V+Jets summary and discussion MC@LHC 2011, Durham

Frank Siegert

Albert-Ludwigs-Universität Freiburg

Summary

Thanks for nice results from Tevatron and LHC!

- W/Z cross sections and W charge asymmetry   Uta Klein
- Diboson candidates/cross sections   Yanyan Gao
- V+jets at the Tevatron   Stefano Camarda
- V+jets in ATLAS   Ellie Dobson
- V+jets as signal and background in CMS Lukas Vanelderen
- V+jets as background in ATLAS   Monica D'Onofrio

→ Here: Focus on a few hot topics raised during the talks ...

W Charge Asymmetry

Shape difference between ATLAS and CMS?
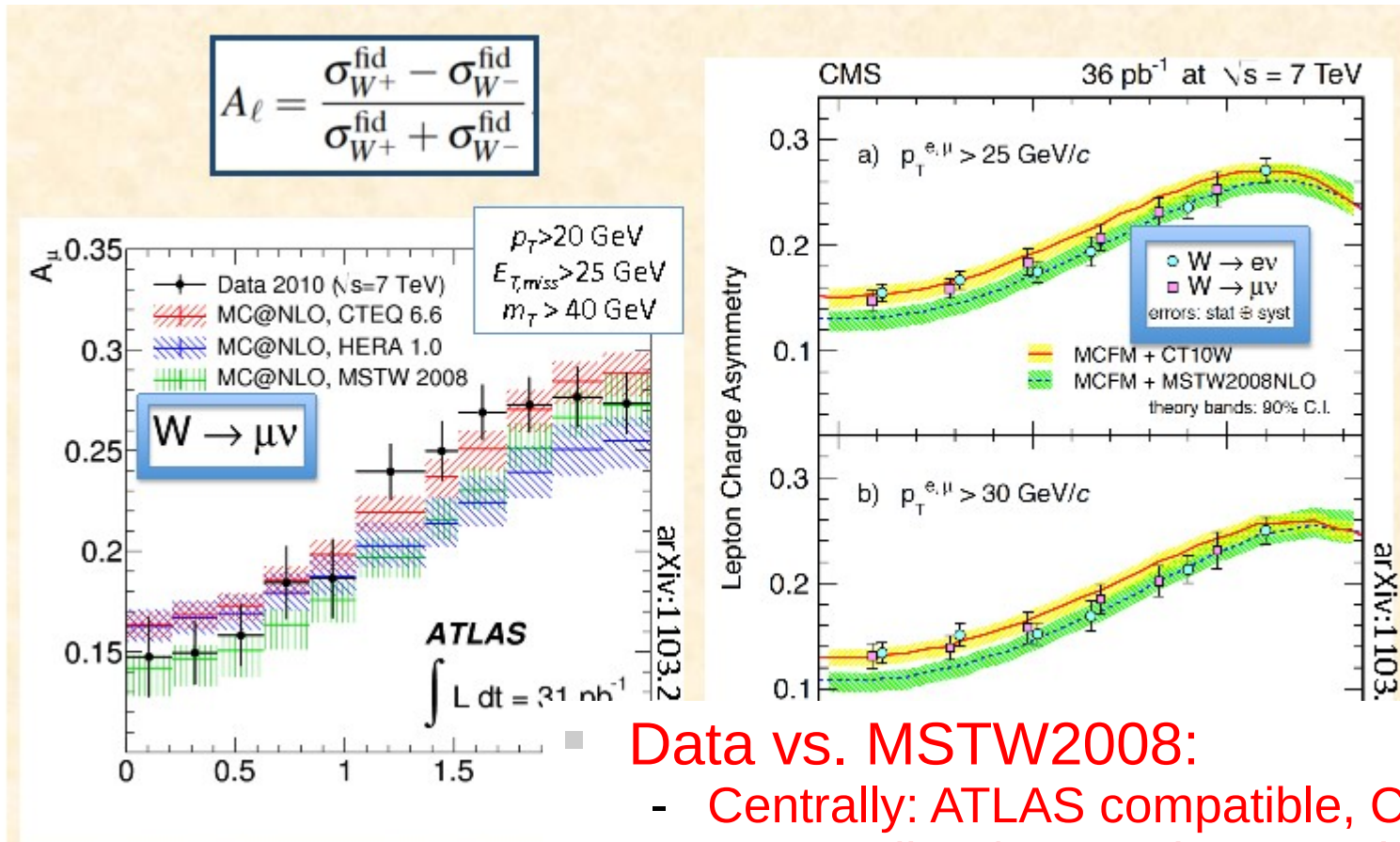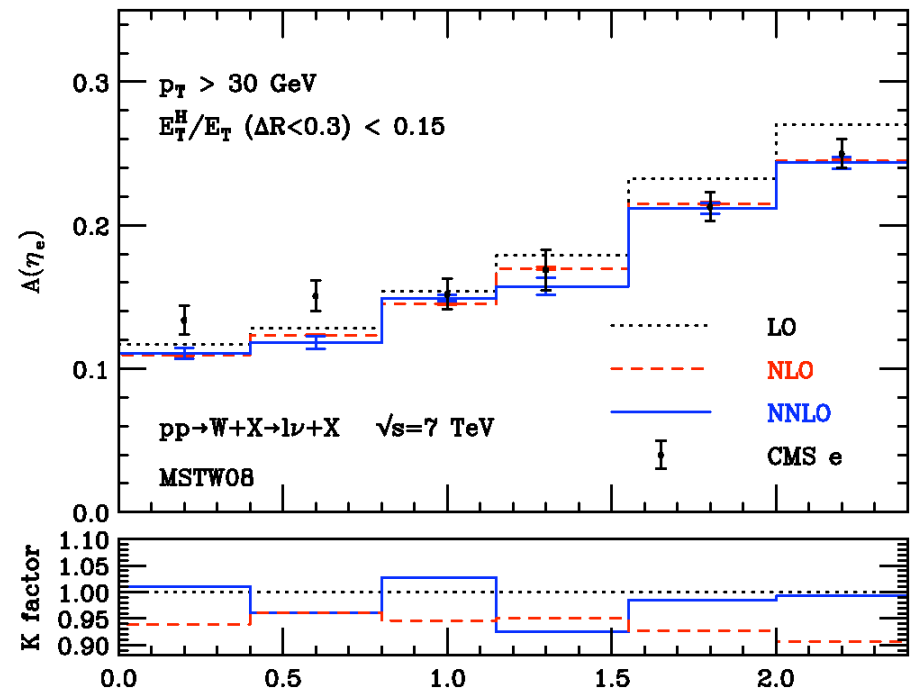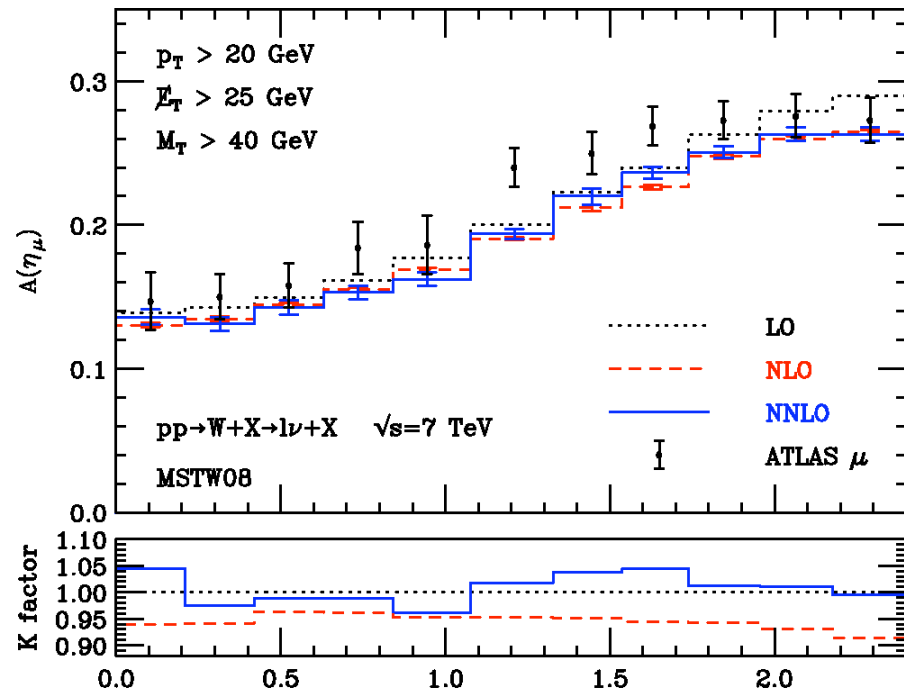

■ Data vs. MSTW2008:
- Centrally: ATLAS compatible, CMS higher
- Intermediate/Forward: ATLAS higher, CMS compatible

Could it be the different phase space?

- Lepton pT cut (20 vs. 25/30 GeV): No, cf. CMS variation

- E_Tmiss>25 GeV cut not present in CMS selection:

  - At LO this corresponds to lepton pT cut

  - N(N)LO corrections large enough? Cf. M. Grazzini:

Dibosons & „Data-driven" methods

- First (low-statistics) results for diboson production from ATLAS and CMS

  What about diphotons?

- Here and throughout the session: „Data-driven" methods to estimate/subtract backgrounds

- Clearer statements wanted: **How much Monte-Carlo is used in „data-driven"?**

  (Suggest good reference for the naive theorist to learn about the basics of those methods?)

- (Please: Name the source of background predictions in your plot legends!)

Di-jet mass in W + 2 jets

Still very active discussion about excess:
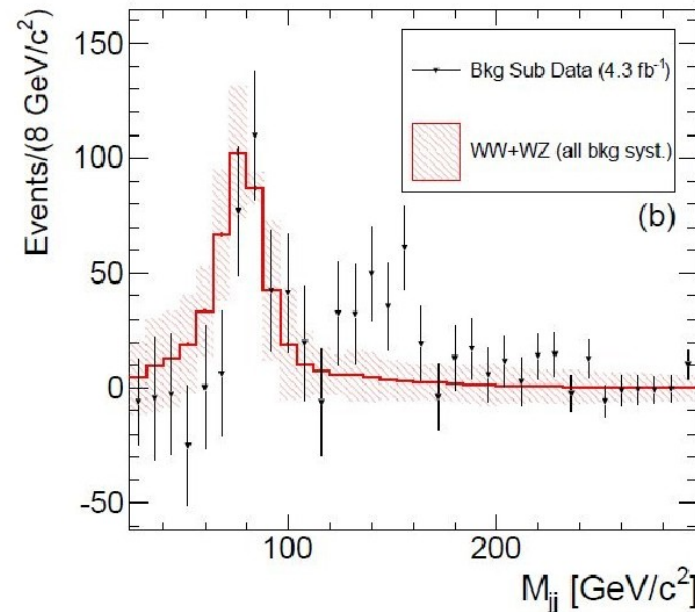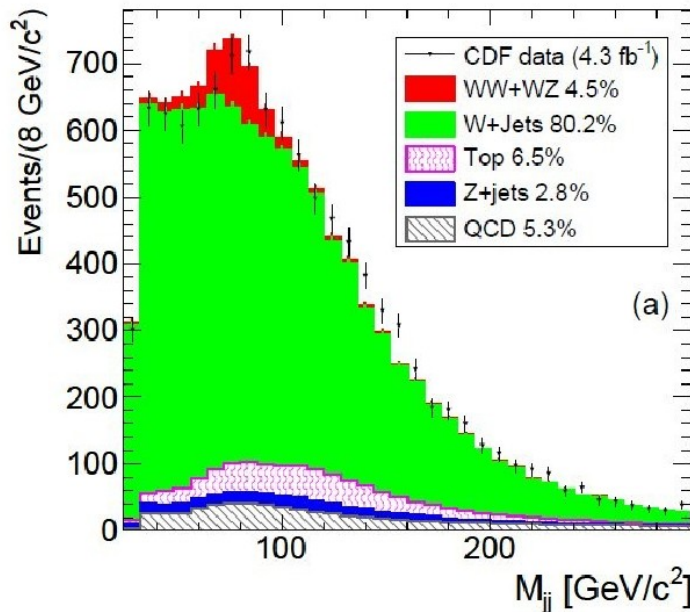
Disagreement is observed in 120-160 GeV/c² region

Stefano Camarda – SM@LHC 2011

→ Trying to divide questions into theoretical/experimental ...

Di-jet mass in W + 2 jets

- **Theoretical**

  - Quality of Alpgen predictions in CDF W + jets (midpoint cone)?

  - Unsafe JETCLU
    What about kT?
    (CDF: hep-ex/0701051)
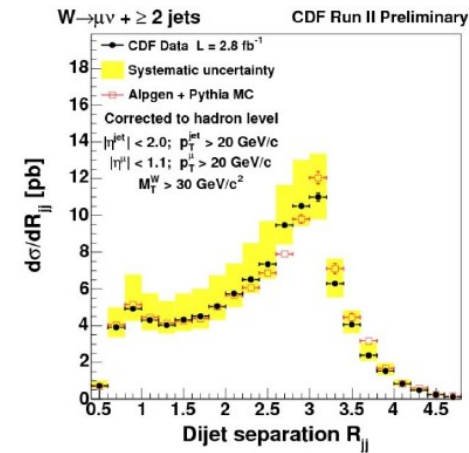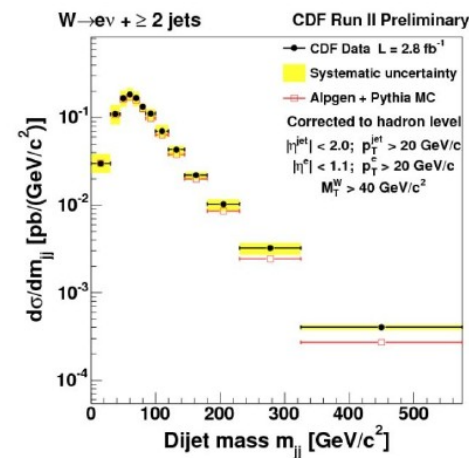
    + compare to genuine NLO

  - ttbar bkg with Pythia

- **Experimental**

  - JES? Monica: No, checked carefully

  - „Interesting" shape for 40<mjj<160 if W peak subtracted

  - More data / (public!) cross checks? ~ 1 month

  - What does D0 see? ~ few weeks

    → **Many issues not publically checked yet.**

We are all excited about the excess, please help us believe it!

Tuning uncertainties

- Monica: Large theoretical uncertainty on backgrounds, e.g. top production with ISR/FSR variation in MC

- **Uncertainty inflated** as constraints e.g. from LEP ignored!

- Better: Make use of tuning machinery:

  - All data taken into account

  - „Eigen"tunes with reasonable variation of parameters a la PDF eigenvectors → input from „Professor" team?