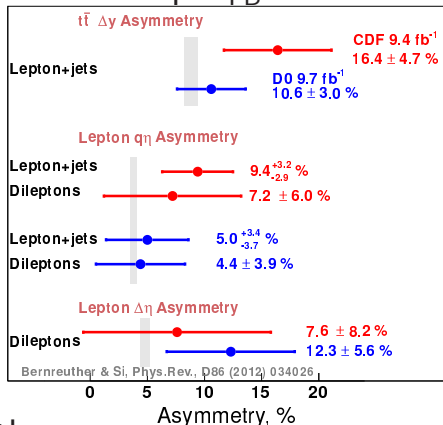


Top A_{FB} Tevatron combination

- Thoughts on what the final paper will contain
 - Three measurements: $A_{\text{FB}}^{t\bar{t}}$, A_{FB}^{ℓ} and $A_{\text{FB}}^{\ell\ell}$
 - Inclusive and differential
 - Both experiments and both channels
- The goal is to make the paper mostly the plots and tables and keep the text short and sweet
- Writing down my best understanding of where we are today as well as some recent developments and results I have

Top A_{FB} Tevatron combination

Summary of all three Top A_{FB} measurements

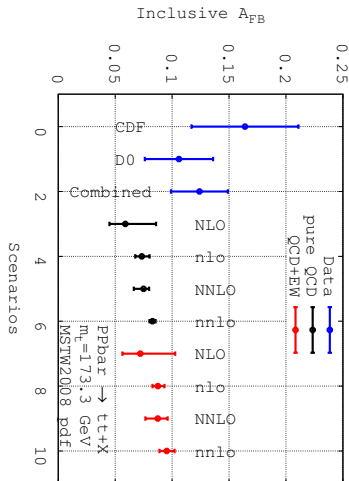


Need to add three more:

- Recent D0 DIL result: $A_{FB}^{t\bar{t}} = (18.0 \pm 8.6)\%$
- CDF DIL $A_{FB}^{t\bar{t}}$ measurement well underway
- NNLO QCD calculation

NNLO A_{FB}^{ℓ} Prediction

- Update the theory predictions to incorporate new results
- NNLO QCD + LO EW
 $\rightarrow A_{\text{FB}}^{t\bar{t}} = 0.095 \pm 0.007$
- Czakon, Fiedler and Mitov,
 arXiv:1411.3007
- No NNLO prediction for A_{FB}^{ℓ} and $A_{\text{FB}}^{\ell\ell}$ yet
- Deviation between measurements and prediction no longer significant



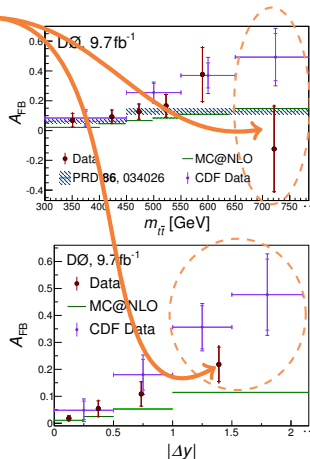
$A_{\text{FB}}^{t\bar{t}}$ Tevatron combination

- Status of each of the three combinations. Start with inclusive $A_{\text{FB}}^{t\bar{t}}$
- 3 out of 4 results available (CDF DIL coming soon)
- Previous discussed systematic correlation in $l+\text{jets}$ summarized in the table below
- Need numbers, final CDF-DIL results and a decision about how to combine
- Who will make the final calculation?

Experiment	$A_{\text{FB}}^{t\bar{t}}$	Stat. uncertainty	Syst. uncertainty
CDF $l+\text{jets}$	0.164	0.039	0.026
D0 $l+\text{jets}$	0.106	0.027	0.013
D0 DIL	0.180	0.061	0.032
CDF DIL	Coming		

CDF $l+\text{jets}$	D0 $l+\text{jets}$	D0 DIL	CDF DIL	Correlation
Background shape/normalization (0.022)	background model/sample composition (0.01?)			0
Parton shower/IFSR (0.011)	Signal model (0.005)			1
JES (0.007)	Detector model (0.003)			0
Correction procedure (0.004)	Unfolding (0.005)			0
Color reconnection (0.001)	-			-
PDF (0.001)	PDF and pileup (0.004)			1

- Differential distributions have different trends
- Ideally we would follow up on the differences in the last bins. Necessary in light of recent numbers from Mitov et al.?
- Do a differential combination differential, or just plot both on the same plot like on the right?
- Any other plots want to make?



$$A_{\text{FB}}^{\ell}$$

- A_{FB}^{ℓ} vs. $q_{\ell}\eta_{\ell}$ shows good agreement among all results

- Results to the right are

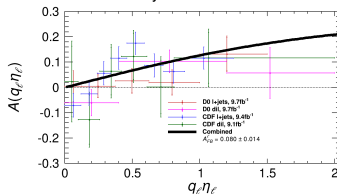
extrapolated A_{FB}^{ℓ} with $a \cdot \tanh(\frac{1}{2}\eta_{\ell})$

- Are the uncertainties on each bin from D0 l+jets and DIL stat. only or are syst. included?
- A straight simultaneous fit with stat. uncertainties only
 - Result yields 0.080 ± 0.014
- Need systematics
- Use this method of A_{FB}^{ℓ} combination?

A_{FB}^{ℓ} with $a \cdot \tanh(\frac{1}{2}\eta_{\ell})$ fit

Experiment	A_{FB}^{ℓ}	stat.	syst.
Simultaneous fit	0.080	0.014	
CDF l+jets	0.105	0.024	+0.022 -0.017
CDF DIL	0.072	0.052	0.030
D0 l+jets	0.049	0.029	
D0 DIL	0.068	0.032	

Tevatron Preliminary



- Break up syst. uncertainty in each bin, then do a simultaneous fit taken correlations into account?
- Need inputs from D0 l+jets and DIL, a table similar to the one below for **asymmetry in each bin**

Source of uncertainty	CDF L+J	CDF DIL	D0 L+J	D0 DIL	Correlation
Backgrounds					
Recoil modelling					
(Asymmetric modelling)					
Symmetric modelling					
Color reconnection					
Parton showering					
PDF					
JES					
IFSR					
Statistics					

- Do a simultaneous fit for $A_{\text{FB}}^{\ell\ell}$ vs. $\Delta\eta$?
- Also need statistical and systematic uncertainties for **asymmetry in each bin**

$A_{\text{FB}}^{\ell\ell}$ with $a \cdot \tanh(\frac{1}{2}\eta_\ell)$ fit

Experiment	$A_{\text{FB}}^{\ell\ell}$	stat.	syst.
CDF DIL	0.076	0.072	0.037
D0 DIL	0.110	0.047	

Source of uncertainty	CDF L+J	CDF DIL	D0 L+J	D0 DIL	Correlation
-----------------------	---------	---------	--------	--------	-------------

Backgrounds

Recoil modelling

(Asymmetric modelling)

Symmetric modelling

Color reconnection

Parton showering

PDF

JES

IFSR

Statistics

