Addendum:

First Constraints on the Higgs boson mass
from the LHC

ATLAS and CMS searches in several channels
Results, as presented at the EPS conference in Grenoble on 22. July 2011
Tevatron experiments set a 95% CL exclusion of a SM Higgs boson in the mass region 158–173 GeV (first direct exclusion since LEP)

At $m_H = 115$ GeV

- Expected limit: $1.8 \times \sigma_{SM}$
- Observed limit: $2.7 \times \sigma_{SM}$
ATLAS and CMS searches in several channels:
ATLAS and CMS searches in several channels:

ATLAS

High mass region:

Figure 2: The invariant or transverse mass distributions for the candidate events selected, the total background and the signal expected in the $H \rightarrow WW \rightarrow \ell\nuqq$ (a) and $H \rightarrow ZZ \rightarrow \ell\ell\nu$ (b) channels and the $H \rightarrow ZZ \rightarrow \ell\ellqq$ tagged (c) and untagged (d) categories.
Limits on Higgs boson cross sections:

Limit in the H → WW channel in the mass region around 140-150 GeV worse than expected (Excess of events seen in ATLAS and CMS)
Combined limit (all channels) on Higgs boson cross sections:

Limit in the $H \rightarrow WW$ channel in the mass region around 140-150 GeV worse than expected (Excess of events seen in ATLAS and CMS)

Excluded mass regions: 155 – 190 GeV and 295 - 450 GeV

expected (no signal): 136 – 196 GeV and 327 – 443 GeV
Combined limit (all channels) on Higgs boson cross sections:

- Limit in the $H \rightarrow WW$ channel in the mass region around 140-150 GeV worse than expected (Excess of events seen in ATLAS and CMS)

- Excluded mass regions: 149 – 206 GeV  
  expected (no signal): 127 – 420 GeV
Combined limit (all channels) in the low mass region:

Limit in the $H \rightarrow WW$ channel in the mass region around 140-150 GeV worse than expected (Excess of events seen in ATLAS and CMS)

Excess in mass region 120 – 140 GeV: $\sim 2.8\sigma$
Excluded mass regions: 155 – 190 GeV  
expected (no signal): 136 – 196 GeV
Consistency of the observed results with the background-only hypothesis is shown in the low mass range. The dashed line shows the median expected significance in the hypothesis of a signal. The two horizontal dashed lines indicate the p-values corresponding to significances of 2$\sigma$ and 3$\sigma$. The integral of the observed signal is $1.0 - 1.2 \text{ fb}^{-1}$ at $\sqrt{s} = 7 \text{ TeV}$. The observed data is compared with the expected signal, and the consistency with the background-only hypothesis is assessed within this mass range.
CMS exclusion plot in the $H \rightarrow WW$ channel:

Limit in the $H \rightarrow WW$ channel in the mass region around 140-150 GeV worse than expected (Comparable excess of events as seen in ATLAS)

Excluded mass regions: 150 – 193 GeV