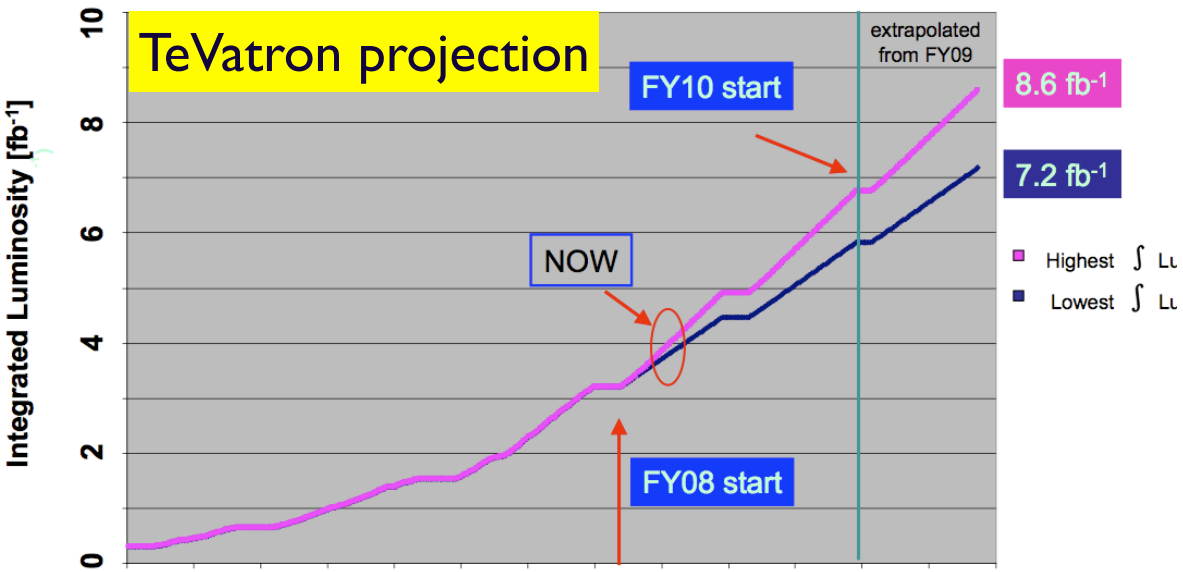
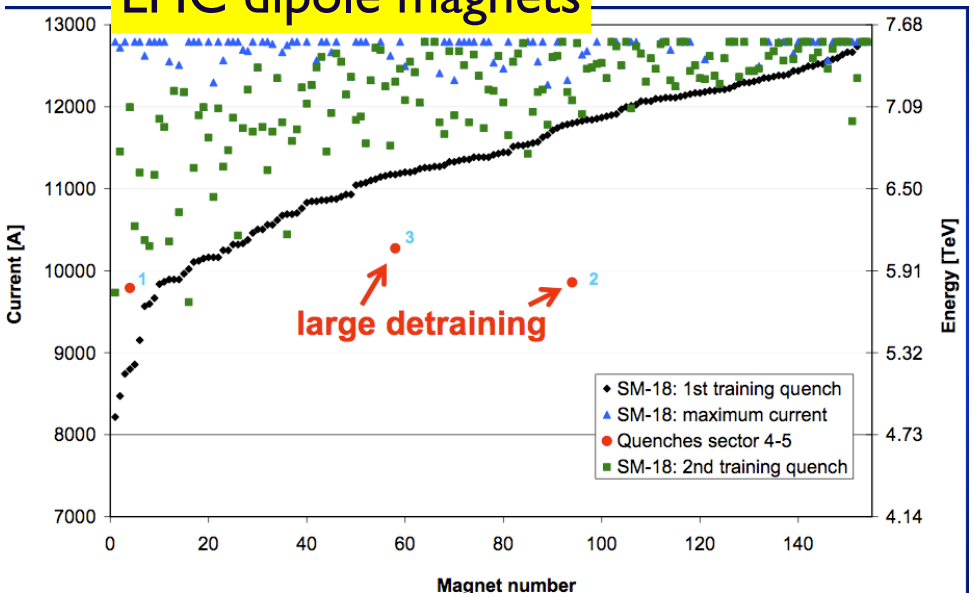
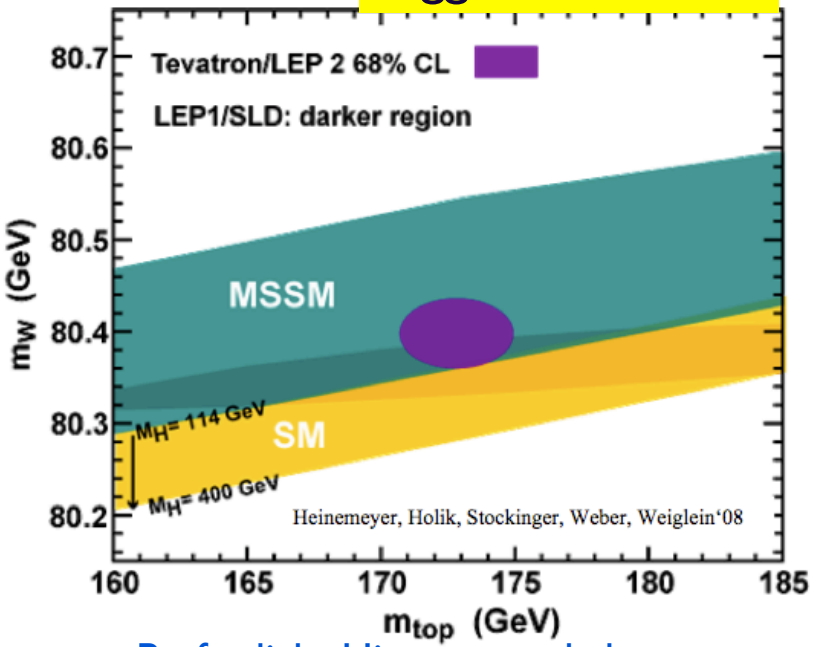
Tevatron Status and LHC Schedule



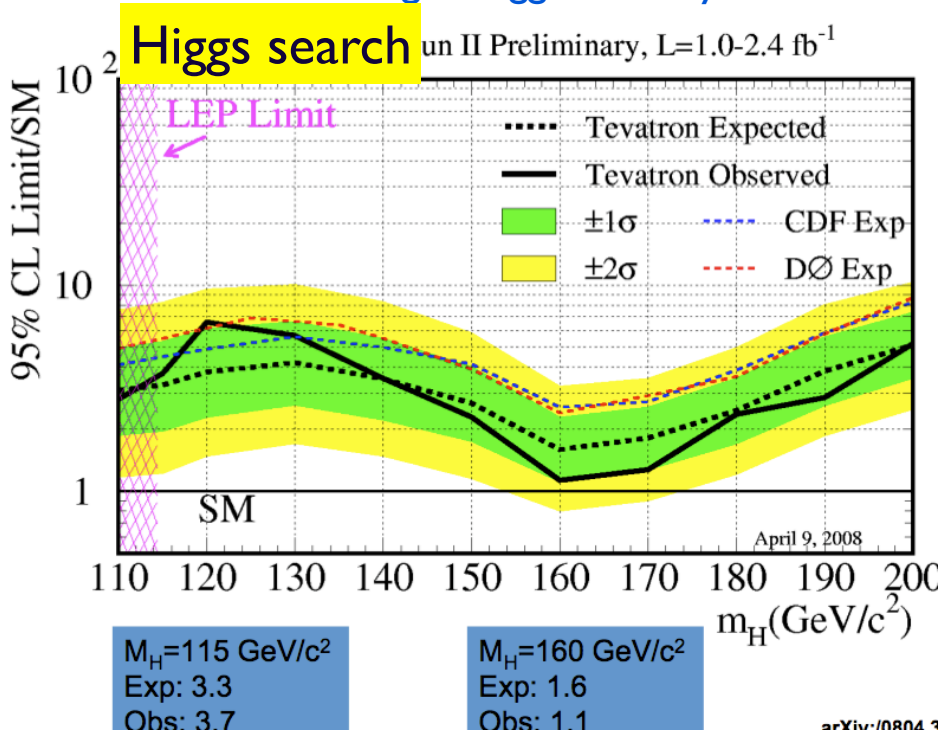
Discussion ongoing for an additional year to 2010



Plan foresees 6 weeks of running at 5 TeV. IntL ~10's pb-1, no squeeze, no crossing angle, Lumi 10^{31}, 43 bunches, 75 ns



Prefer light Higgs=> study low mass



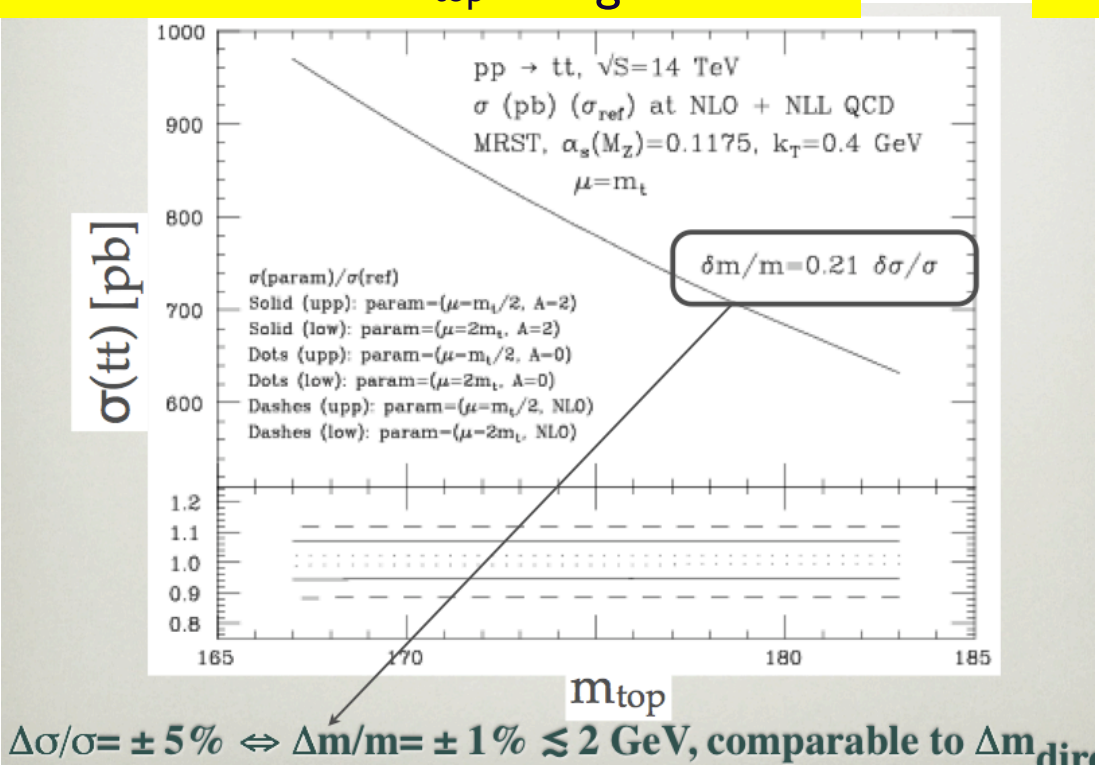
M_H=115 GeV/c^2
Exp: 3.3
Obs: 3.7

M_H=160 GeV/c^2
Exp: 1.6
Obs: 1.1

arXiv:/0804.3

$t\bar{t}$ theoretical cross section and uncertainties at LHC

cross section vs m_{top}: using the xsec?



Note: at 10 TeV the xsec is 414 pb +/-10%

Scale and PDF uncertainties the theory xsec

PDF UNCERTAINTIES

Tevatron

CTEQ6.5 $\sigma = 7.61\ ^{+0.38(5.1\%)}_{-0.80(10.9\%)}$ (scales) $^{+0.49(6.6\%)}_{-0.34(4.6\%)}$ (PDFs) pb

MRSTW-06 $\sigma = 7.93\ ^{+0.34(4.3\%)}_{-0.56(7.1\%)}$ (scales) $^{+0.24(3.1\%)}_{-0.20(2.5\%)}$ (PDFs) pb.

MRST–CTEQ = 0.32 ± 0.45 pb

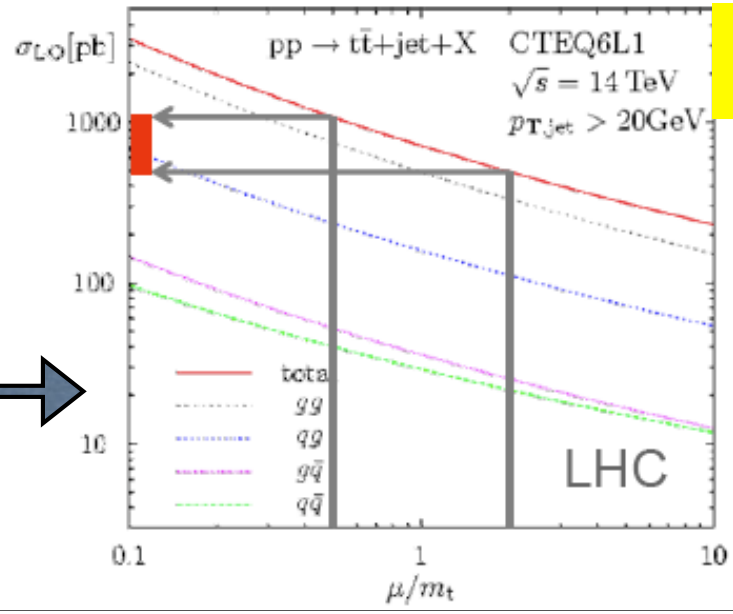
LHC

CTEQ6.5 $\sigma = 908\ ^{+82(9.0\%)}_{-85(9.3\%)}$ (scales) $^{+30(3.3\%)}_{-29(3.2\%)}$ (PDFs) pb

MRSTW-06 $\sigma = 961\ ^{+89(9.2\%)}_{-91(9.4\%)}$ (scales) $^{+11(1.1\%)}_{-12(1.2\%)}$ (PDFs) pb

MRST–CTEQ = 53 ± 33 pb

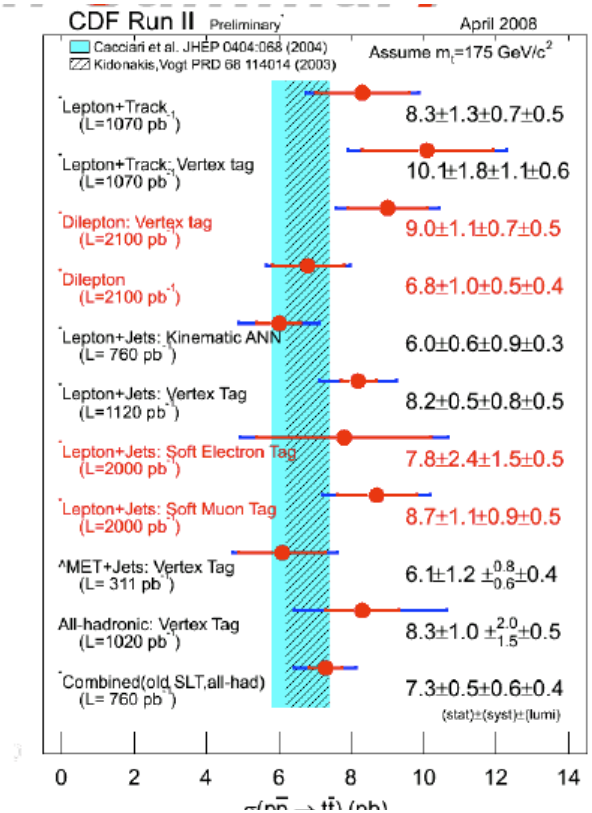
scale dep. of order +/-5-9% and PDFs likely underestimated



LO tt+jet+X cross section

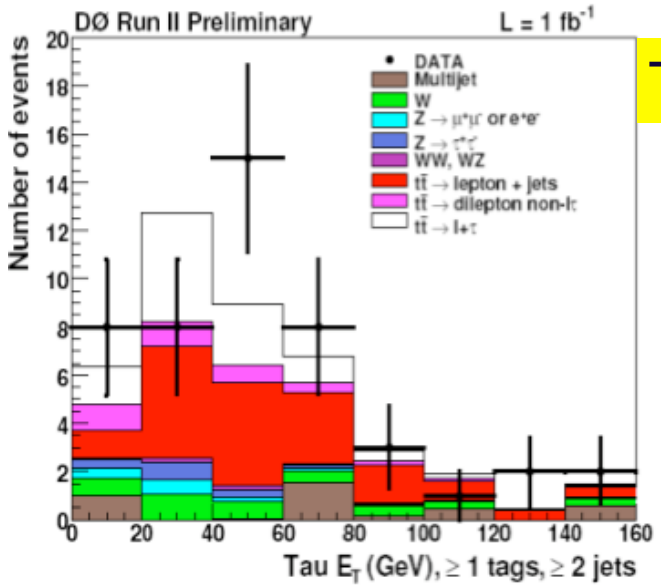
Currently NLL
Recent progress (Uwer) towards full NNLO, but a long way still to physical xsections: LO ttbar+1jet cross section (preliminary): strong scale dependence, large cross section.

Experimental Cross Sections: Tevatron and LHC prospects

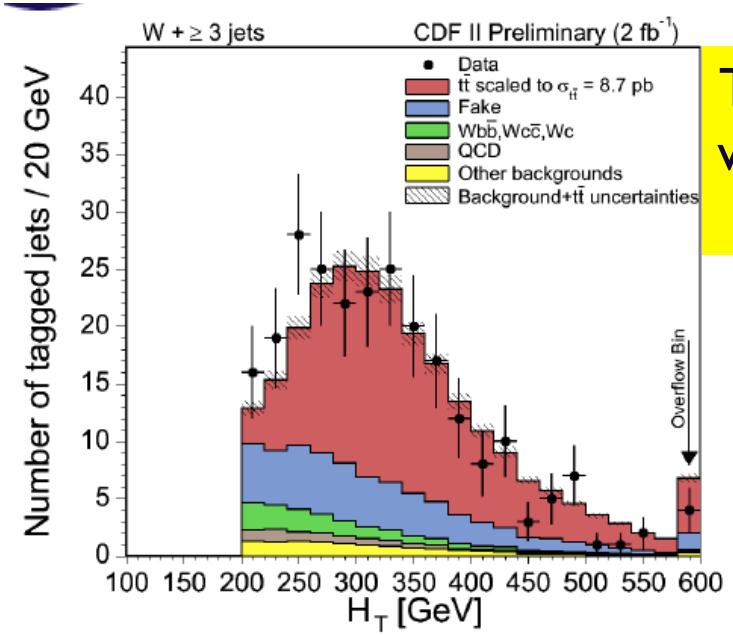


Top pair cross sections

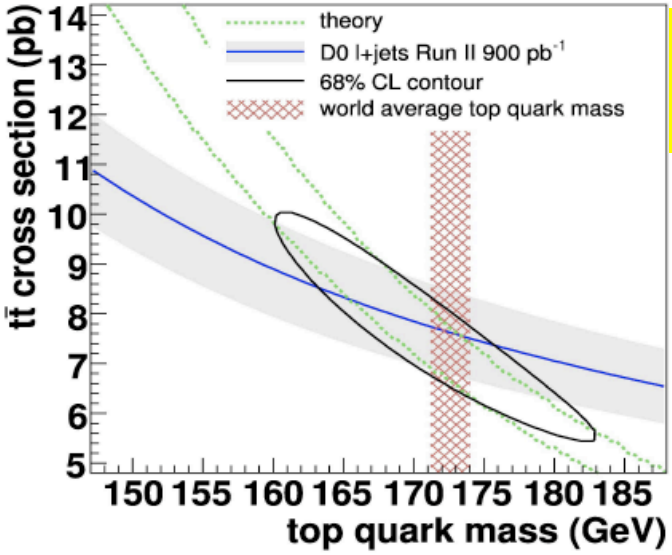
+/-10% precision



Top with τ's



Top cross section with semileptonic b-decay

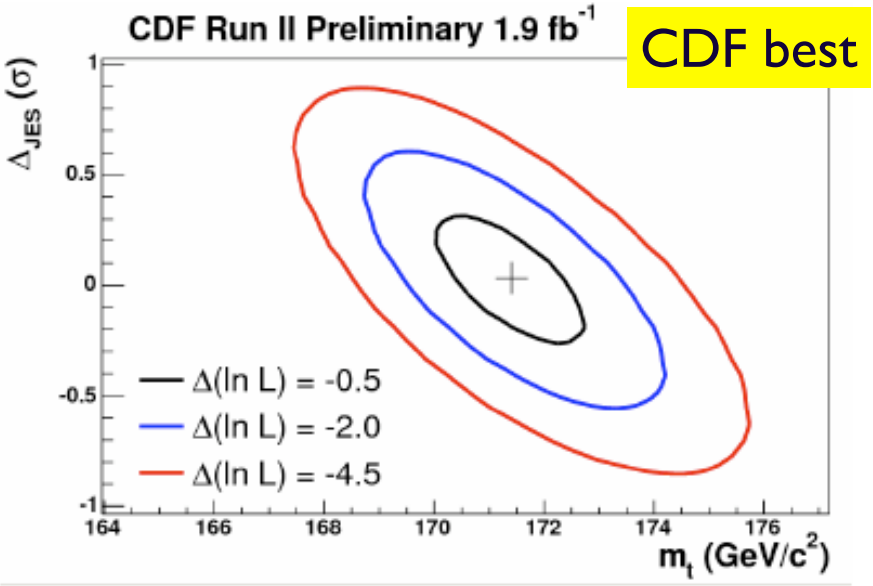


Top mass from cross section

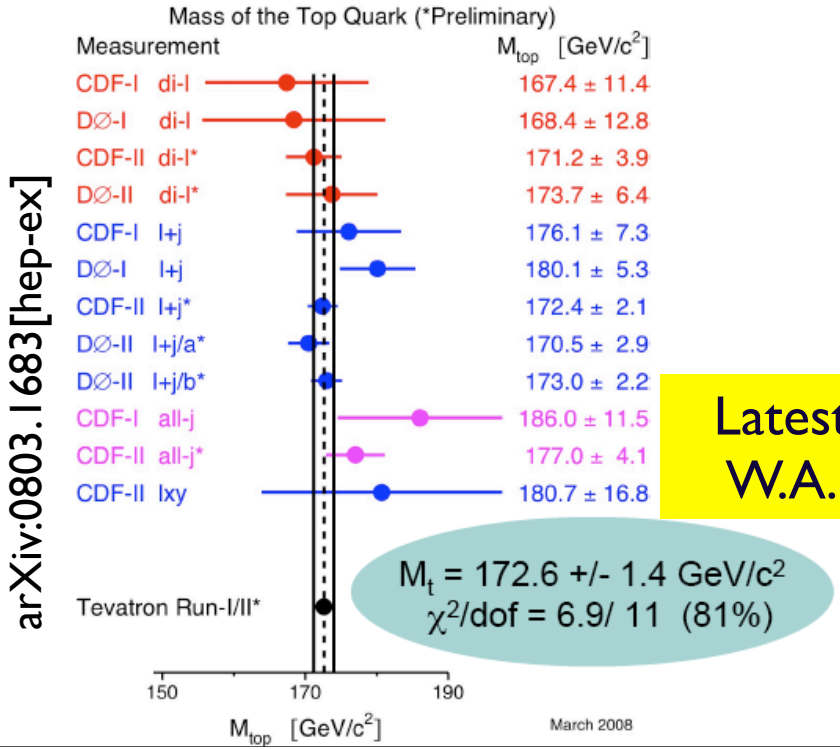
m_t = 170.0 ± 7 GeV @ 68% C.L.

D0 combined, 1 fb^{-1}: 172.1± 2.4 GeV

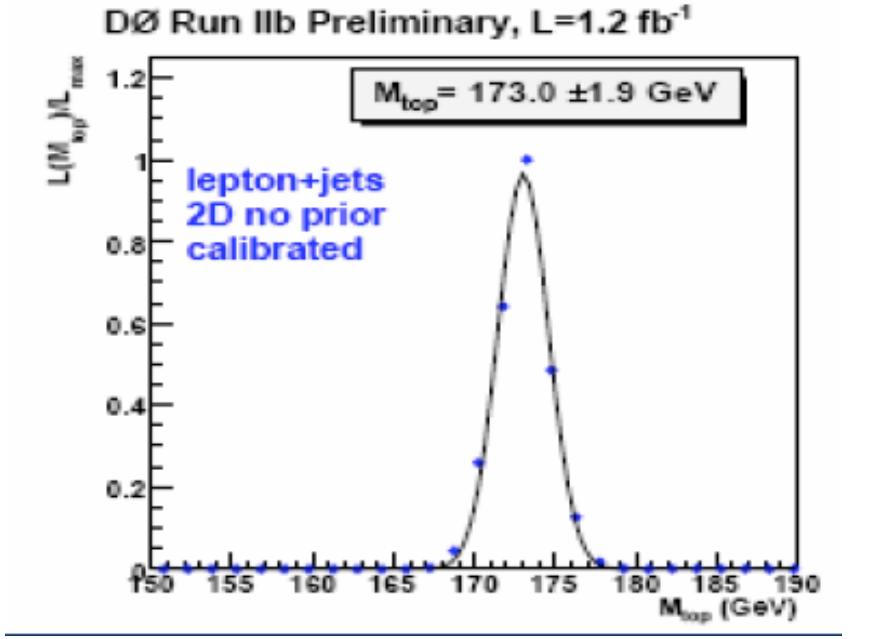
Top Mass measurements:



ME: 171.4+/-1.5(stat+JES)+/-1.0(sys) GeV



Latest W.A.



The uncertainty: total combined is 0.8%, from MC modeling is 0.3%

HOWEVER:

-Color Reconnection is currently not included in the syst

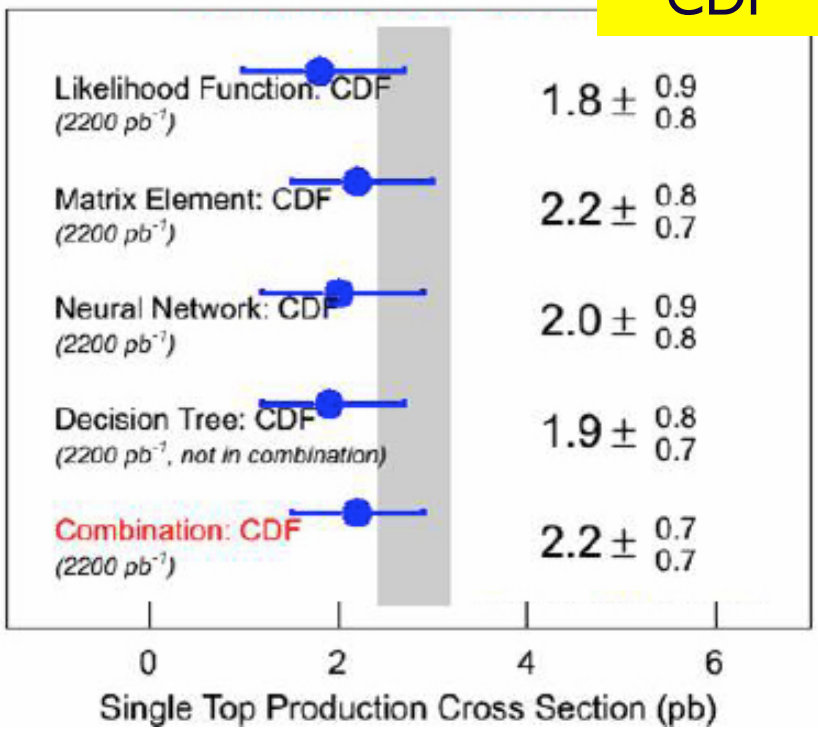
-ISR/FSR/Had included in JES, and again in Signal Modeling

Overall the definition of measured top mass is ~ the pole mass. However more and more attention is being paid to the color reconnection. PYTHIA now allows to change the CR... more accurate systematics will be evaluated.

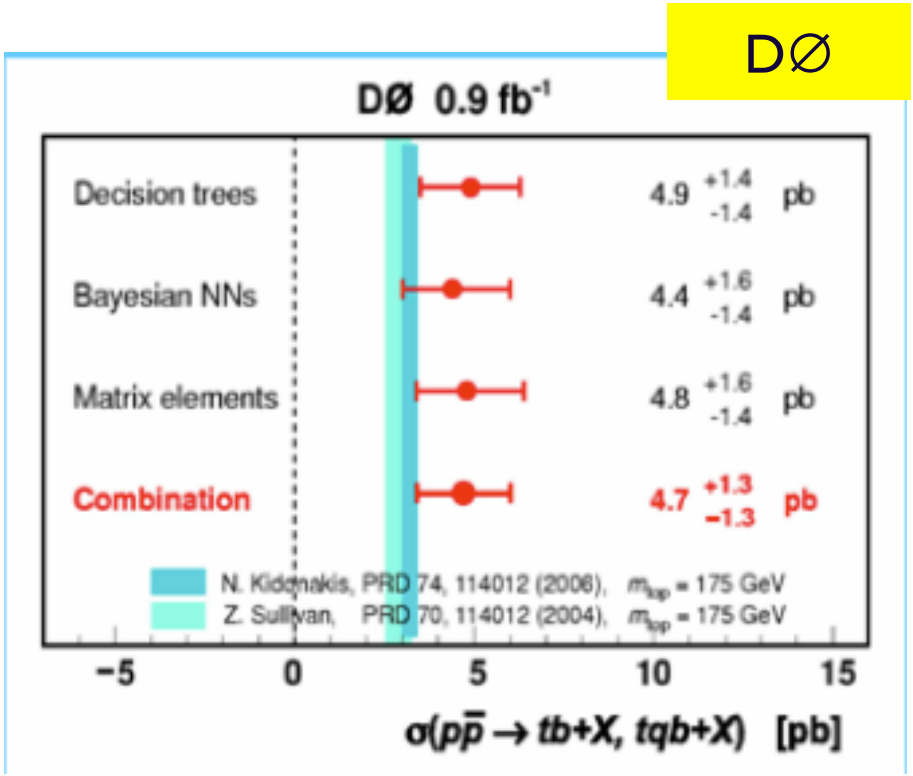
Note: HERWIG 6.1.4mc+ allows a new talk-to for colour rearrangement (not clear to me if it includes connection with UE)

Single Top at CDF and DØ

CDF



DØ



$|V_{tb}f_1^L|=1.3+/-0.2$
or $|V_{tb}|>0.68$ @ 95% CL

Also use these data to exclude (W', H^c)->tb
Phys Lett B655, 245, 2007

H1 searched for anomalous single *top* production in ~0.5 fb^{-1} (expect the result with ~ 1fb^{-1} later on)

$$\sigma(ep \to etX) < 0.16 \text{ pb}$$

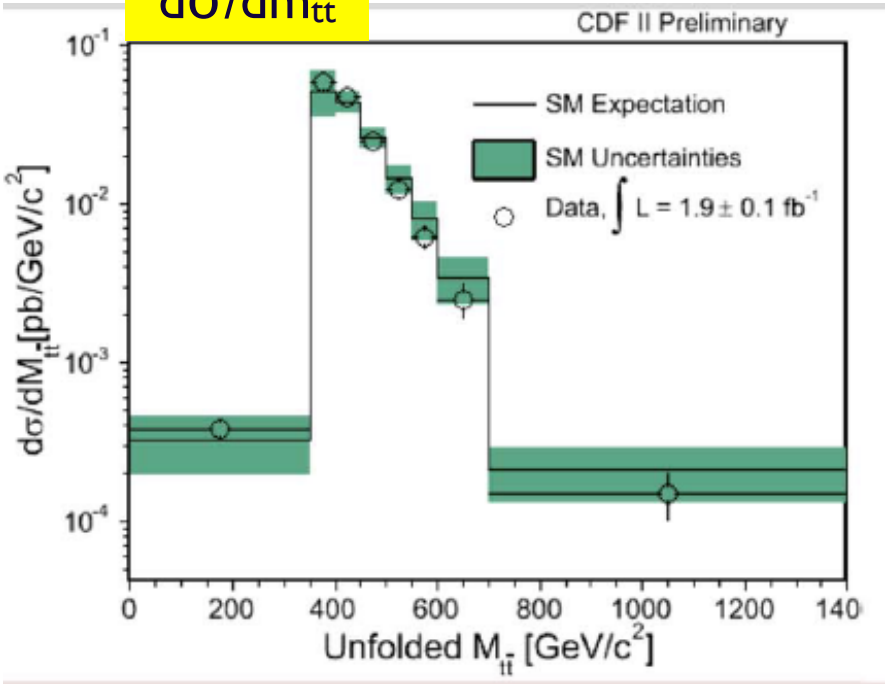
$$\kappa_{tuy} < 0.14$$

upper bound on the anomalous coupling

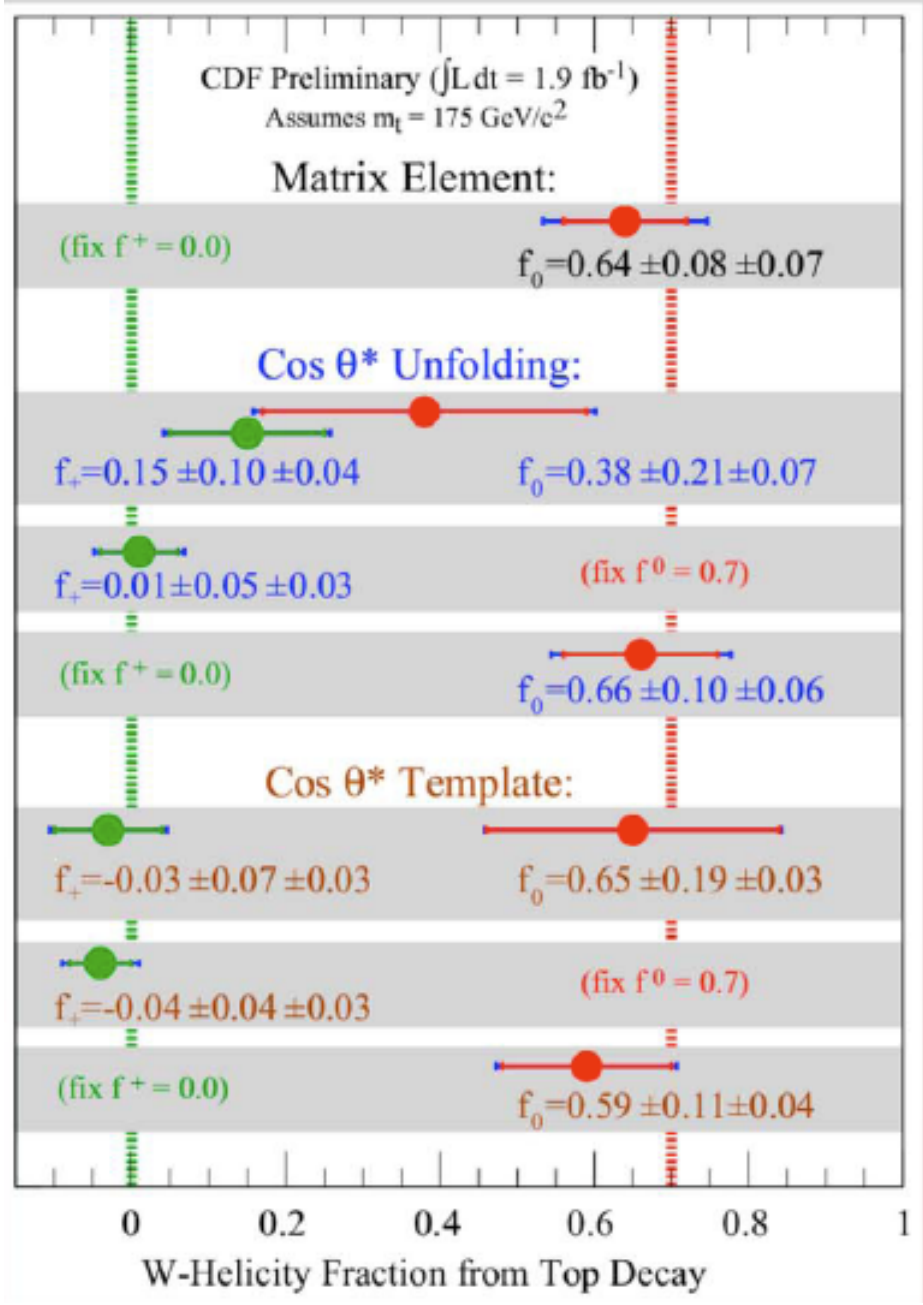
THEORY
-New Calculation of single top t-channel production without using the b-quark PDF (use the gluon, then do the spit) (Campbell, Frederix, Maltoni)
-EW correction: O(5%) overall (Mirabella et al)

Top Quark Properties

dσ/dm$_{tt}$



W-Helicity in top decay



Top forward/ backward