



CERN, February 10<sup>th</sup>, 2009

## DISCUSSION

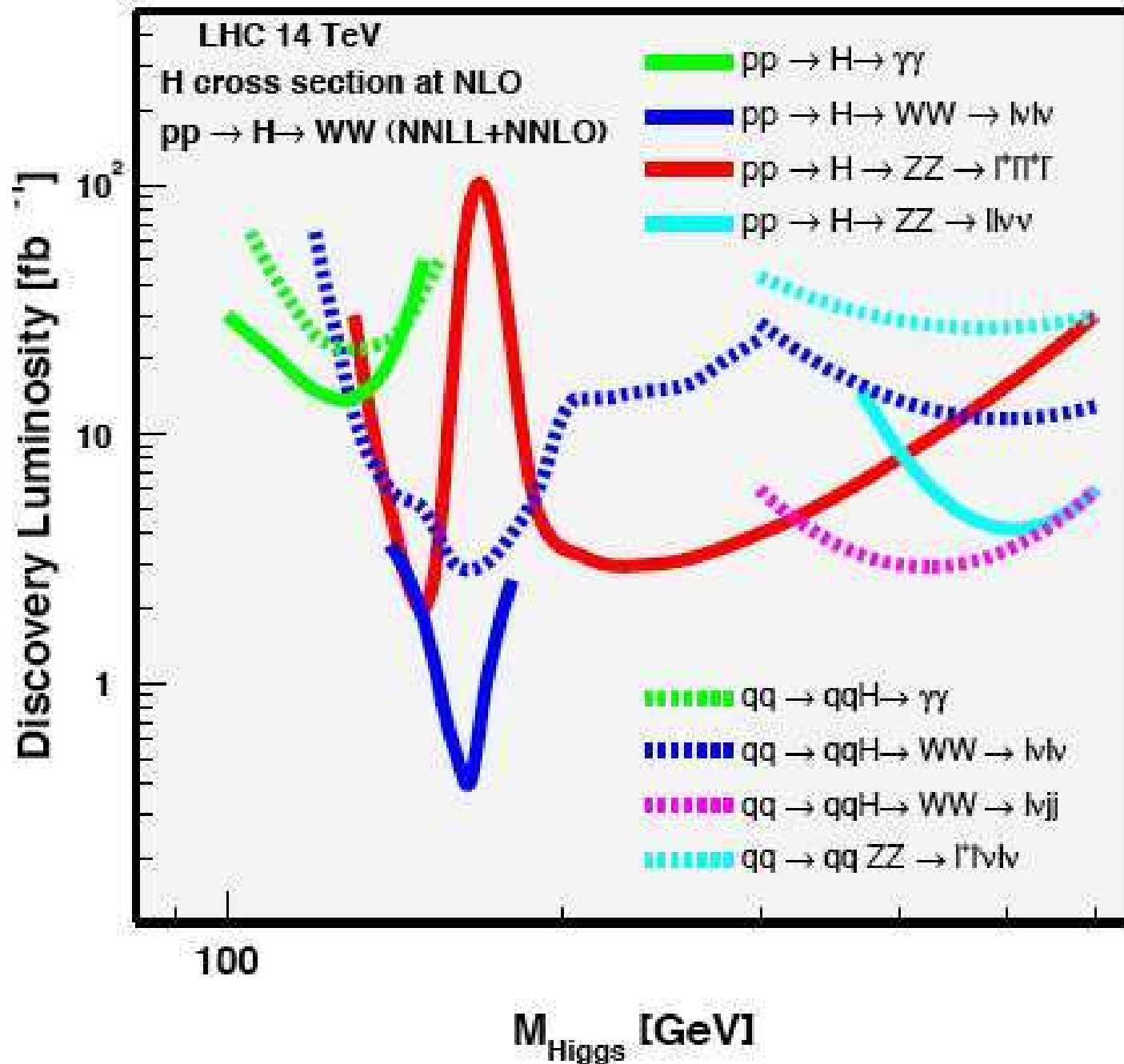
Premise: We find a SM-Like Higgs with

$$M_H = 130 \dots 180 \text{ GeV}, 5 \text{ fb}^{-1} \text{ (2011?)}$$

Question: Where do we go from here?

Herbi Dreiner (Bonn University)

# 5 $\sigma$ SM Higgs Signals (statistical errors only)



Plot based on “most optimistic results from ATLAS and CMS”

- In the given mass range can thus see

150 GeV – 180 GeV       $pp \rightarrow H \rightarrow WW \rightarrow \ell\nu\ell\nu$

150 GeV – 180 GeV       $pp \rightarrow qqH \rightarrow WW \rightarrow \ell\nu\ell\nu$

150 GeV – 160 GeV       $pp \rightarrow H \rightarrow ZZ \rightarrow \ell\ell\ell\ell$

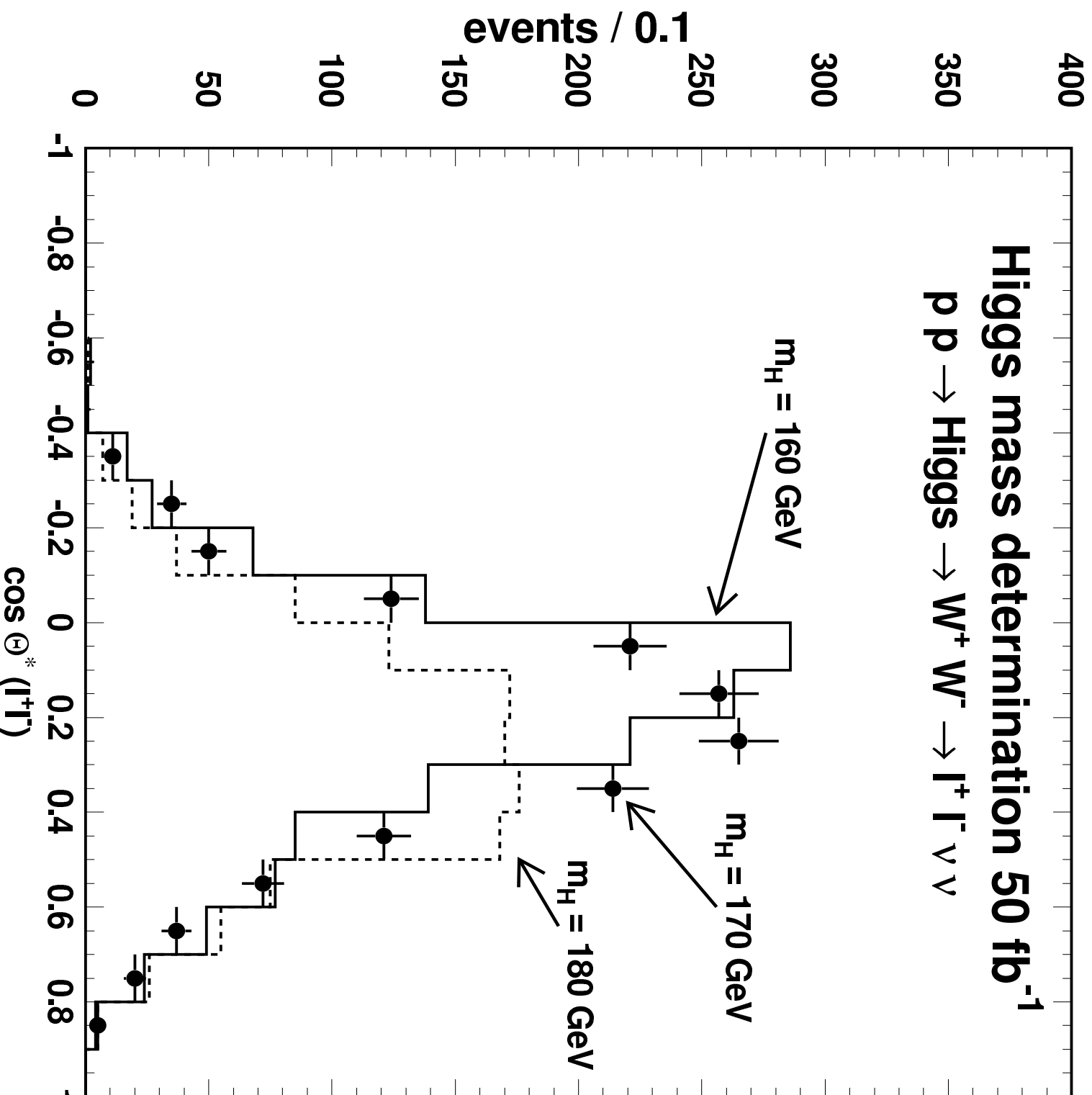
- How big are the systematic errors?
- Can they lead to major disruption of this?
- What can we learn if we compare all three measurements?

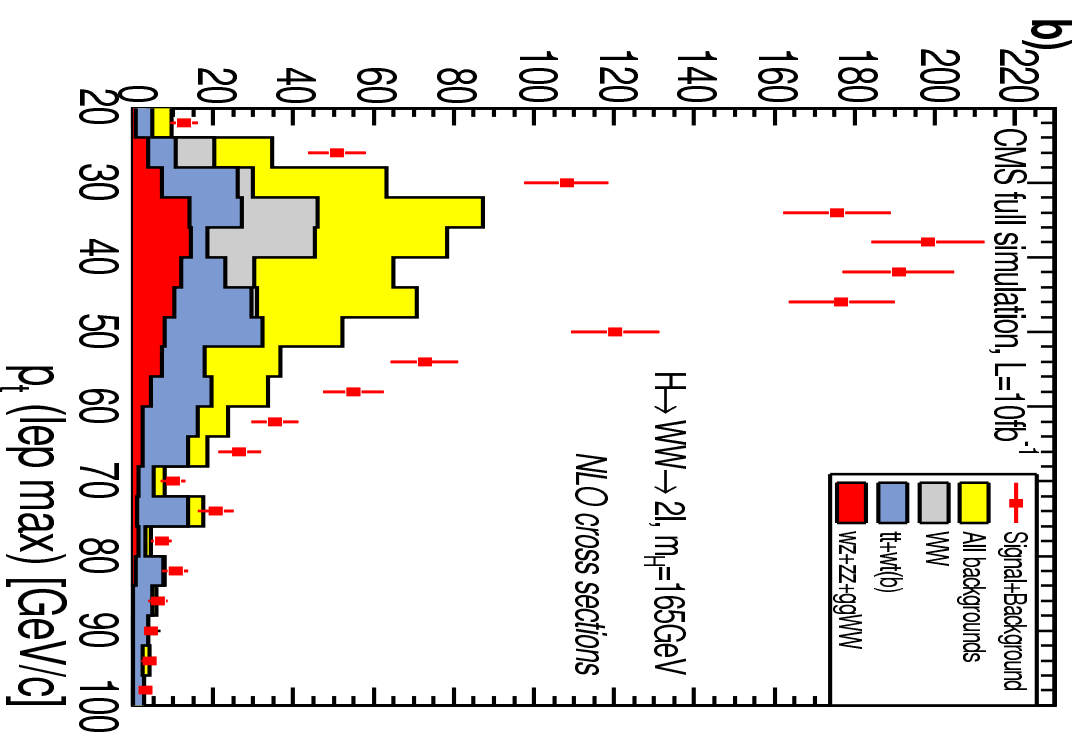
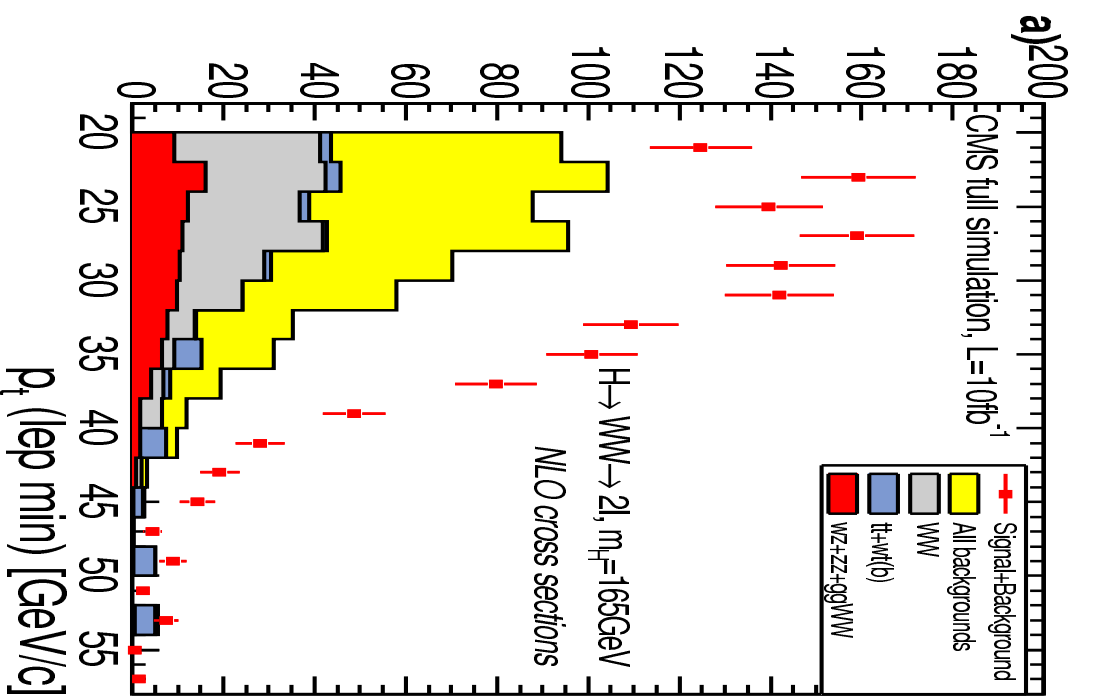
## Questions:

- How well do we know the background?
- How sure can we be that this is indeed the Higgs?
- What parameters can we determine?
- Can we determine the mass from  $H \rightarrow WW \rightarrow l\nu l\nu$ ?

# Higgs mass determination 50 fb<sup>-1</sup>

$p p \rightarrow \text{Higgs} \rightarrow W^+ W^- \rightarrow l^+ l^- \nu \nu$





source: CMS Note 2006/047, attention plots for  $10\text{fb}^{-1}$

