

Next steps

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Open TOPLHCWG workshop

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Ongoing work

Combination results released so far (see [this URL](#))

- Top quark mass, 02-Jul-12
- $t\bar{t}$ cross-section, 17-Sep-12
- W helicity in top decays, 12-Mar-13

Hope to converge soon on

- single top cross section at 8 TeV
- top mass

From discussions yesterday

Top mass/hadronisation

- CMS is checking the differences Pythia/Herwig beyond JES
- Need to work on further common treatment of systematics

Single top extrapolation uncertainty

- Confirmed that $2 \rightarrow 3$ NLO (4FS) is best, and available in aMC@NLO
- Propose to unify „generator“ uncertainty
 - ATLAS: evaluate parton level, p_T (2nd b)
 - CMS: compare to generators at reconstruction level
 - could quote the largest of the two?

From discussions yesterday

Jet/ E_T^{miss}

- Concrete first proposal presented on how to map and join categories which have similar correlations
- CMS is evaluating effect of close-by jets
- Finalise and document in a Twiki and in a public document
- (Strongly) encourage its usage for EPS timescale results?

From discussions today

Common input definition for pseudo-top

- progress report on common definitions
- lepton definition
 - *isolation (brings experimental problems)*
 - *no isolation: need good definition of b's*
 - *tau's as background? not optimal in dilepton channel*
- include neutrinos in jet definition or not?
- need common jet radius (0.5)
 - *ATLAS working in this direction but will take time*

Complete NNLO calculation available

- uncertainty now $\sim 5\%$ for NNLO+NNLL
- implemented in Top++ („you cannot get a better deal“)

Possible combinations

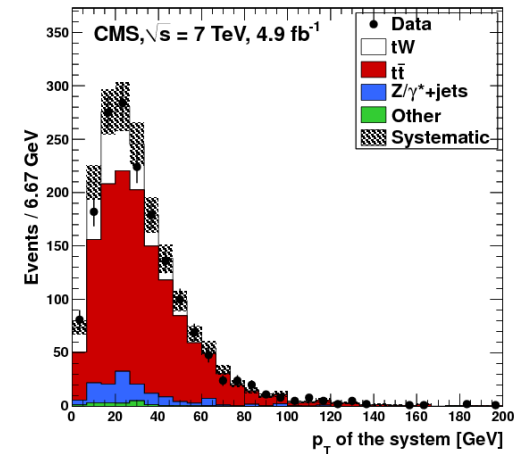
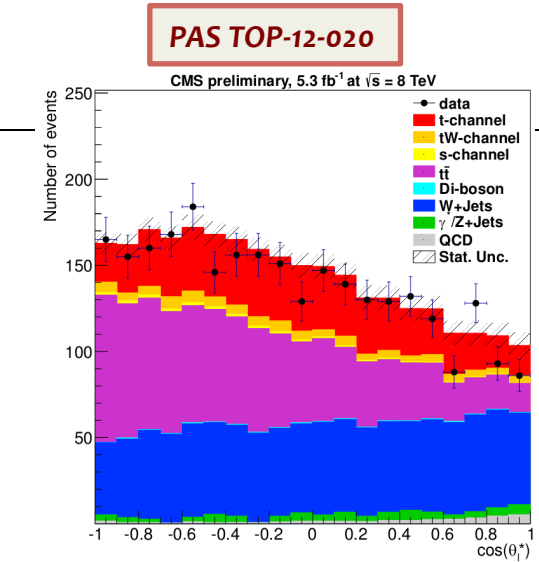
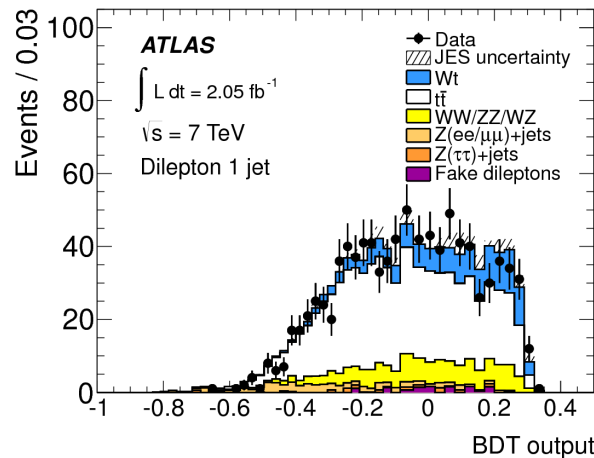
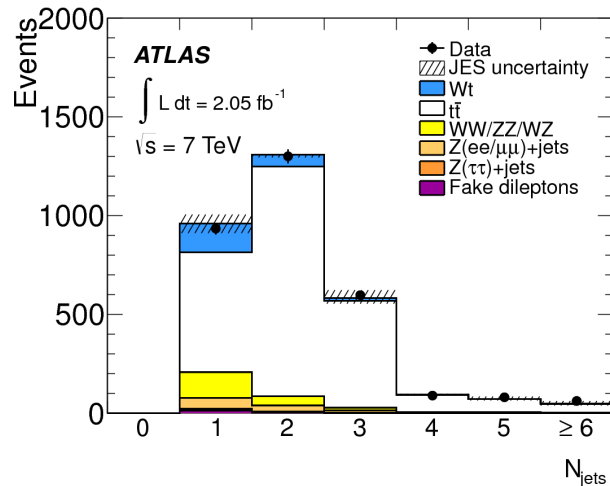
Single top measurements

- include single top $\cos\vartheta$ in Wtb structure
- Wt production?

$$\sigma_{Wt} = 16.8 \pm 2.9 \pm 4.9 \text{ pb (ATLAS)} \quad 3.3\sigma$$

$$\sigma_{Wt} = 16^{+5}_{-4} \text{ pb (CMS)} \quad 4.0\sigma$$

Phys. Lett. B 716 (2012) 142-159



Phys. Rev. Lett. 110 (2013) 022003

- R_t at 8 TeV (once ATLAS measurement is available)?

Possible combinations: angular distributions

Spin correlations (7 TeV)

- ATLAS: Phys. Rev. Lett. 108 (2012) 212001
 - first observation in dilepton channel (2.1/fb) using $\Delta\varphi$ in Lab
 - $A_{hel} = 0.40 \pm 0.04 \pm 0.08$ (SM NLO is 0.31)
- CMS: PAS TOP-12-004
 - similarly, using 5/fb $A_{hel} = 0.24 \pm 0.02 \pm 0.08$
 - also measure asymmetries $A_{\Delta\varphi}$ and $A_{\cos\vartheta\cos\vartheta}$ and with m_{tt} cut
 - finally unfolded to parton level and compared to generators

Charge asymmetry (7 TeV)

- ATLAS: Eur.Phys.J. C72 (2012) 2039 + ATLAS-CONF-2012-057
 - combined lepton+jets (1.04/fb) and dilepton (4.7/fb) channel
 - $A_C = 0.029 \pm 0.018 \pm 0.014$
- CMS: Phys.Lett.B 717 (2012) 129 + CMS PAS TOP-12-010
 - $A_C = 0.004 \pm 0.010 \pm 0.011$ (lepton+jets)
 - $A_C = 0.050 \pm 0.043^{+0.010}_{-0.037}$ (dilepton)
- Could combine also differential distributions (m_{tt} , etc.)

Possible combinations

Other ideas? What could be interesting?

- $t\bar{t}Z$?
- Search for FCNC in decay and production?
- ...

Next meetings

Closed with participation of experts

- track progress of ongoing combinations
- start new combinations
- b-tagging discussion (similar to jet/ E_T^{miss})
- generator uncertainties (single top, NLO vs multileg)

Open meetings

- so far:
 - *First meeting on 19-Jul-12, see this [URL](#)*
 - *Second meeting on 29-Nov-12, see this [URL](#)*
 - *This meeting 18-19-Apr-2013*
- shall agree on a date for this year
- probably after TOP2013 ~Oct/Nov