$\mathcal{L}$ = 17 pb^{-1}





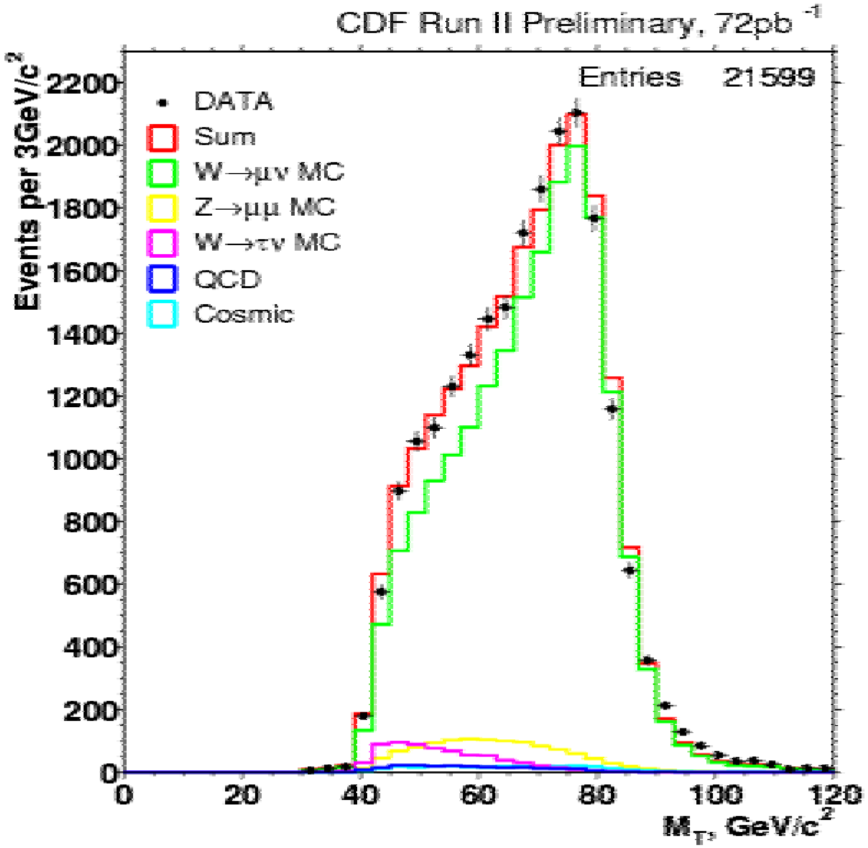
s_W • Br(W? eν) = 2.88 ± 0.02 ± 0.13 ± 0.29 nb

s_W • Br(W? μν) = 3.23 ± 0.13 ± 0.10 ± 0.32 nb

stat. syst. lumi.

CDF: W? μν and W? eν

- $p_T(\mu) > 20$ GeV | $p_T(e) > 25$ GeV
- $E_T^{miss} > 20$ GeV | $E_T^{miss} > 25$ GeV
- $N_{cand} = 21599$ | $N_{cand} = 38628$
- 1 = 72 pb^{-1} | 1 = 72 pb^{-1}



- **Backgrounds:**
  (10.8±1.1)% | (3.5 ± 1.7)%

- **Systematics:**
  PDFs 2.6%
  hadronic recoil 1.6%

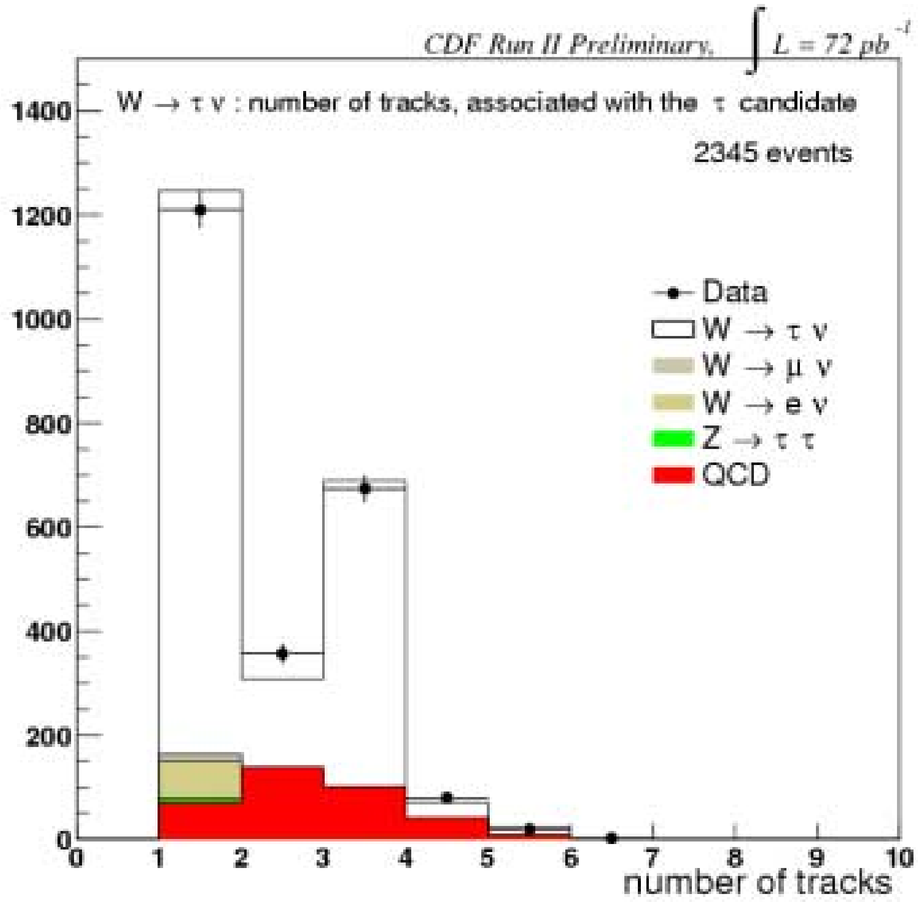
s_W • Br(W? μν) = 2.64 ± 0.02 ± 0.12 ± 0.16 nb

s_W • Br(W? eν) = 2.64 ± 0.01 ± 0.09 ± 0.16 nb

stat. syst. lumi.

CDF: W? τ ν

- Look for jet in a narrow 10 degree cone
- Isolated within wider 30 degree cone
- $p_T(\tau) > 25$ GeV
- $E_T^{miss} > 25$ GeV
- $N_{cand} = 2345$



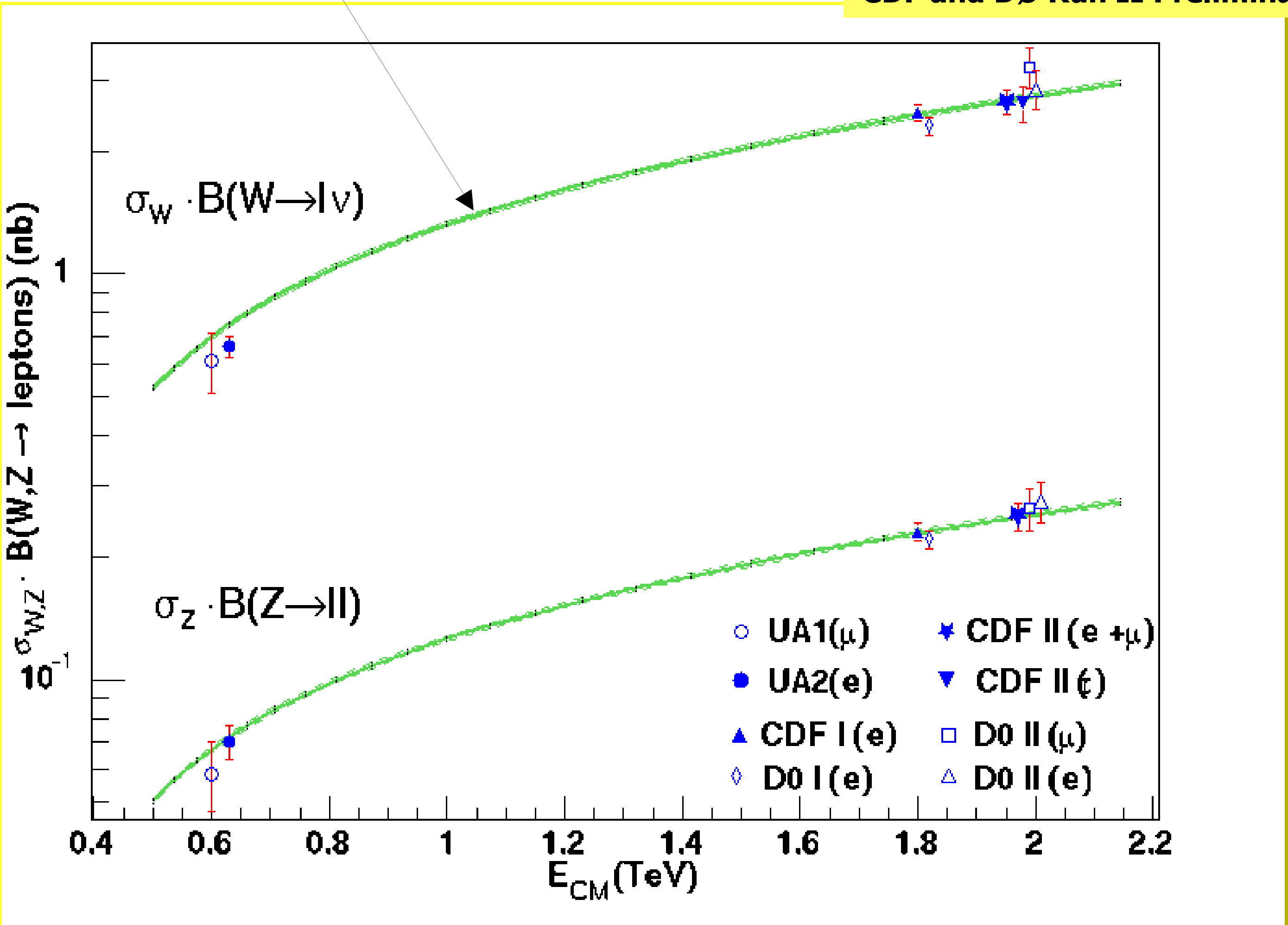
$\sigma_W \cdot Br(W? \ \tau\nu) = 2.62 \pm 0.07 \pm 0.21 \pm 0.16$ nb

stat. syst. lumi.

W and Z Cross Section Summary

- **Scaling with cm energy consistent**
  - *CR Hamberg, WL van Neerven and T Matsuura, Nucl. Phys. B359 (1991) 343 [CTEQ4M pdf]*

CDF and DØ Run II Preliminary



Measurements consistent with SM predictions

Ratio of W/Z Production Cross Sections

- **Use previous $\sigma\times$B measurements in ratio to extract Γ(W) – *Indirect Method***
  - **Many uncertainties cancel in ratio**

$$R = \frac{\sigma(W)\times B(W\to\ell\nu)}{\sigma(Z)\times B(Z\to\ell\ell)}$$

Theory: $\sigma(W)/\sigma(Z)$

Theory: $\frac{\Gamma^e}{\Gamma(W)}$

LEP: $B(Z\to\ell\ell)$

- **Run II DØ Preliminary:**

$$R_e = 10.34 \pm 0.35_{stat} \pm 0.48_{syst}$$

Use CTEQ6 pdf + errors

- **Run I DØ Result:**

$$R_e = 10.49 \pm 0.14_{stat} \pm 0.21_{syst}$$

*Phys. Rev. D **61**, 072001 (2000)*

CDF - DØ Combined Results

http://tevewwg.fnal.gov

Extract W width Γ(W) from the ratio of W/Z production cross sections:

- **CDF Run II Preliminary:**
  $R_e = 9.88 \pm 0.24_{stat} \pm 0.47_{syst}$
  $R_\mu = 10.69 \pm 0.27_{stat} \pm 0.33_{syst}$
- **DØ Run II Preliminary:**
  $R_e = 10.34 \pm 0.35_{stat} \pm 0.48_{syst}$
- **Tevatron Run II Preliminary:**

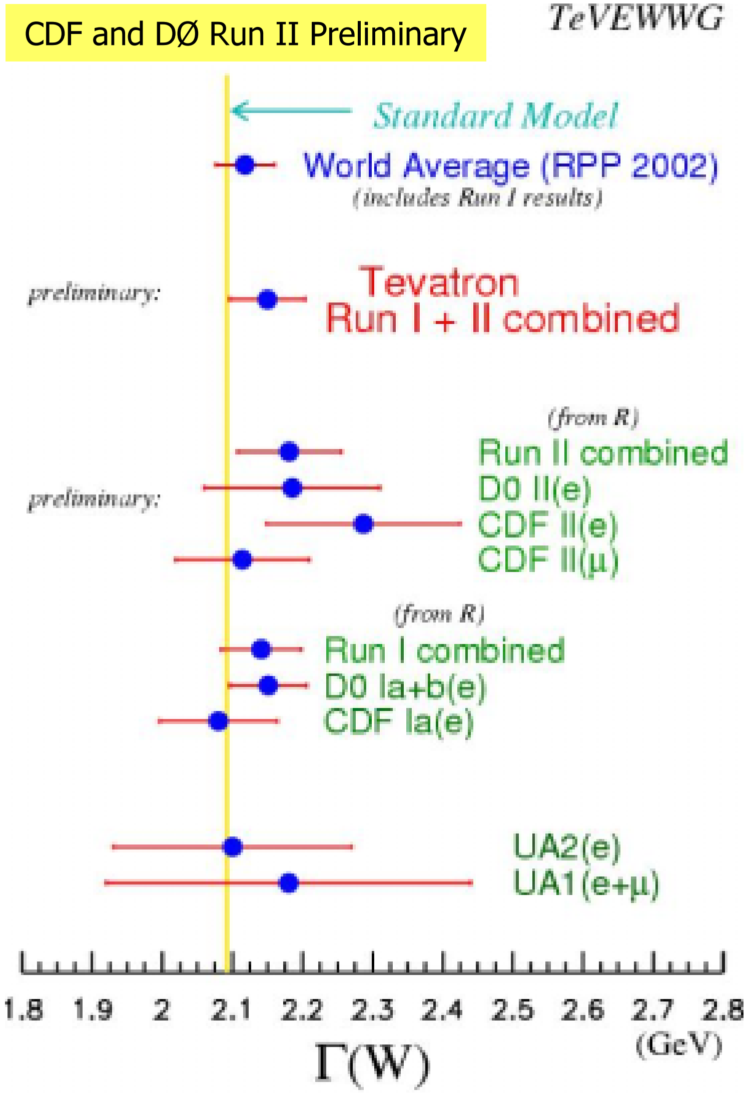
$$R = 10.36 \pm 0.31 \quad \Rightarrow \quad \Gamma(W) = 2.181 \pm 0.073\,\mathrm{GeV}$$

- **Tevatron Run I Result:** $\Gamma(W) = 2.141 \pm 0.057\,\mathrm{GeV}$
- **Tevatron Run I + II Preliminary:** $\Gamma(W) = 2.150 \pm 0.054\,\mathrm{GeV}$

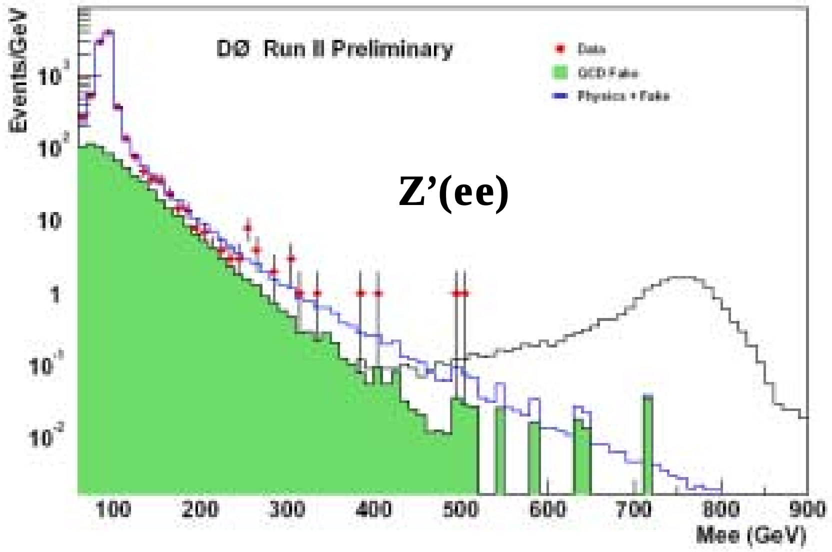
CDF- DØ Combined Results

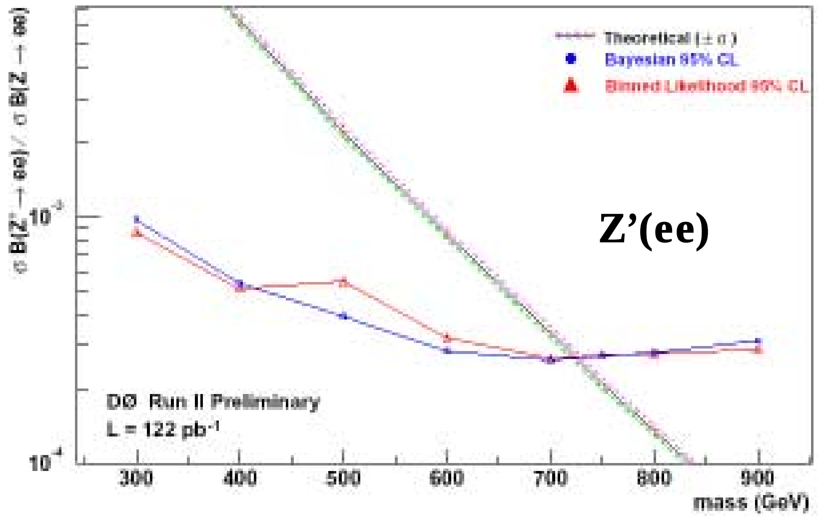
Part I'

http://tevewwg.fnal.gov



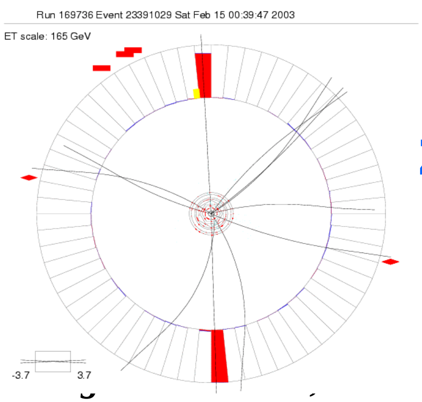
New Heavy Gauge Bosons?

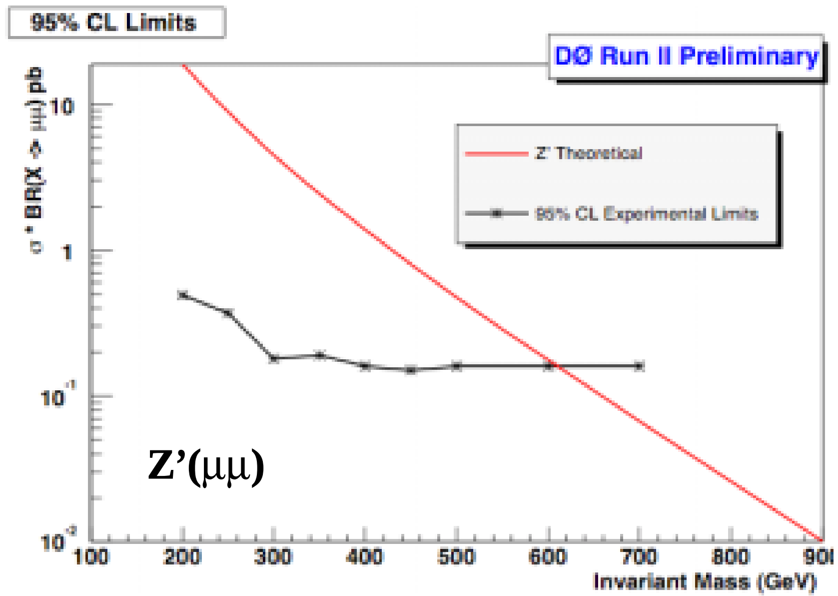




- **Z′ searches**
  - **Z′ → ee**
    - **122 pb^{-1}**
    - **$M_{Z'}$ > 719 GeV @ 95% c.**
    - **more sensitive than Run I**
  - **Z′ → μμ**
    - **100 pb^{-1}**
    - **$M_{Z'}$ > 620 GeV @ 95% c.l**

M_{ee} = 388 GeV

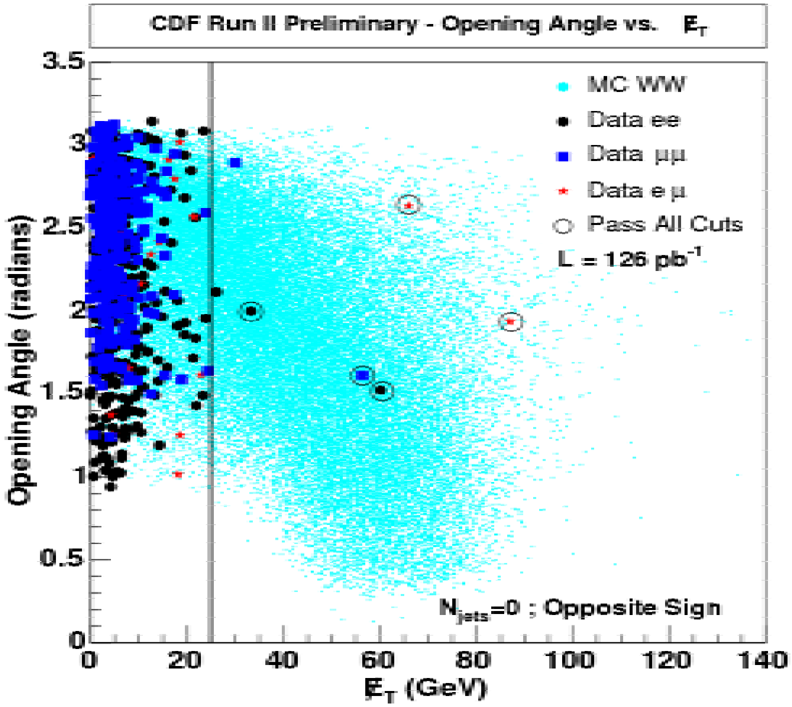




CDF : WW Production

- isolated lepton pair
- opposite-charge, high p_T
- E_T^{miss}
- Z veto
- veto events with jets
- $\mathcal{L}$ = 126 pb^{-1}
- 5 events seen
- 9.2 events expected

(2.3 background, 6.9 ± 1.5 W W ? lν lν)



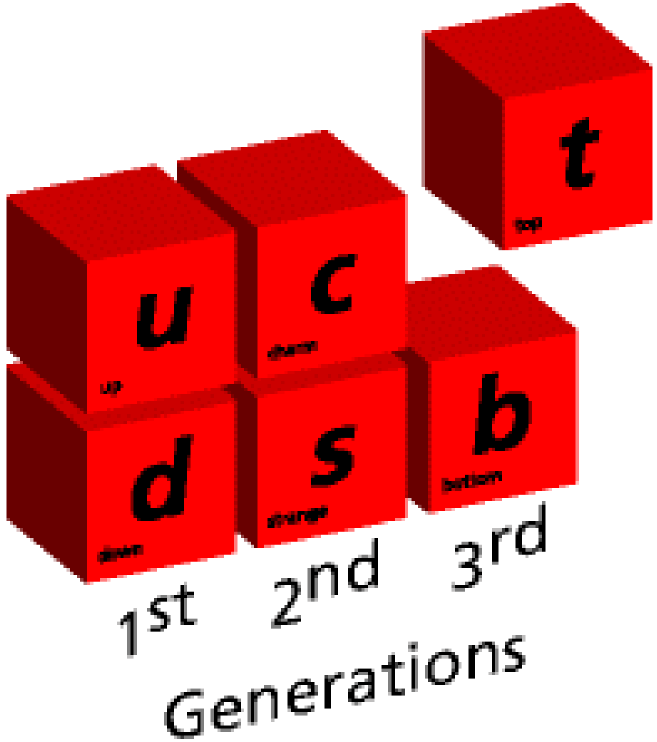
$$\sigma_{meas}^{p\bar{p}\to WW} = 5.1^{+5.4}_{-3.6} \text{ (stat)} \pm 1.3 \text{ (syst)} \pm 0.3 \text{ (lumi) pb} .$$

$$\sigma_{theo:NLO}^{p\bar{p}\to WW} = 13.25 \pm 0.25 \text{ pb} \quad \text{J.M.Campbell, R.K.Ellis} \quad \text{hep-ph/9905386}$$

Top Physics: Introduction

Top quark was expected in the Standard Model (SM) of electroweak interactions as a partner of b-quark in SU(2) doublet of weak isospin for the third family of quarks

- **Discovered in 1995 (CDF&D0)**



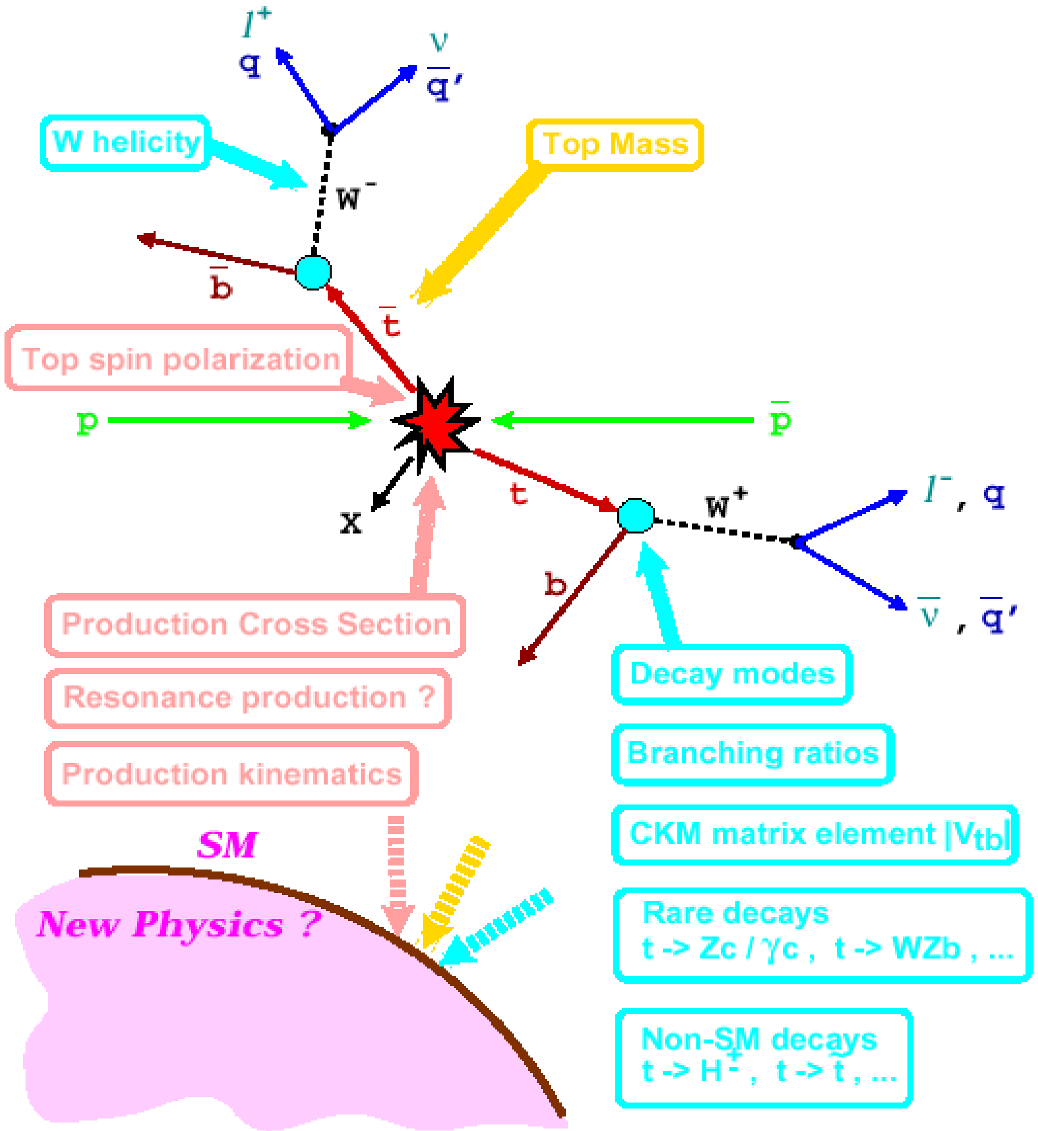
In Run I statistical uncertainties dominated:

- **Overall consistency with the SM picture**
- **But more tests need to be done**

In anticipation of much increased statistics in Run II:

- **Rich physics menu**
- **Increased luminosity → increased precision**
- **Surprises?**
  - **Preliminary results on: cross section, mass and single top**

Top Physics

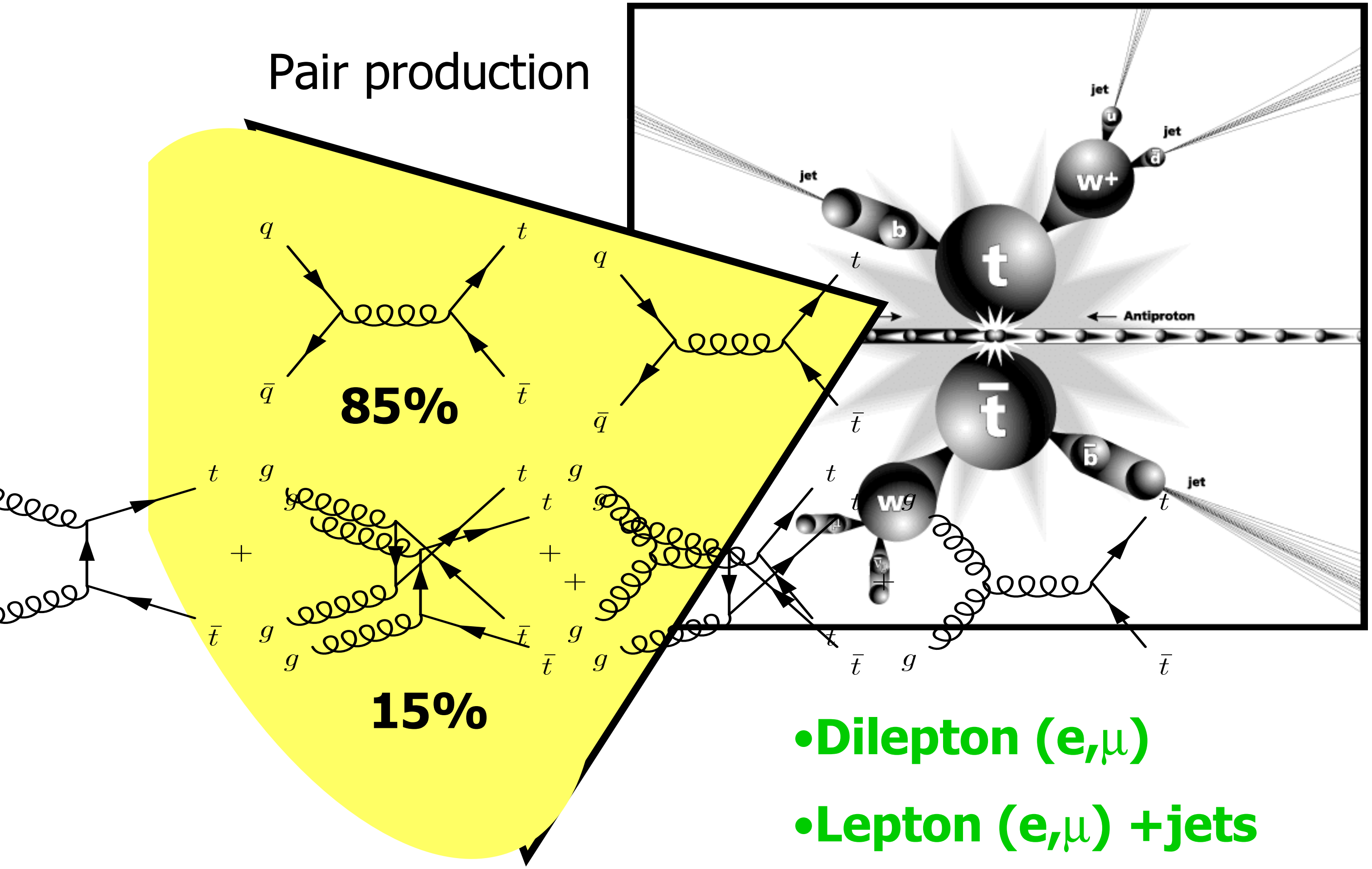


<u>Topics treated here</u>

- Top production & decay
- Tools
- Cross section
- Single top
- Mass

Top Quarks at the Tevatron

Pair production



B(t? Wb) = 100%

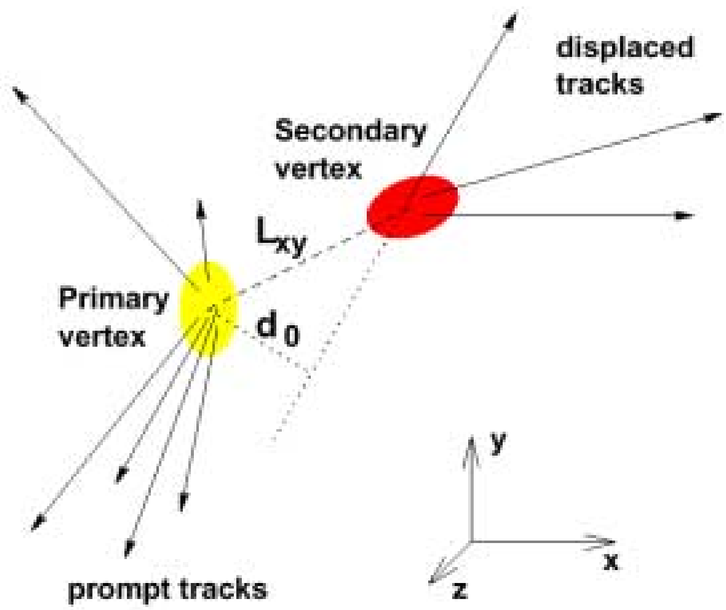
W's decay modes used to classify the final states

•**Dilepton (e,μ)**	**BR=5%**
•**Lepton (e,μ) +jets**	**BR=30%**
•**All jets**	**BR=44%**
• τ_{had}**+X**	**BR=21%**

Top: Signal vs. Background

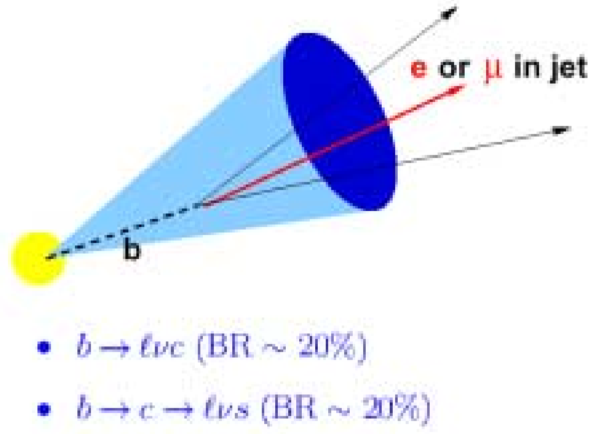
- **How to separate signal from background:**
  - Top events have very distinctive signatures
    - Decay products (leptons, neutrinos, jets) have large p_T's
    - Event topology: central and spherical
    - Heavy flavor content: always 2 b jets in the final state!
- **Tools:**
  - Lepton ID: detector coverage and robust tracking
  - Calorimetry: hermetic and well calibrated
  - B identification: algorithms pure and efficient
  - Simulation: essential to reach precision goals

How to tag a high p_T B-jet



Silicon Vertex Tag

- **Signature of a b decay is a displaced vertex:**
  - **Long lifetime of b hadrons ($c\tau \sim 450\ \mu m$)+ boost**
  - **B hadrons travel L_{xy}~3mm before decay with large charged track multiplicity**



Soft Lepton Tag

Exploits the b quarks semi-leptonic decays

⇒ **These leptons have a softer p_T spectrum than W/Z leptons**

⇒ **They are less isolated**

B-tagging at hadron machines established:
- crucial for top discovery in RunI
- essential for RunII physics program

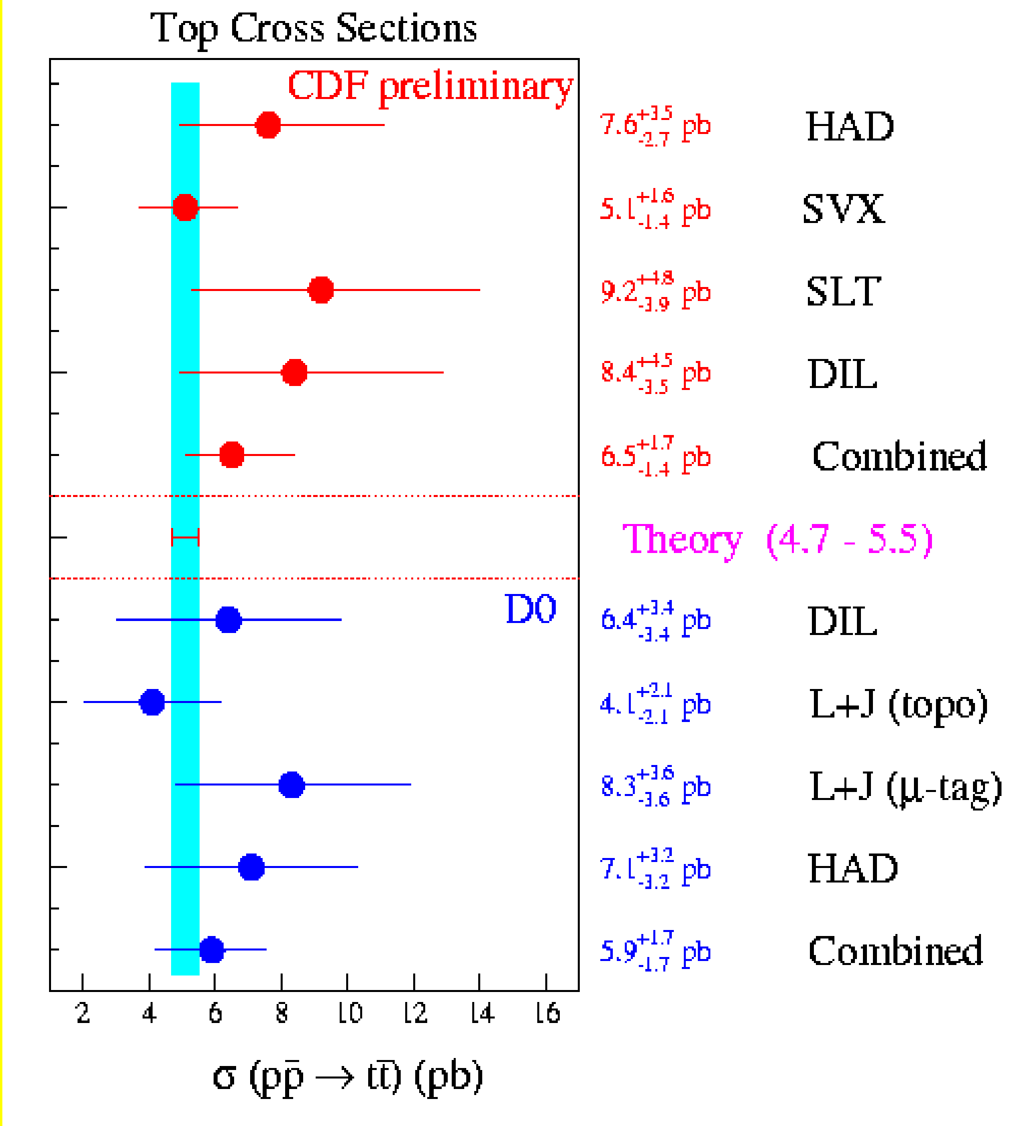
Production Cross Section

- **Test of QCD**
  - discrepancies from QCD might imply non SM physics
    - SUSY processes
    - Top-color objects
  - Current uncertainty is statistics dominated

- **Experimental handles for RunII:**
  - Larger overall efficiency (lepton ID, trigger, btagging) w/ better background rejection
  - Main systematics (jet energy scale, ISR, e_{btag}) scale with $1/\sqrt{N}$, and are controlled with the Data

RunII ($2fb^{-1}$) $\delta\sigma_{tt}/\sigma_{tt} < 10\%$

Run I Summary



Gregorio Bernardi, LPNHE Paris, DØ

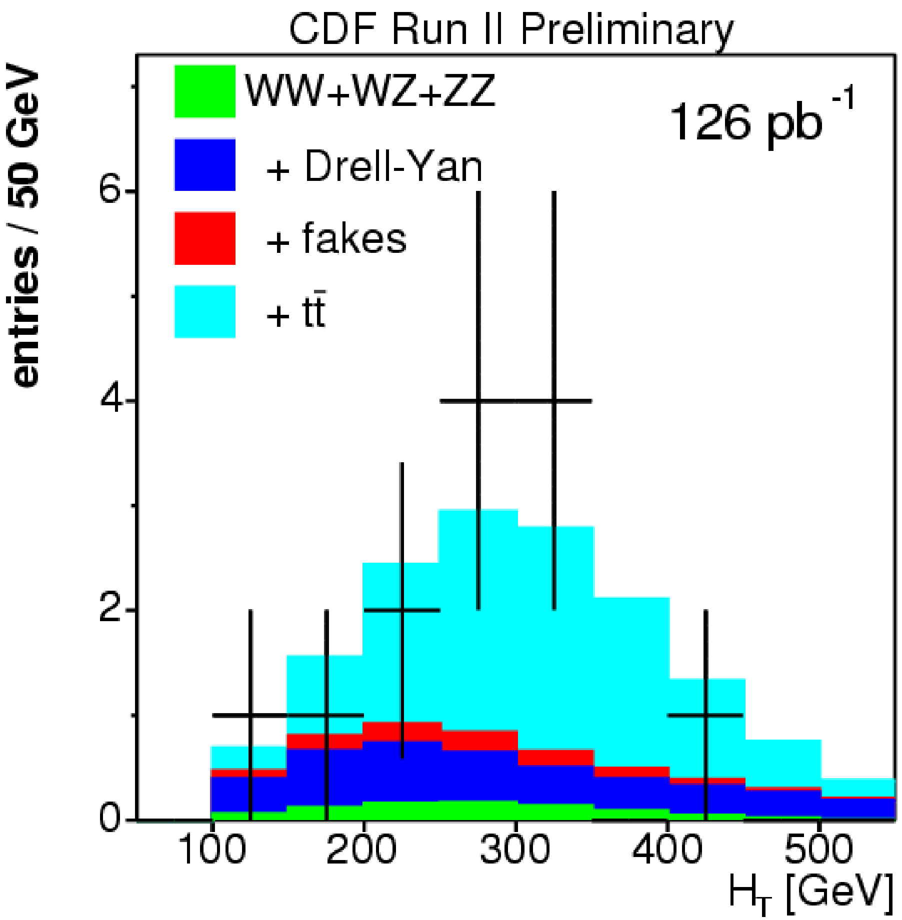
Run II Cross Section – Dilepton channel

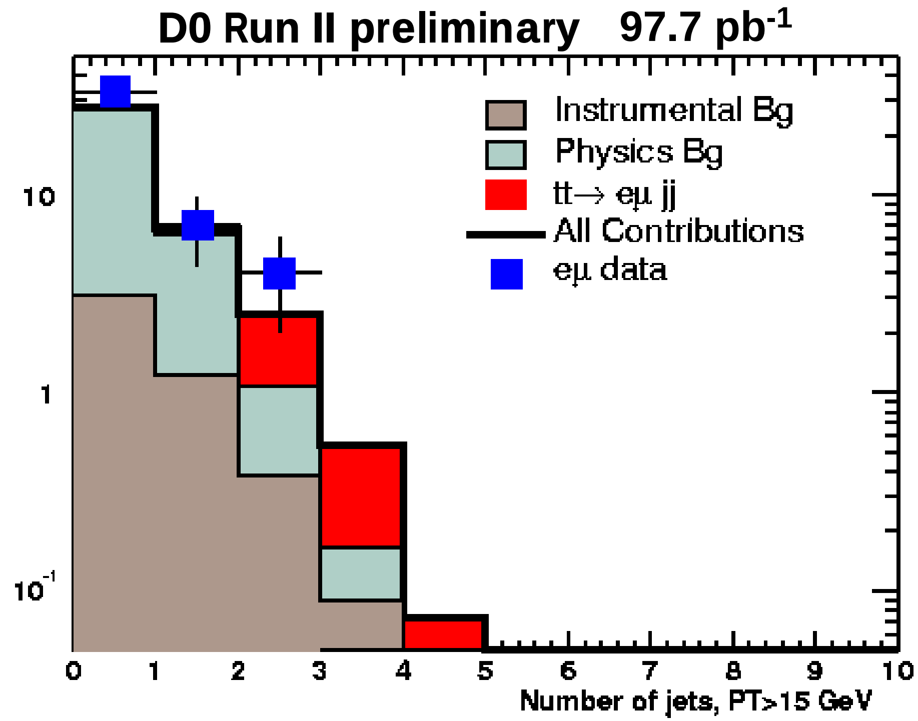
2 high p_T leptons (e,μ,τ,iso track)

Large Missing E_T

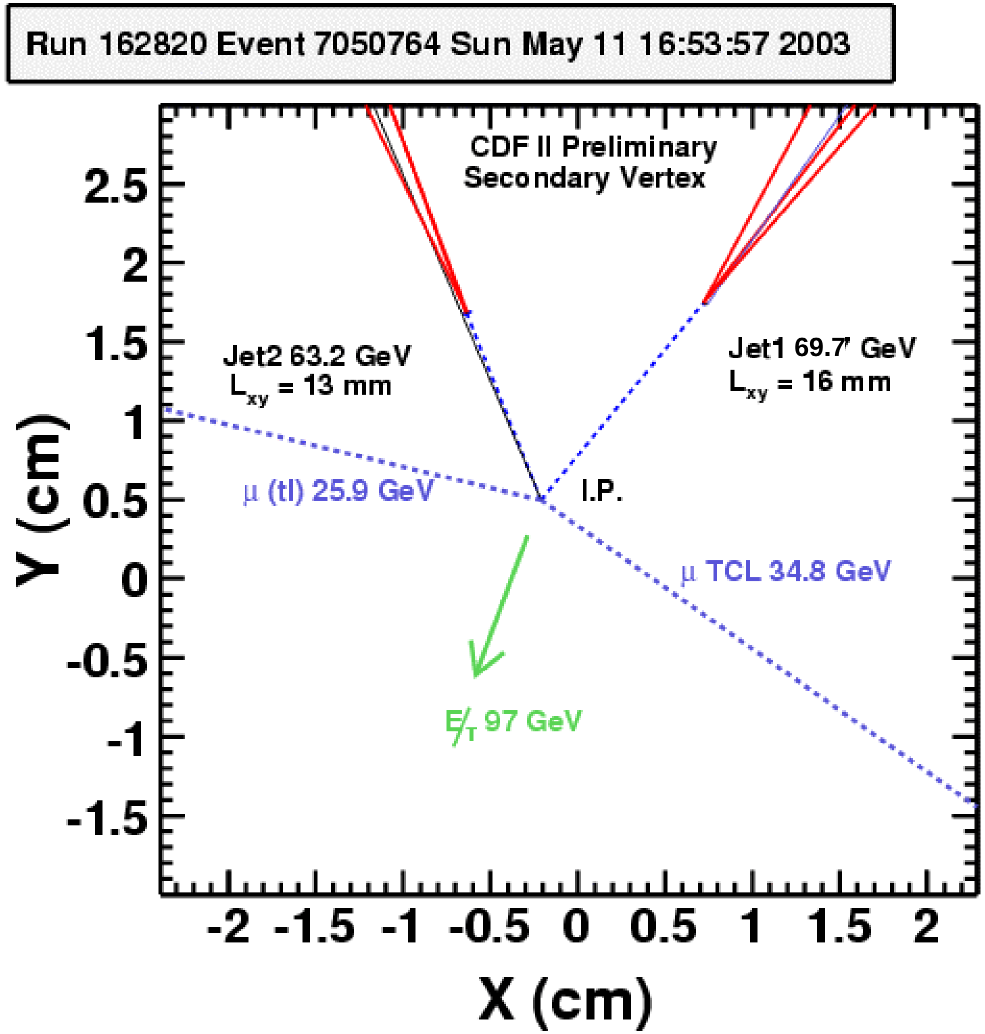
2 central jets

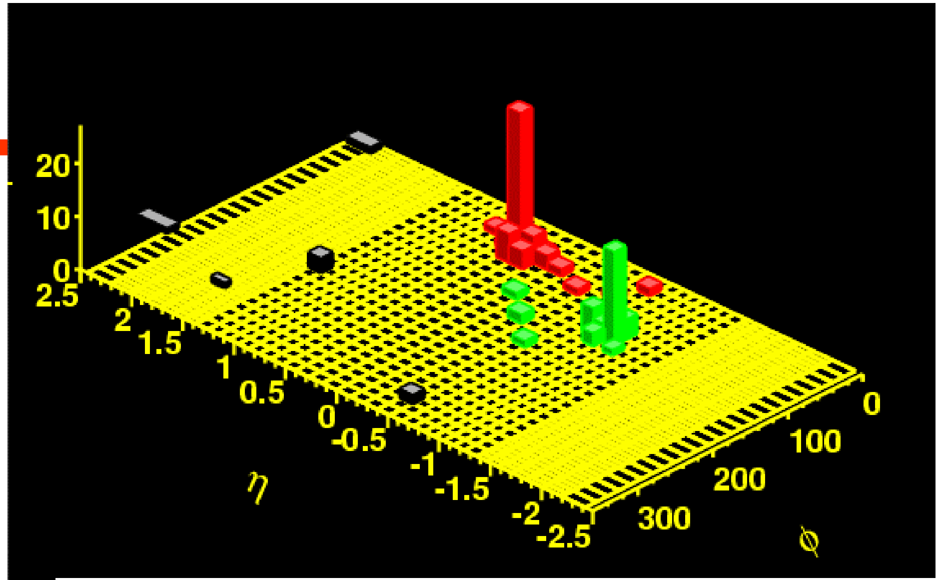
H_T: scalar sum of all the measured "objects" E_T's (leptons,jets)

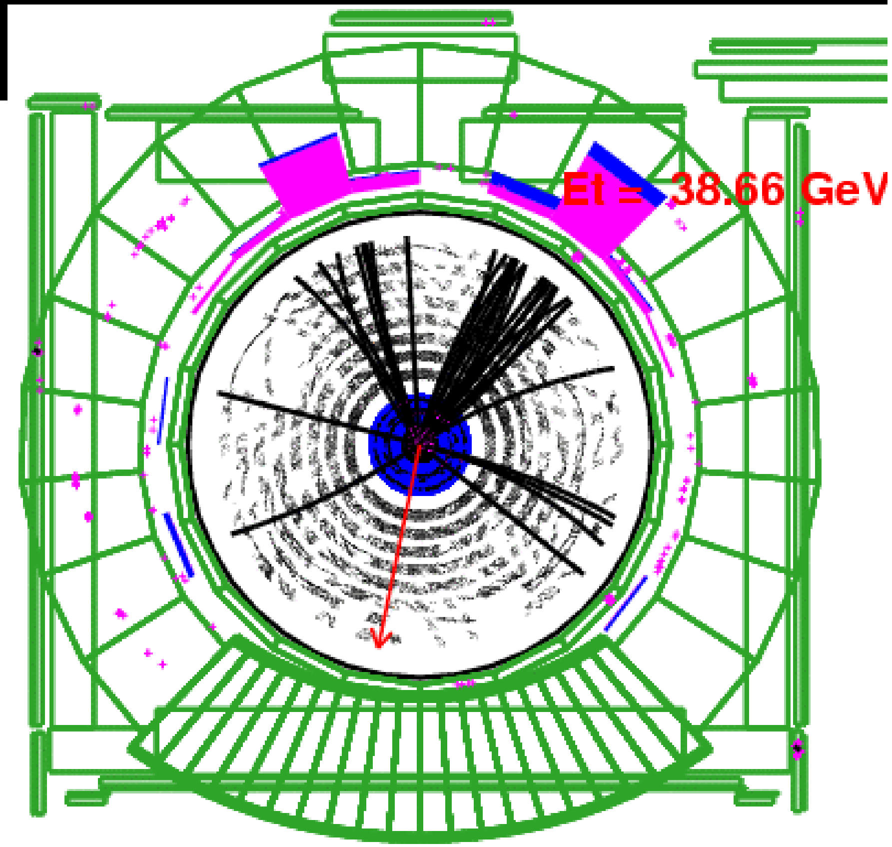




Double b-tagged
Dilepton event @ CDF



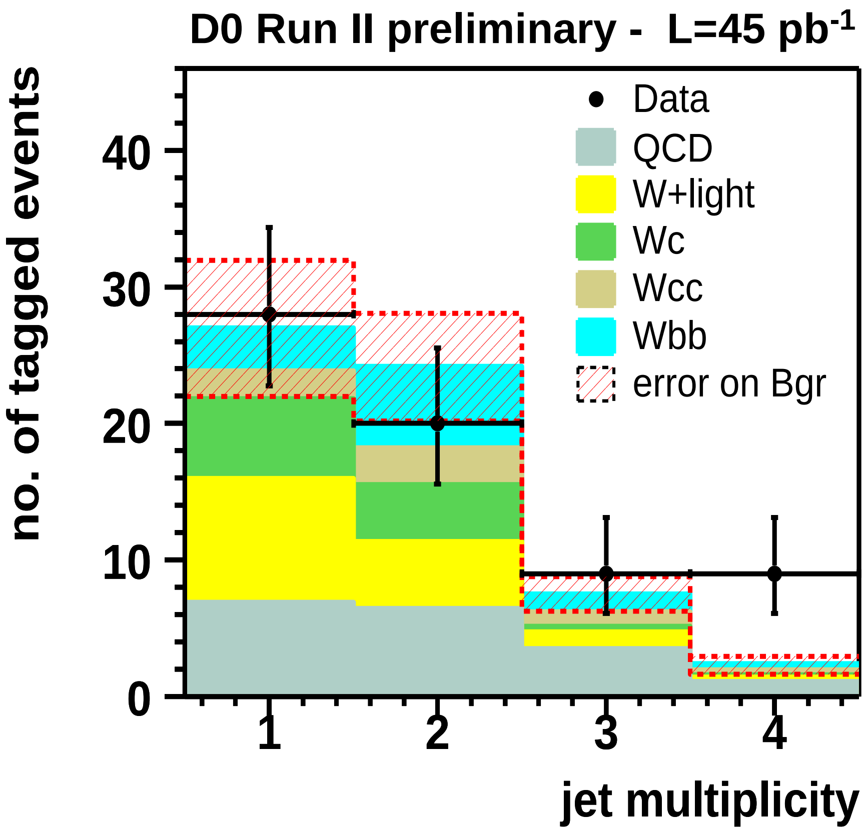


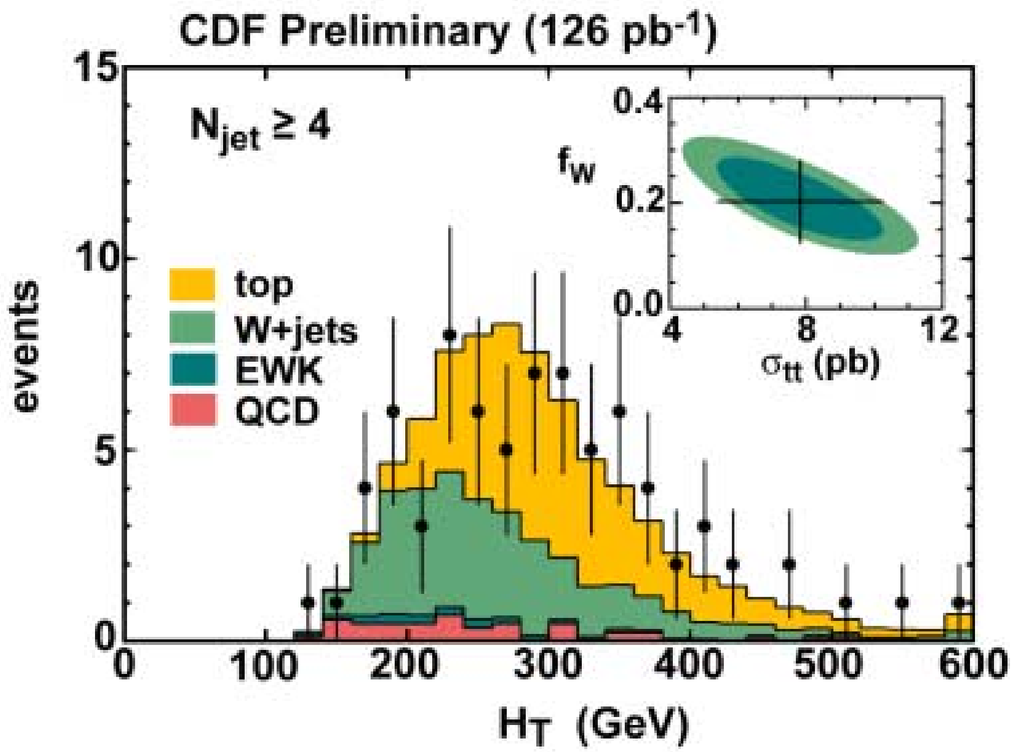


Run II Cross Section – lepton+jets

- 1 high p_T lepton(e,μ)
- Large Missing E_T
- ≥3 central jets

This signature suffers from large W+jets background. Isolate signal using: **SVX B-tag** and/or **kinematics**





e +jets/topological

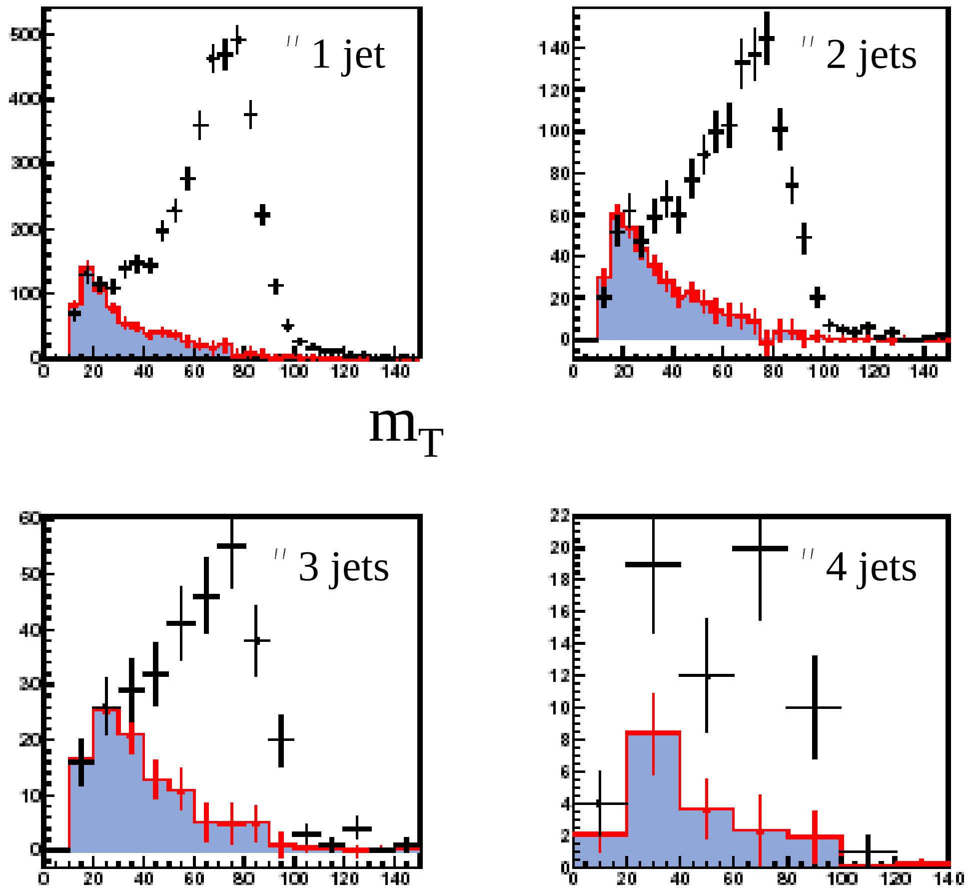
use strategy of looking for events kinematically like top

- veto on soft muons

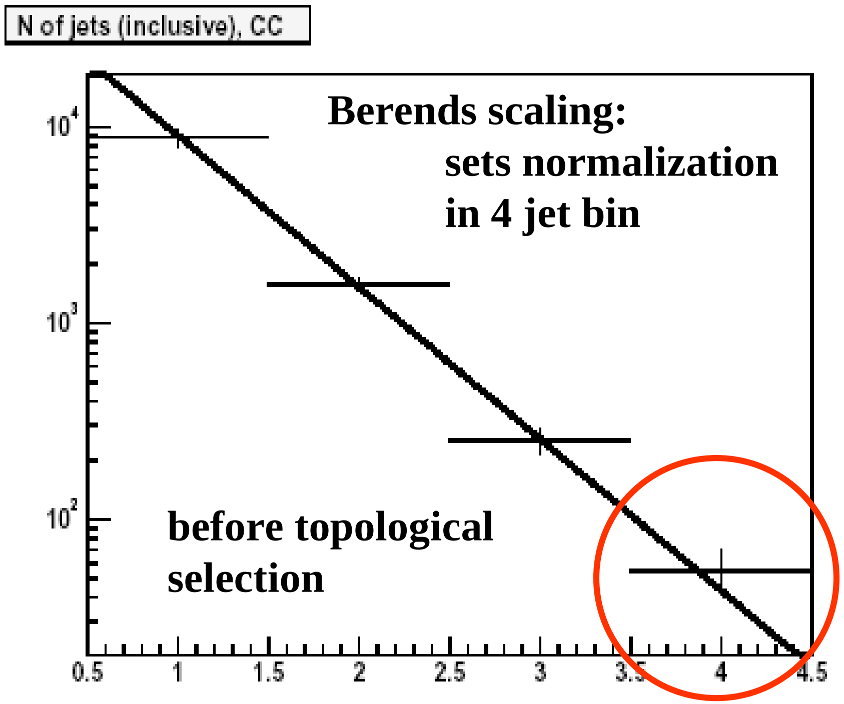
L: 92 pb^{-1}

Backgrounds:

- W+jets, multijet with fake '*e*'

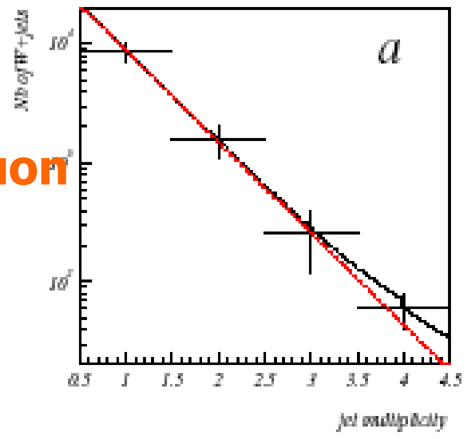


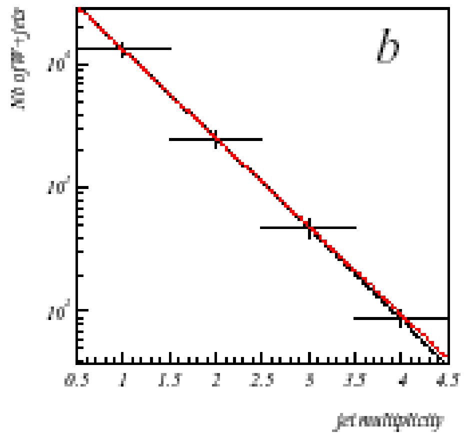
matrix method to separate W/QCD



DØ: 6.8 ± 1.6 evts background
12 events observed

DØ: Lepton+Jets Using *b*-Tagging





soft lepton tag

- relax topological selection
  - require soft, non-isolated muon within a jet
- *e*+jets and μ+jets channels

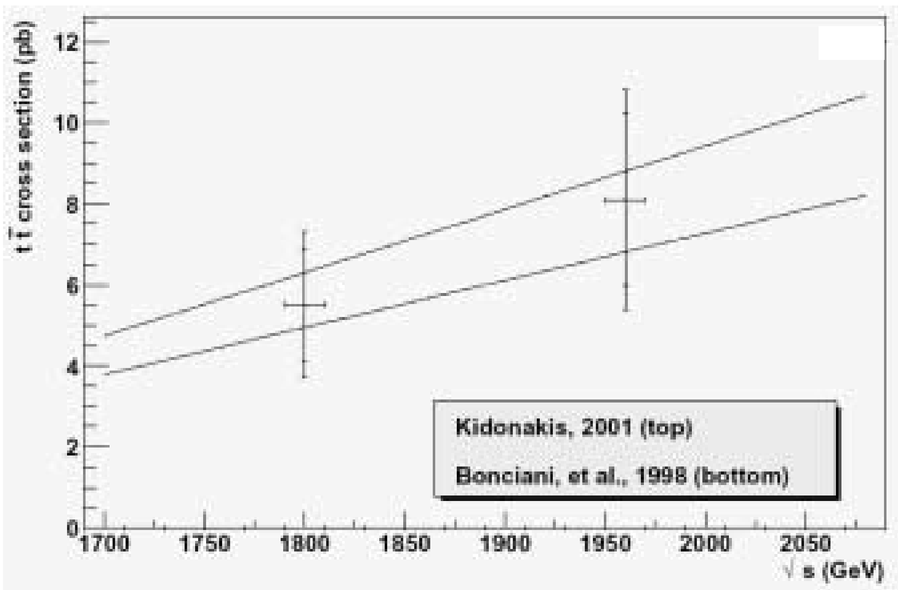
$$11.4^{+4.1}_{-3.5}(stat.)^{+2.0}_{-1.8}(sys.)\ \text{pb}$$

detached vertex tag is consistent

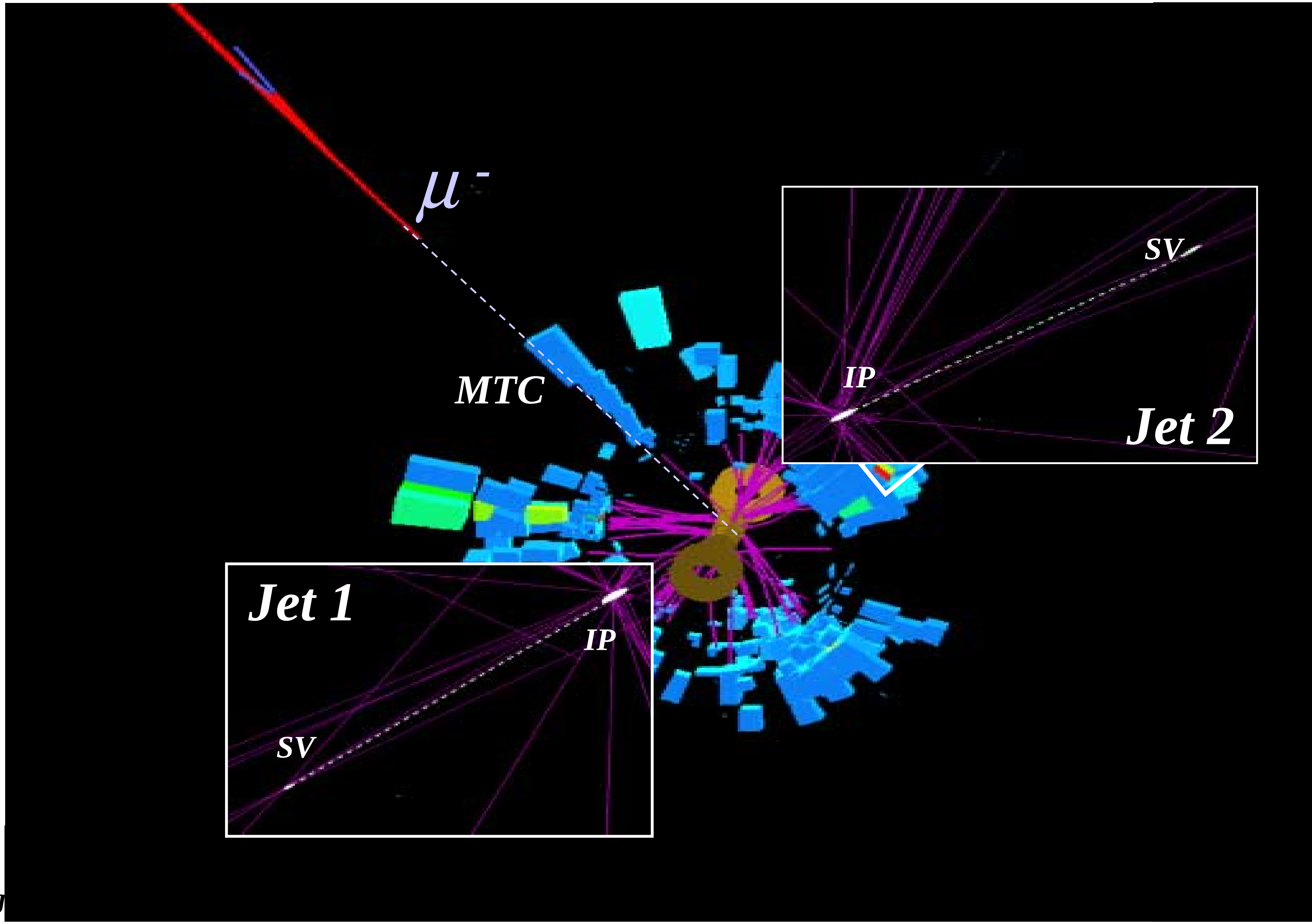
Combined Cross Section:

- dilepton
- *l*+jets/topological
- *l*+jets with soft muon tag

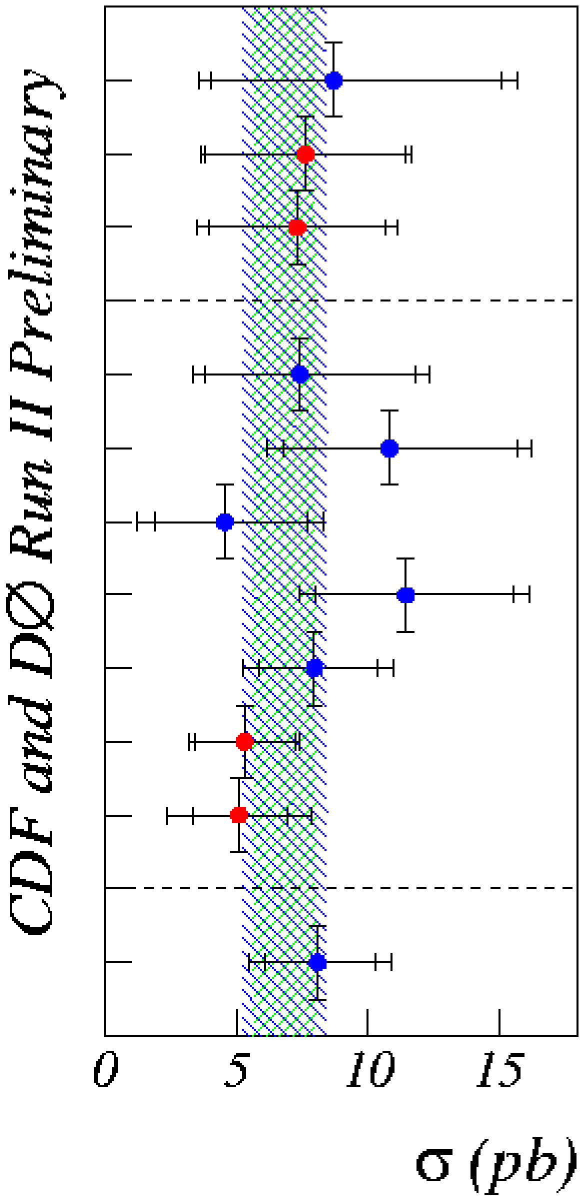
$$8.1^{+2.2}_{-2.0}(stat.)^{+1.6}_{-1.4}(sys.)\pm 0.8(lum.)\ \text{pb}$$



μ+jets Double Tagged event @D0

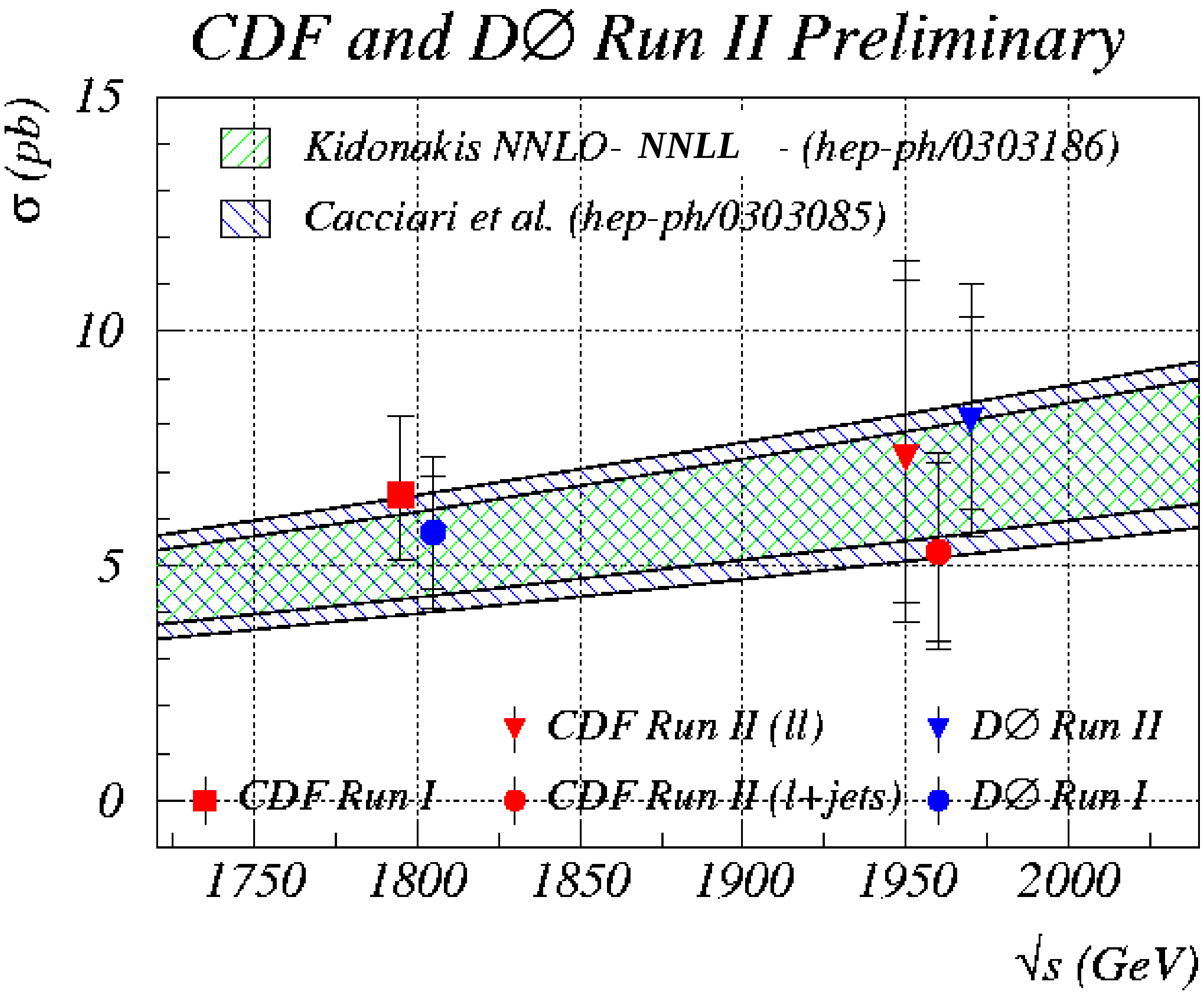


Run II Cross Section Summary



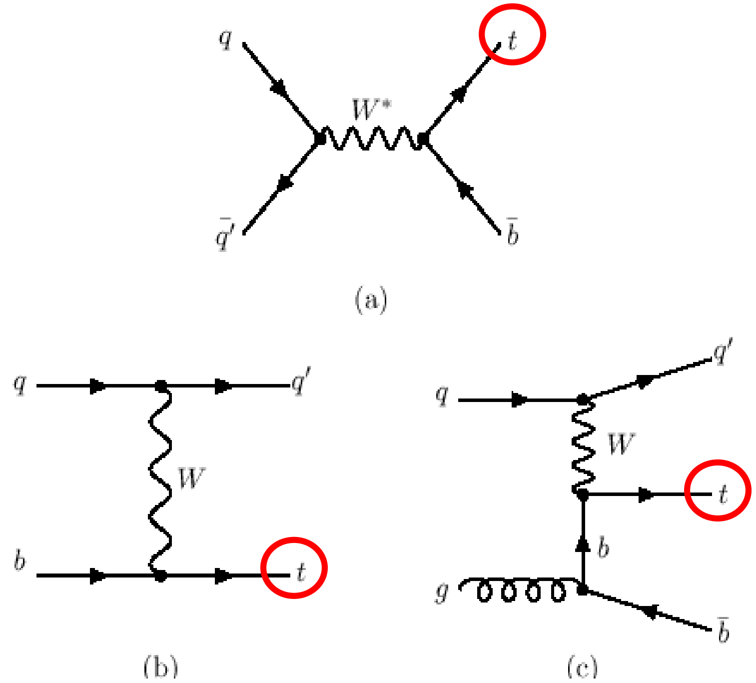
DØ Dileptons 90-107 pb^{-1}	$8.7^{+6.4}_{-4.7}(stat)^{+2.7}_{-2.0}(syst) \pm 0.9(lum)$
CDF Dileptons 126 pb^{-1}	$7.6^{+3.8}_{-3.1}(stat)^{+1.5}_{-1.9}(syst)$
CDF L+Track 126 pb^{-1}	$7.3 \pm 3.4(stat) \pm 1.7(syst)$
DØ L+jets/CSIP 45 pb^{-1}	$7.4^{+4.4}_{-3.6}(stat)^{+2.1}_{-1.8}(syst) \pm 0.7(lum)$
DØ L+jets/SVT 45 pb^{-1}	$10.8^{+4.9}_{-4.0}(stat)^{+2.1}_{-2.0}(syst) \pm 1.1(lum)$
DØ L+jets/topo 92 pb^{-1}	$4.6^{+3.1}_{-2.7}(stat)^{+2.1}_{-2.0}(syst) \pm 0.5(lum)$
DØ L+jets/soft muon 92 pb^{-1}	$11.4^{+4.1}_{-3.5}(stat)^{+2.0}_{-1.8}(syst) \pm 1.1(lum)$
DØ L+jets combined 92 pb^{-1}	$8.0^{+2.4}_{-2.1}(stat)^{+1.7}_{-1.5}(syst) \pm 0.8(lum)$
CDF L+jets/SVX 57 pb^{-1}	$5.3 \pm 1.9(stat) \pm 0.9(syst)$
CDF L+jets/HT 126 pb^{-1}	$5.1 \pm 1.8(stat) \pm 2.1(syst)$
DØ Combined 90-107 pb^{-1}	$8.1^{+2.2}_{-2.0}(stat)^{+1.6}_{-1.4}(syst) \pm 0.8(lum)$

Cross Section √s Dependence

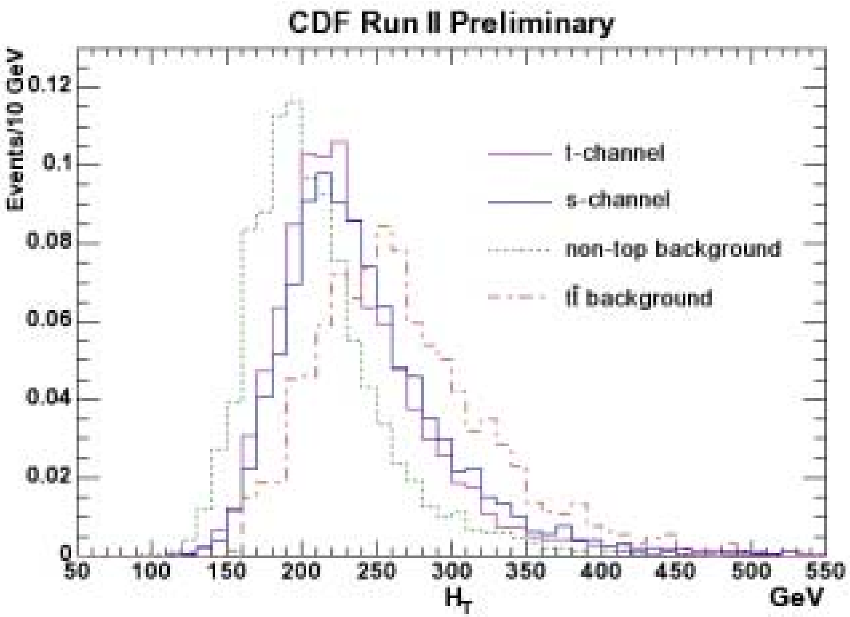


Single Top Physics

- **Production cross section about ½ of tt**
  - **Same signature as SM Higgs associated production:**
    - **W+2 jets**
  - **Single top samples have less objects in the final state:**
    - **larger background**



W-g channel	$\sigma = 1.70 \pm 0.09$ pb	(LHC: 244 pb)
*s-channel W**	$\sigma = 0.73 \pm 0.04$pb	(LHC: 10 pb)

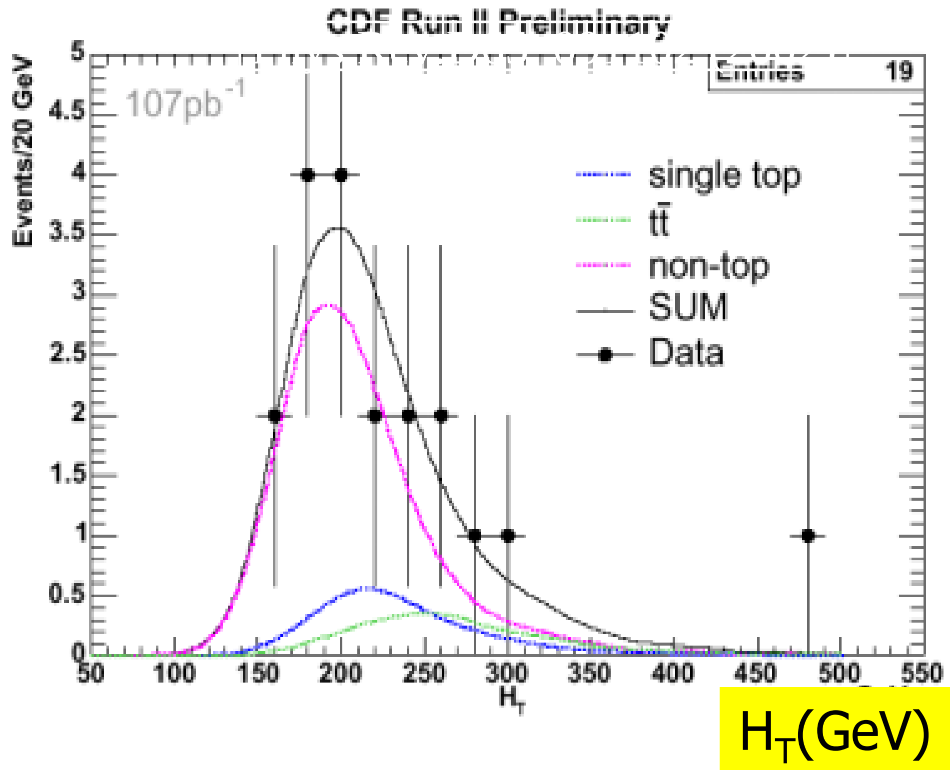


Uncertainty	$2fb^{-1}$
$\delta\sigma$ (tbX)	26%
$\delta\Gamma$ ($t \rightarrow Wb$)	28%
$\delta\lvert V_{tb}\rvert$	14%

Search for Single top in Run II

- **Main measurements: production cross section(s) → V_{tb}, mass:**
  - **Two production modes, different sensitivities to new physics:**
    - **t-channel:anomalous couplings, FCNC**
    - **s-channel: new charged gauge bosons**
- **In Run I a separate search (CDF,D0) and combined (CDF) have been performed**
  - **Same method is applied in RunII for these preliminary results:**

σ_t(t-channel)<15.4pb @95% C.L.

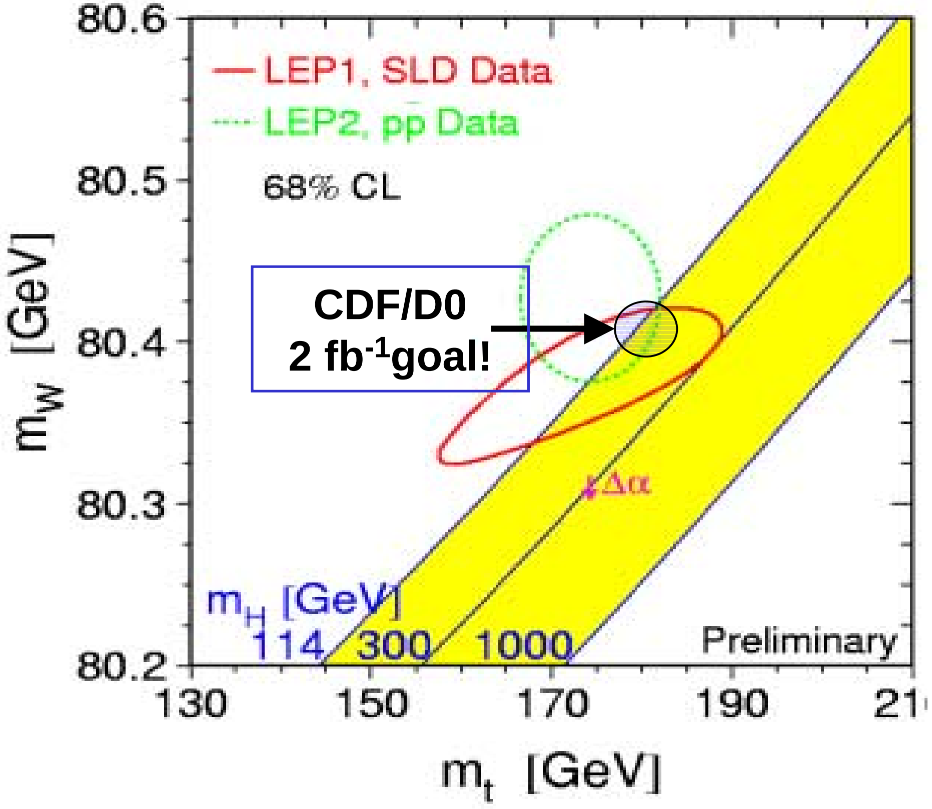


σ_t(combined)<17.5pb @95% C.L.

Top Mass

- **Top Mass: Fundamental SM parameter**
  - needed to determine ttH coupling
  - important in radiative corrections:

constrain $\Delta M_h / M_h$ to 35% in RunII



- **Experimentally:**
  - B tagging: reduce background & combinatorial
  - Data driven systematics scale with $1/\sqrt{N}$ (energy scale, gluon radiation)

Top Mass Measurement

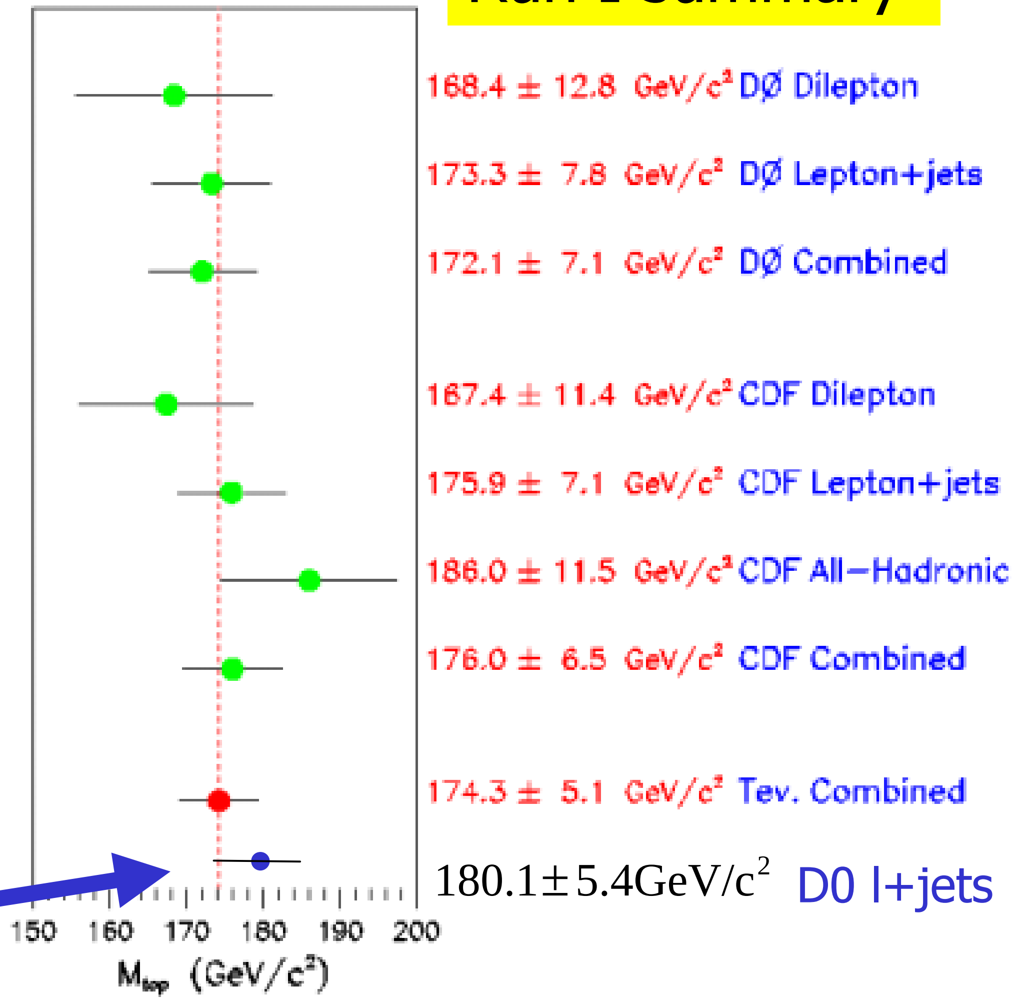
Template method:

- Kinematic fit under the tt hypotesis
- Combinatorial issues
- best χ^2 combination chosen
- Likelihood fit

Dynamical method:

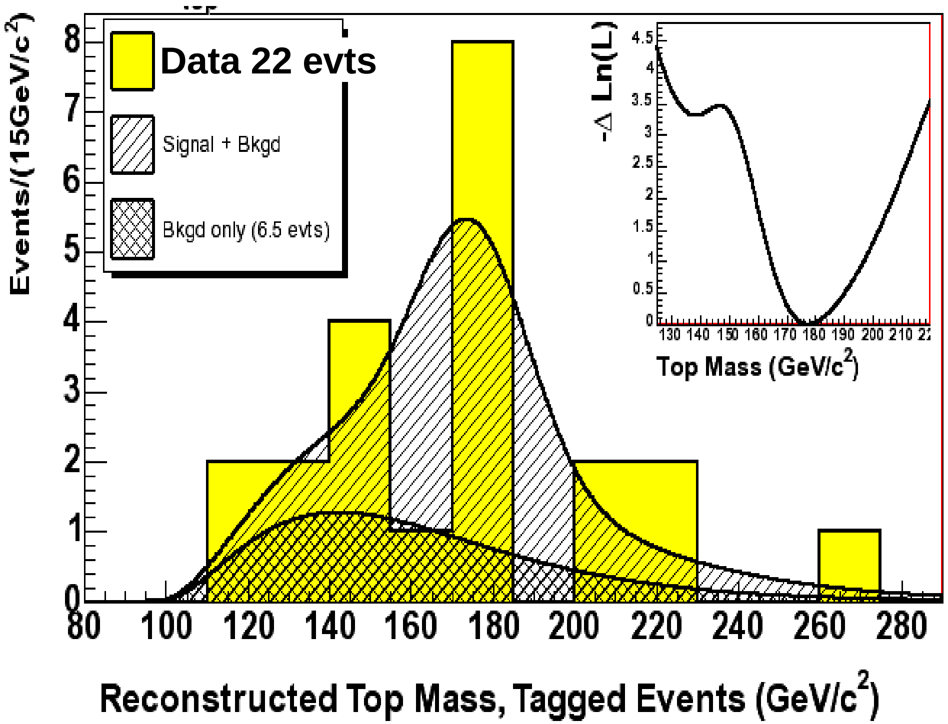
- Event probability of being signal or background as a function of m(t)
- Better use of event information → increase statistical power
- Well measured events contribute more
  - **New D0 Run I result:** factor 2.5 improvement on the statistical uncertainty!

Run I summary

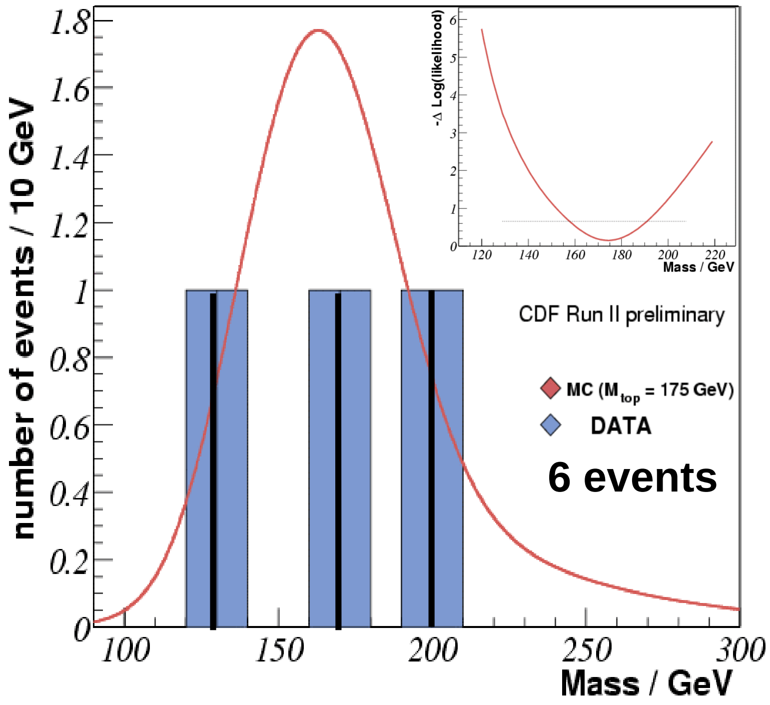


First Look at Top Mass in Run II

CDF RunII preliminary, 108 pb^{-1}



CDF RunII preliminary, 126 pb^{-1}



Mass in lepton+jets channel with a b-tagged jet

$$177.5^{+12.7}_{-9.4}\,(\mathrm{stat}) \pm 7.1(\mathrm{syst}) \quad \mathrm{GeV/c^2}$$

Mass in dilepton channel

$$175.0^{+17.4}_{-16.9}\,(\mathrm{stat}) \pm 7.9(\mathrm{syst})\ \mathrm{GeV/c^2}$$

Top: Conclusions

- Top quark existence established at the Tevatron in 1995
- Several top properties studied using Run I data
  - limited statistic
- The Tevatron is the top quark factory until LHC:
  - Run II ~50 times Run I statistics → precision measurements
  - Constraints on the SM Higgs boson mass and SM consistency
  - …or surprises?
  - First Run II results cover a variety of channels and topics
  - CDF and D0 are exploiting their upgraded detector features

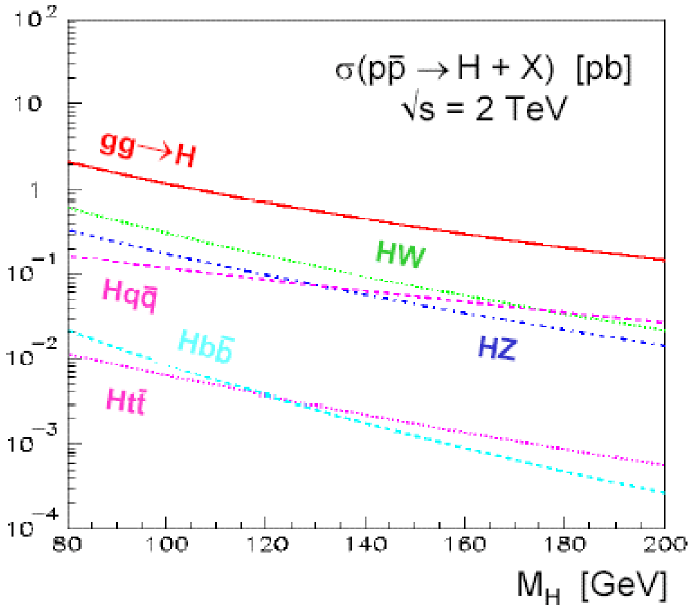
A rich top physics program is underway

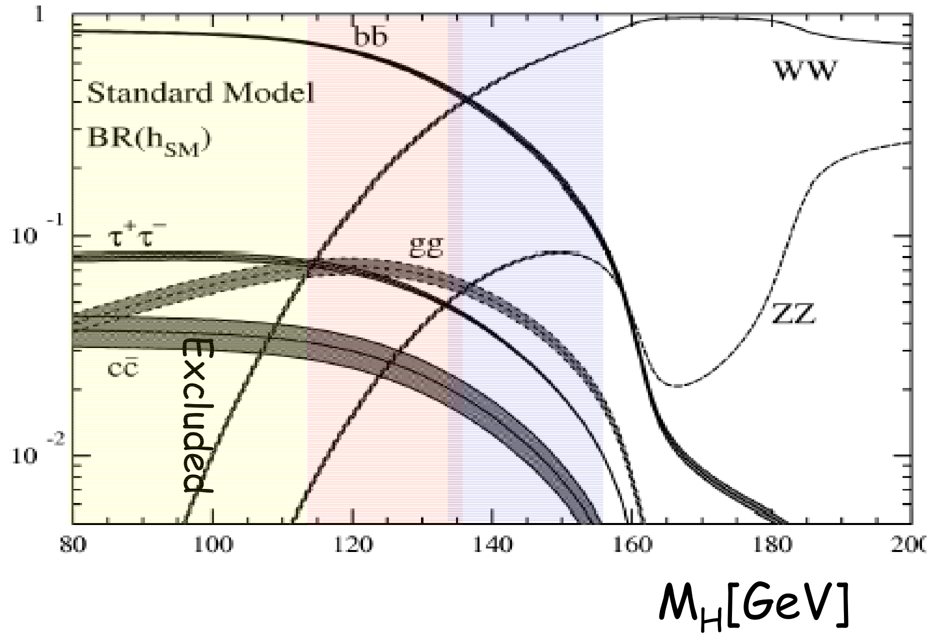
Higgs Searches

- SM Higgs Boson:
  - m_H > 114.4 GeV (95% CL) Direct searches by LEP
  - m_H < ~200 GeV Indirect result from fit to data
- Many additional Higgs bosons in other models
- Searches are underway at the Tevatron
  - Several fb^{-1} of data needed for observation
  - Non SM processes enhance cross section
- Run II will provide stringent constraints to SM Higgs
  - δM_t < 2.5 GeV per exp (currently 5.1 GeV – combined)
  - δM_W < 40 MeV per exp (currently 59 MeV - combined)

Higgs Decays

Search strategies are a function of Decay Channel and Production Channel





Low Mass Higgs Searches

$$m_H < 135\ GeV$$
$$ZH,\ WH \quad H \rightarrow b\bar{b}$$

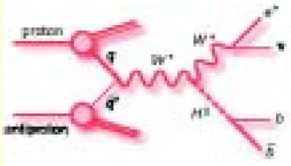
High Mass Higgs Searches

$$m_H > 120\ GeV$$
$$gg \rightarrow H \rightarrow WW^*$$

W(eν or μν)+Jets

Electron selection

- $|\eta_e|<0.8$, $E_{Te}>20$ GeV
- $\not\!\!E_T>25$ GeV



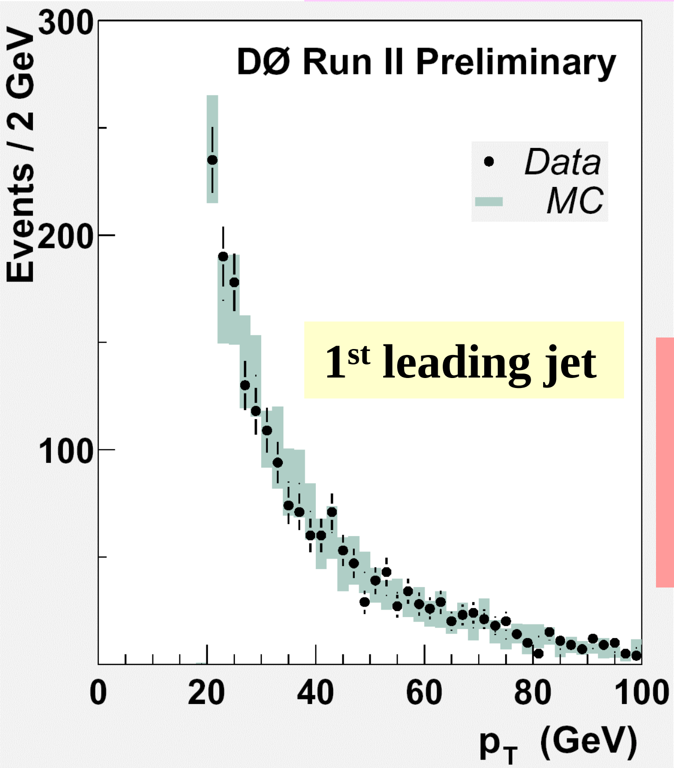
Muon selection

- $|\eta_\mu|<1.5$, $p_{T\mu}>25$ GeV
- $\not\!\!E_T>20$ GeV

$W \to e\nu$

Jet selection

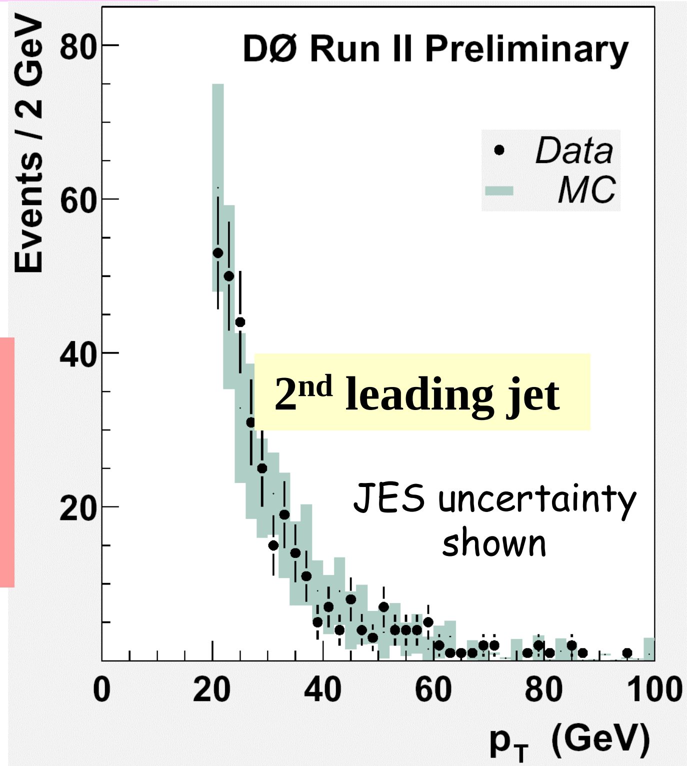
- $|\eta_{jet}|<2.5$, $E_{Tjet}>20$ GeV



$W \to \mu\nu$

Combined

MC=PYTHIA + Detector Simulation

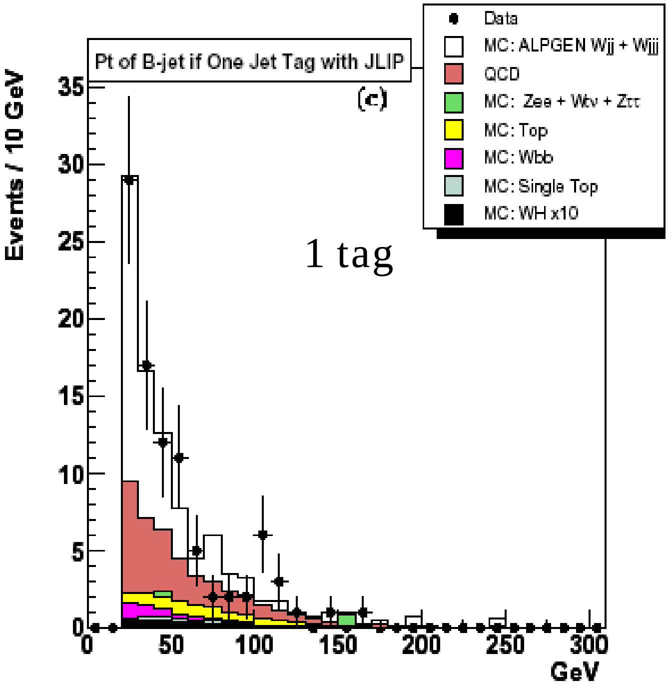


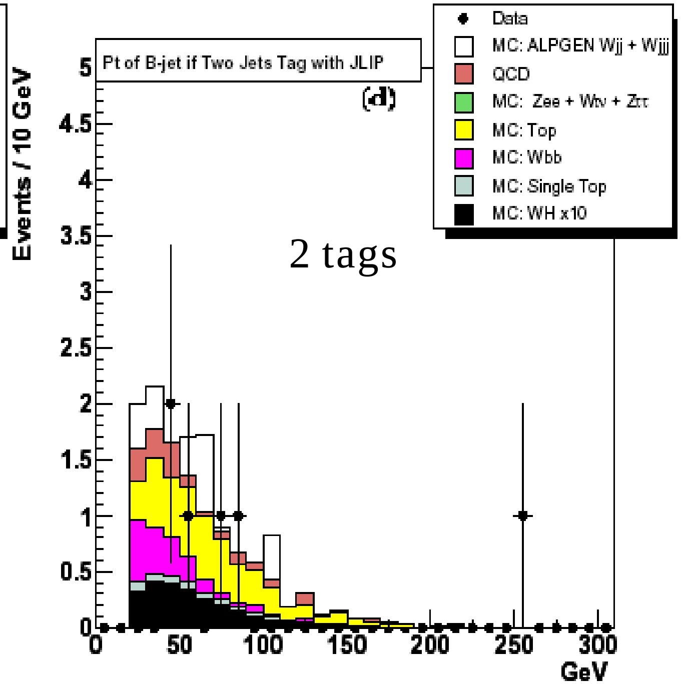
Gregorio B

DØ : Searching for the Higgs

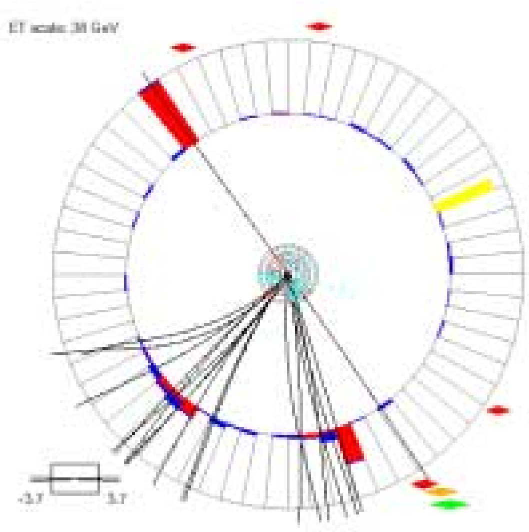
W(eν)+b$\bar{b}$ cross section: 117 pb^{-1}

- important background for single top and Higgs searches
- benchmark for detector performance
- 92 evts with 1 impact parameter tag





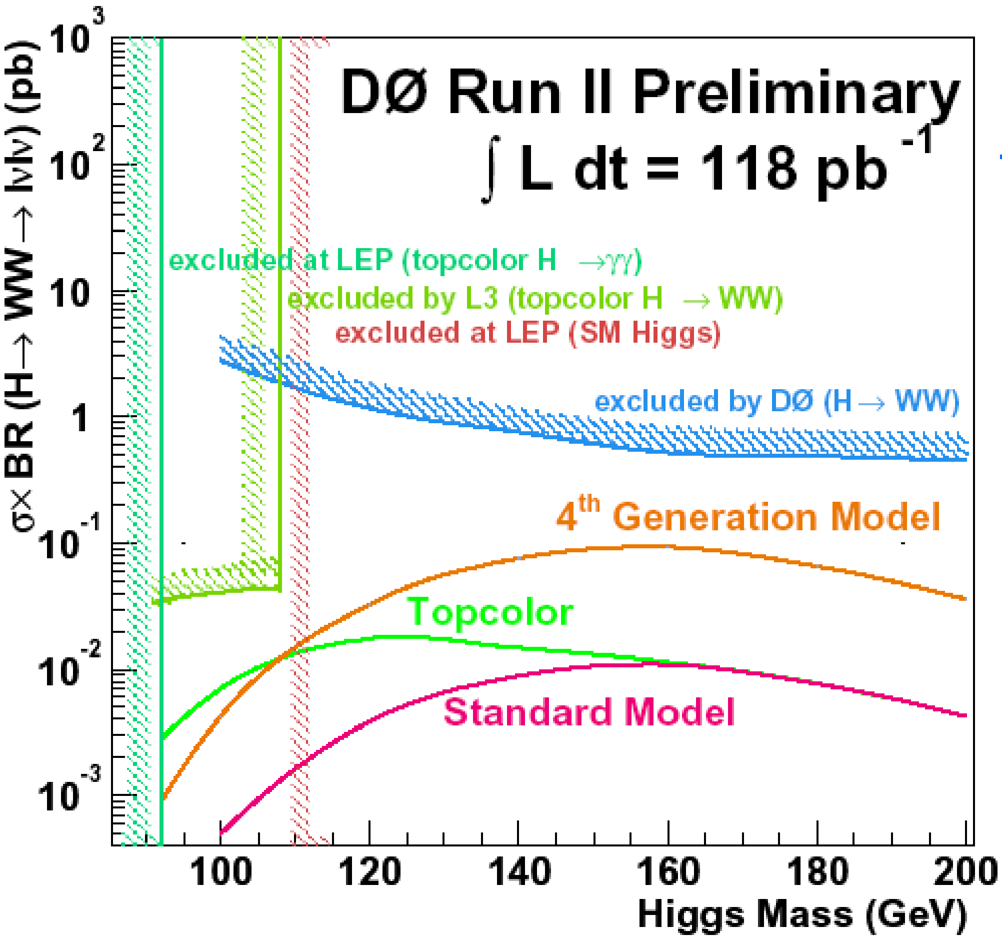
double IP tag event



- search for double impact parameter tagged events
  - 3 evts observed, 5.5 ± 1.6 evts background

σ(W+bb) < 33.4 pb @ 95% CL

$H \rightarrow WW$



ee (eμ) final states

118 (102) pb^{-1}

– **events observed**

***ee*: 0 obs., 1.1 ± 0.8 background**

***eμ*: 1 obs., 0.9 ± 0.5 background**

σ*BR < 0.45 pb to 2.8 pb

di-muon final state

first time studied for H->WW

114 pb-1, 1 event observed,

exp. Bckgd:

0.95 ± 0.12 (stat.) ± 0.14 (sys.)

σ*BR < 0.2 pb to 0.7 pb

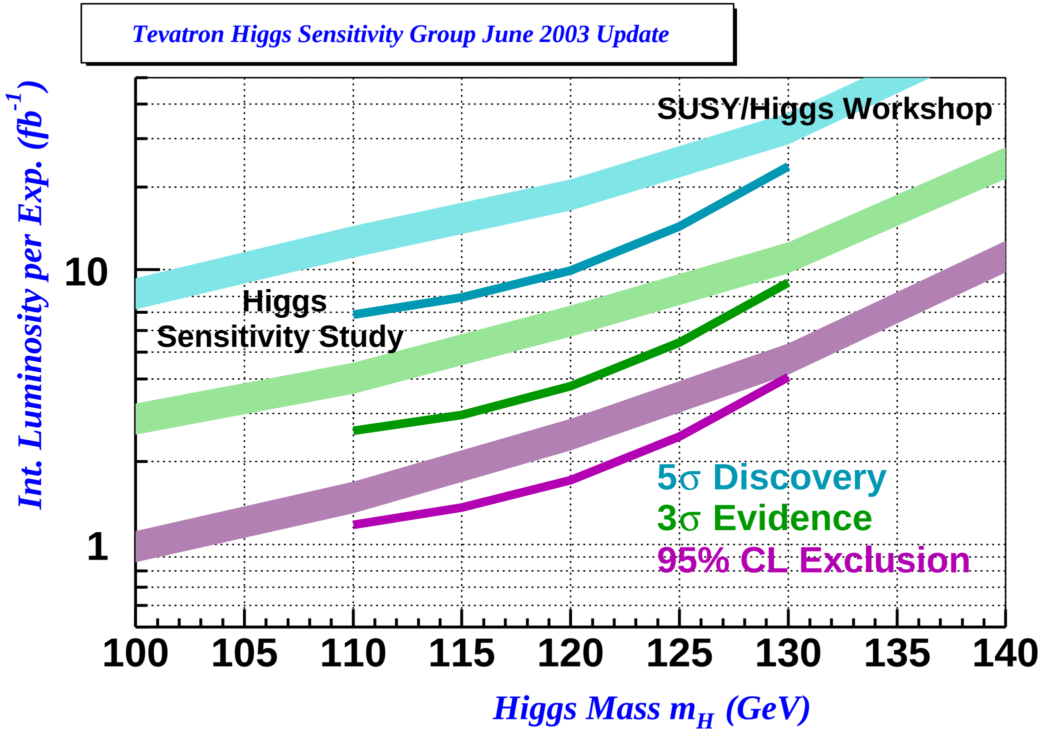
Future Prospects

- **Long term: reaching 4-8 fb^{-1} by FY09**
  - **Detector upgrades for FY06 (Si (tbc), trigger)**

SUSY/Higgs Workshop:

hep-ph/0010338

Tevatron Higgs Sensitivity Group:
June 24, 2003
- WH→lνbb
- ZH →ννbb
- Improvement due mainly to sophisticated analysis techniques



Conclusion

- **Many new results on b-physics, QCD , electroweak, Higgs, Top and New Phenomena have been obtained with more than 100 pb^{-1} of luminosity integrated during Run II (i.e. similar to Run I lumi)**

- **Many already exceeding Run I reach**

- **Coming months bringing Run II into frontier physics**

- **Rendez-vous at the winter 2004 conferences with a luminosity 2-3 times higher than previously achieved in Run I. Let's hope for good surprises!**