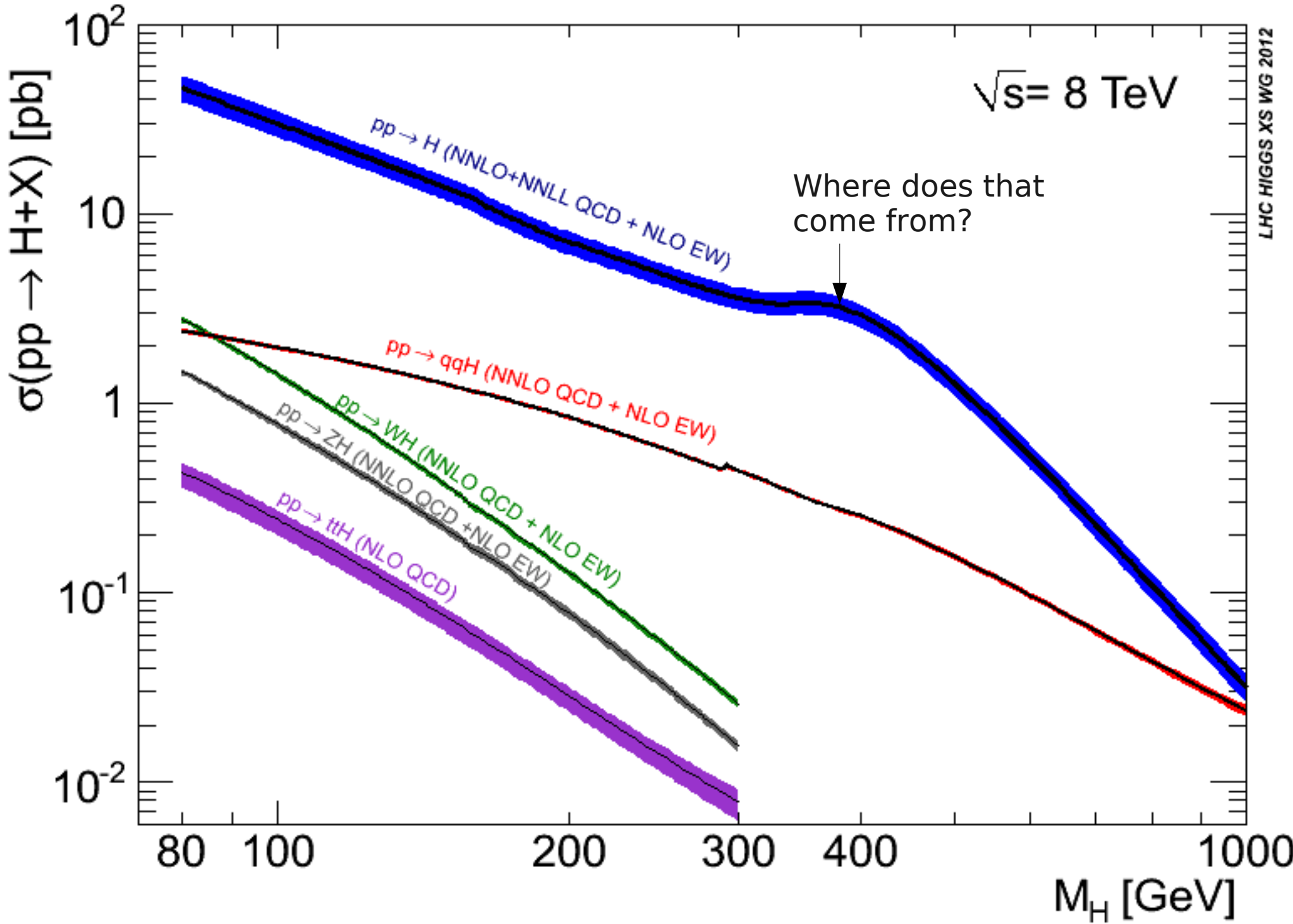


6.1.2 Higgs mechanism in the Standard Model

6.1.3 Experimental Higgs searches

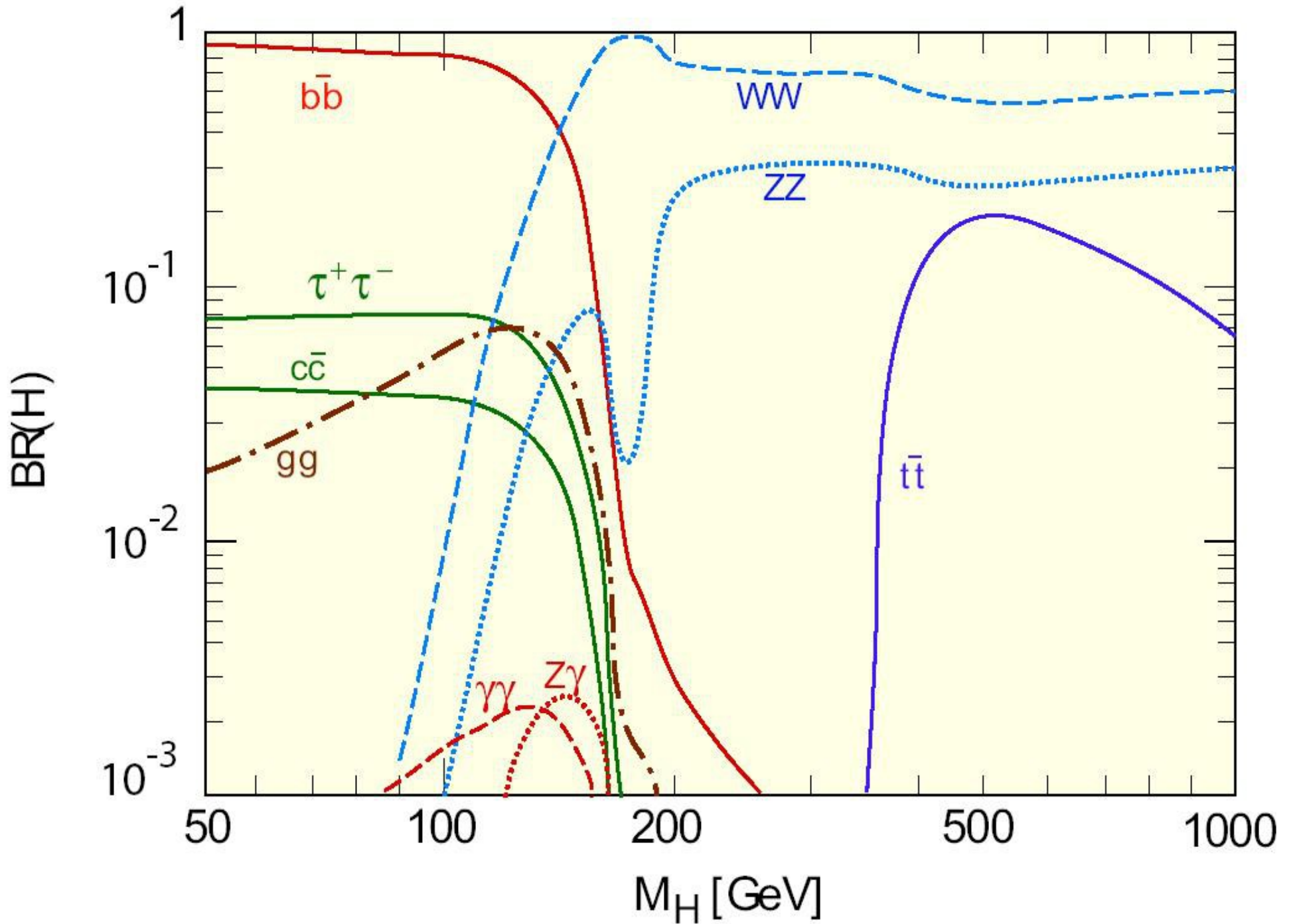
6.1.3 Experimental Higgs searches

6.1.3 Experimental Higgs searches

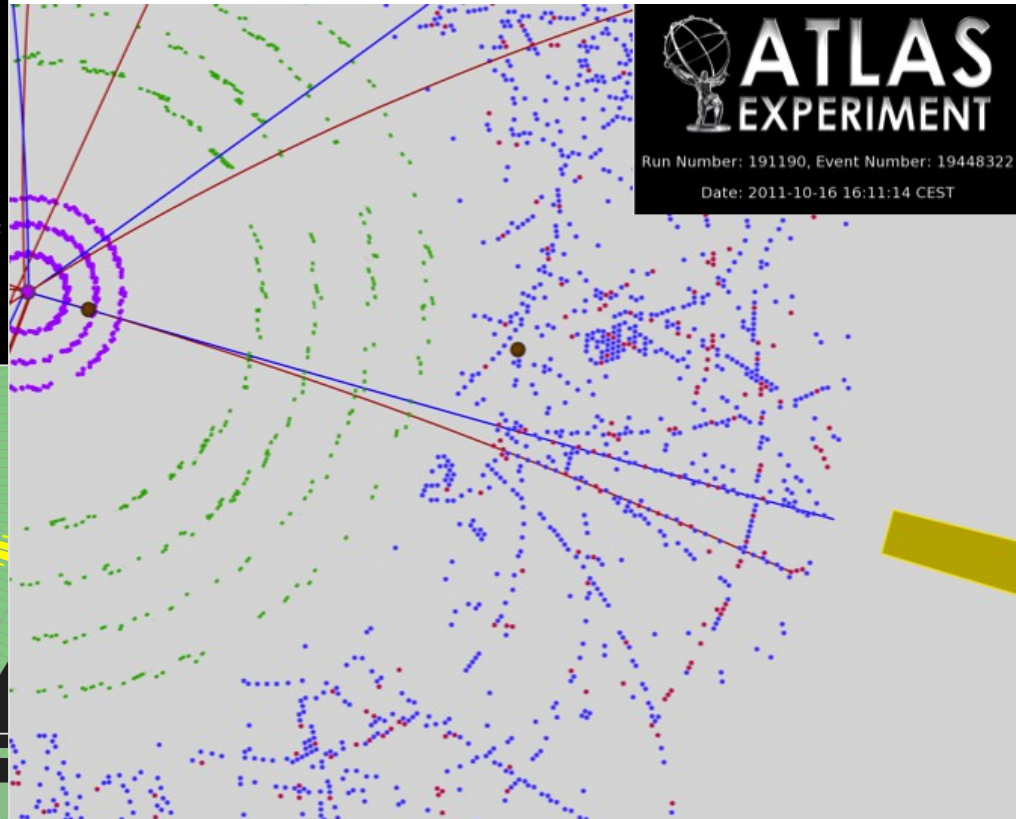
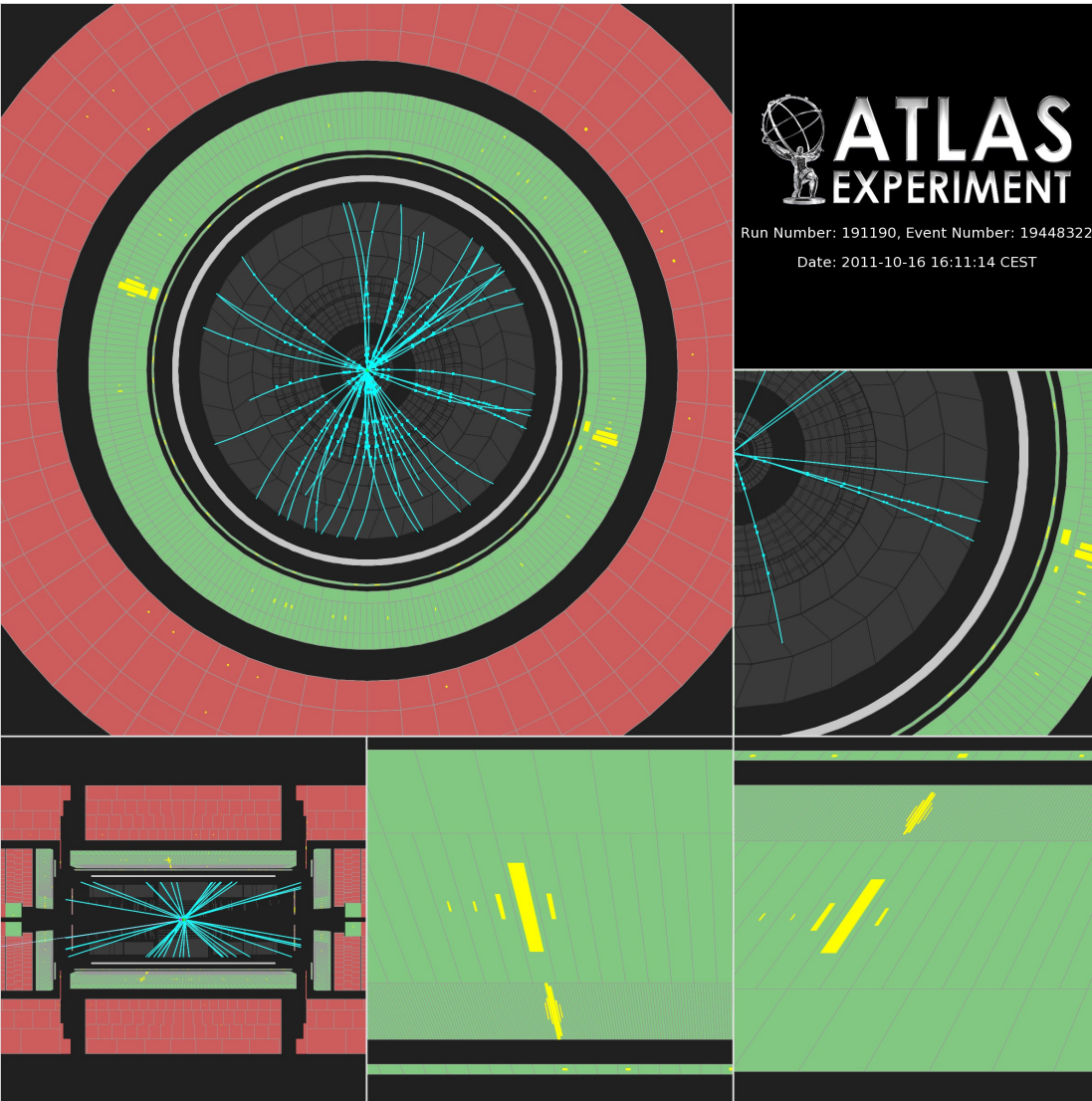


6.1.3 Experimental Higgs searches

Higgs Branching-Fractions vs. Higgs Mass



Measurement of $H \rightarrow \gamma\gamma$

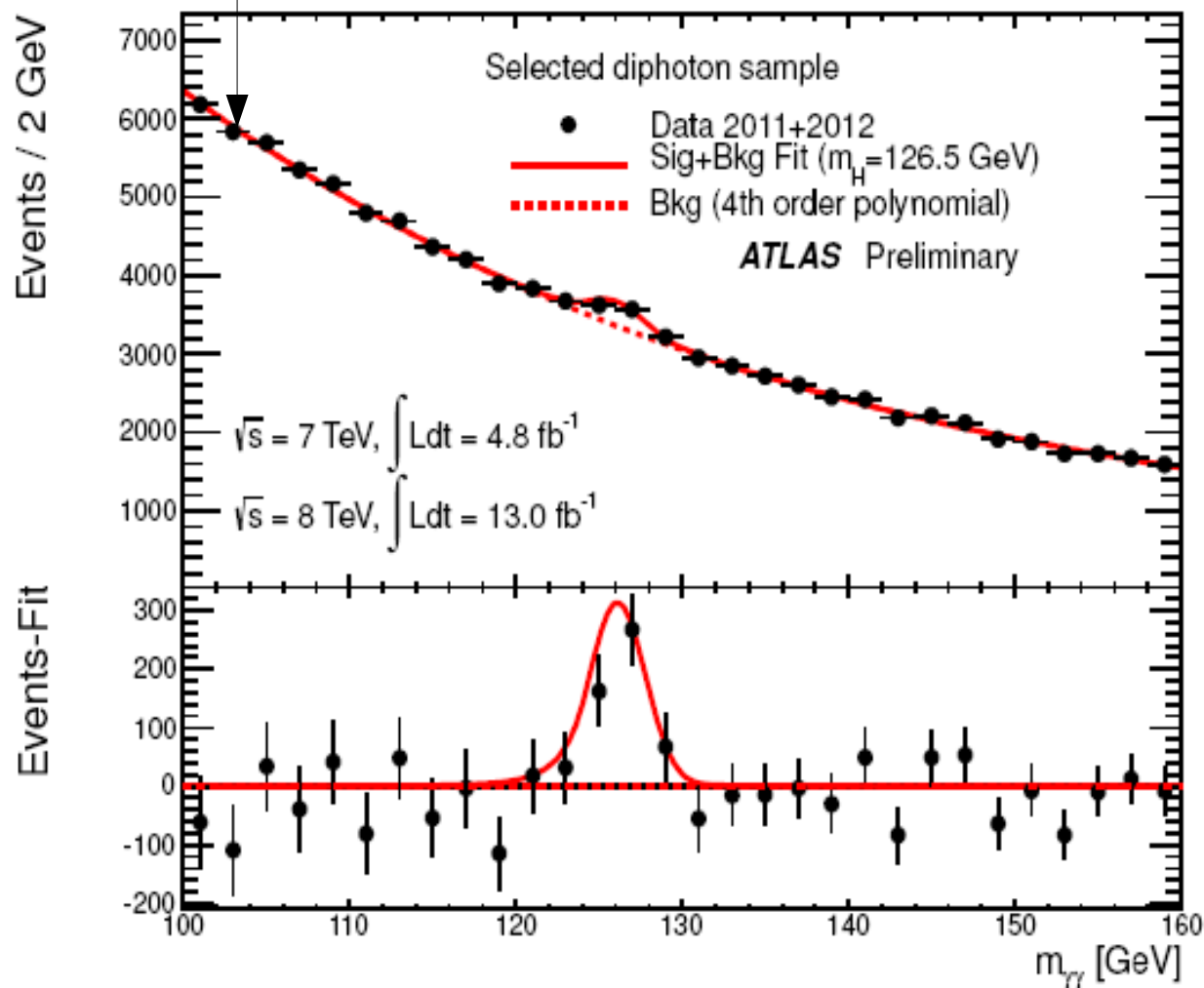
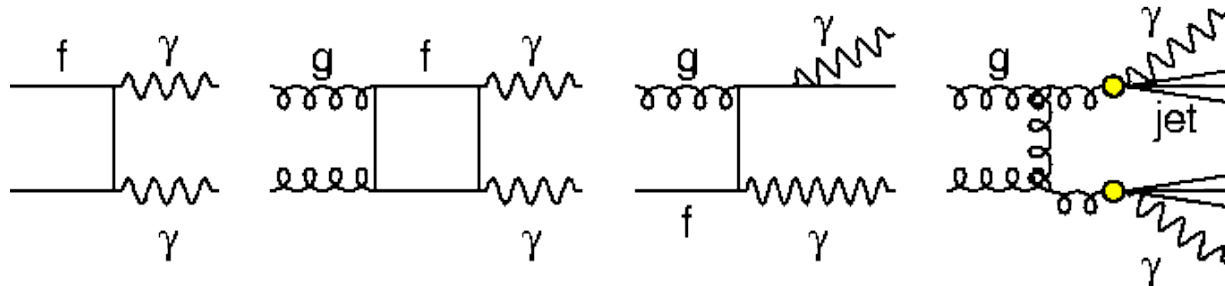


**Material in front of Calorimeter: $O(1.5 X_0)$
=> Sizable probability that a photon
converts into e^+e^- inside the detector**

$$I(x) = I_0 e^{-\frac{7x}{9X_0}}$$

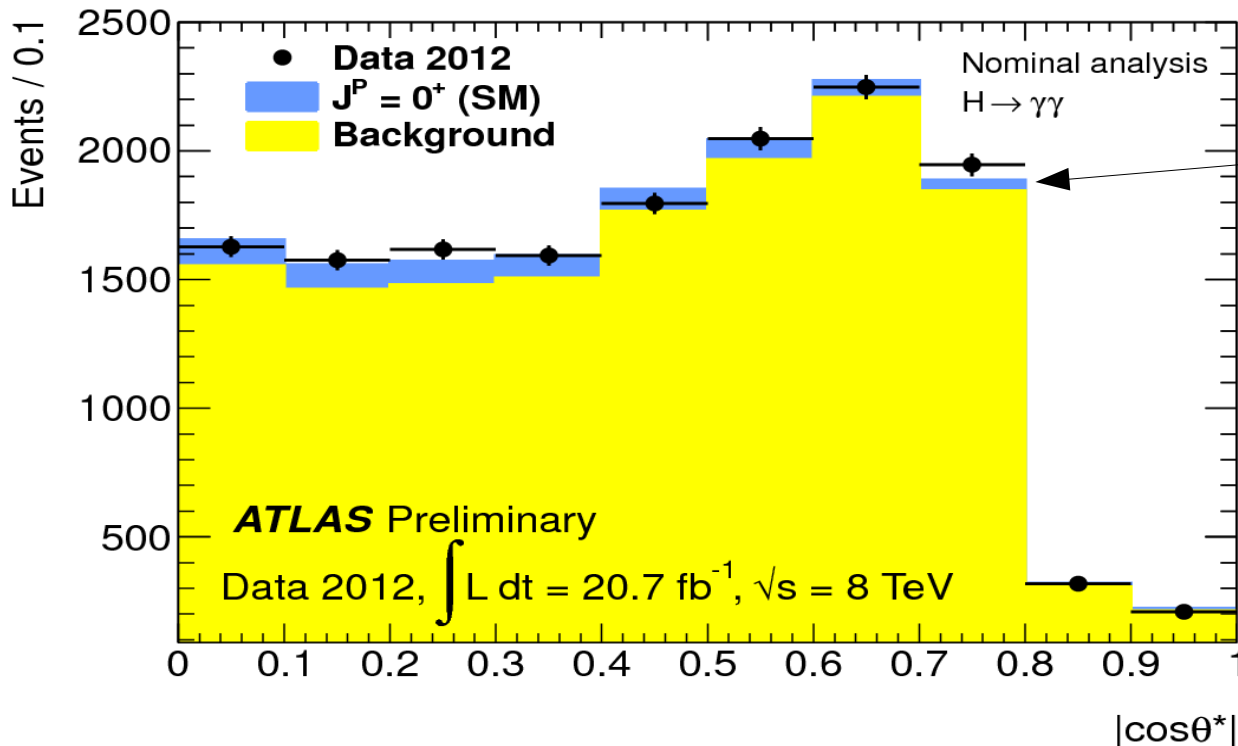
Measurement of $H \rightarrow \gamma\gamma$

Irreducible Background (after suppression of jets and π^0) obtained from fit

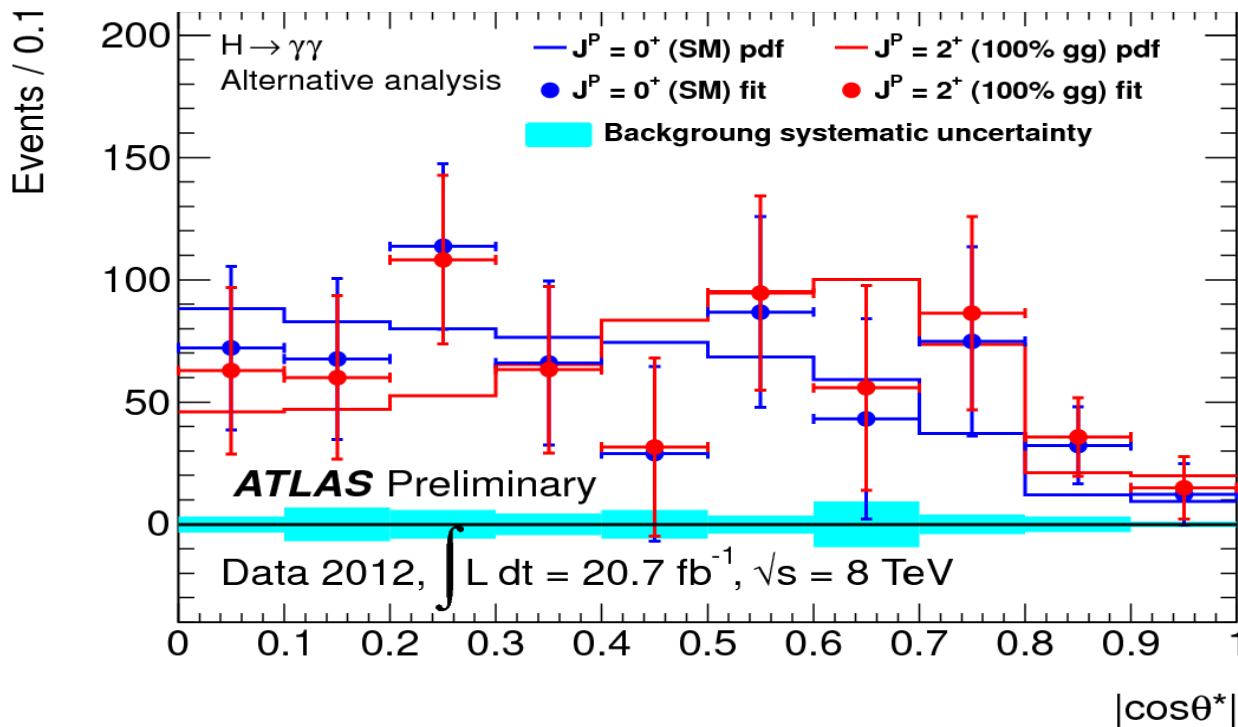


**Calorimeter resolution
crucial to see the signal
over the large BG**

Measurement of $H \rightarrow \gamma\gamma$



Signal and BG obtained from a bin-wise fit to $m_{\gamma\gamma}$ spectrum

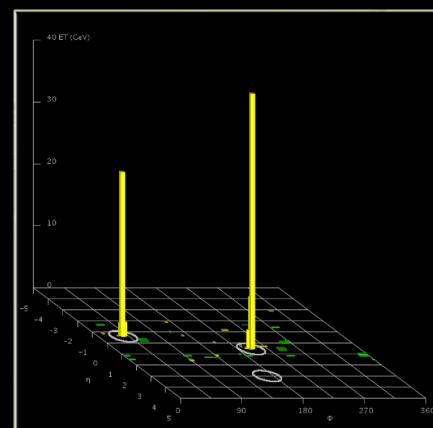
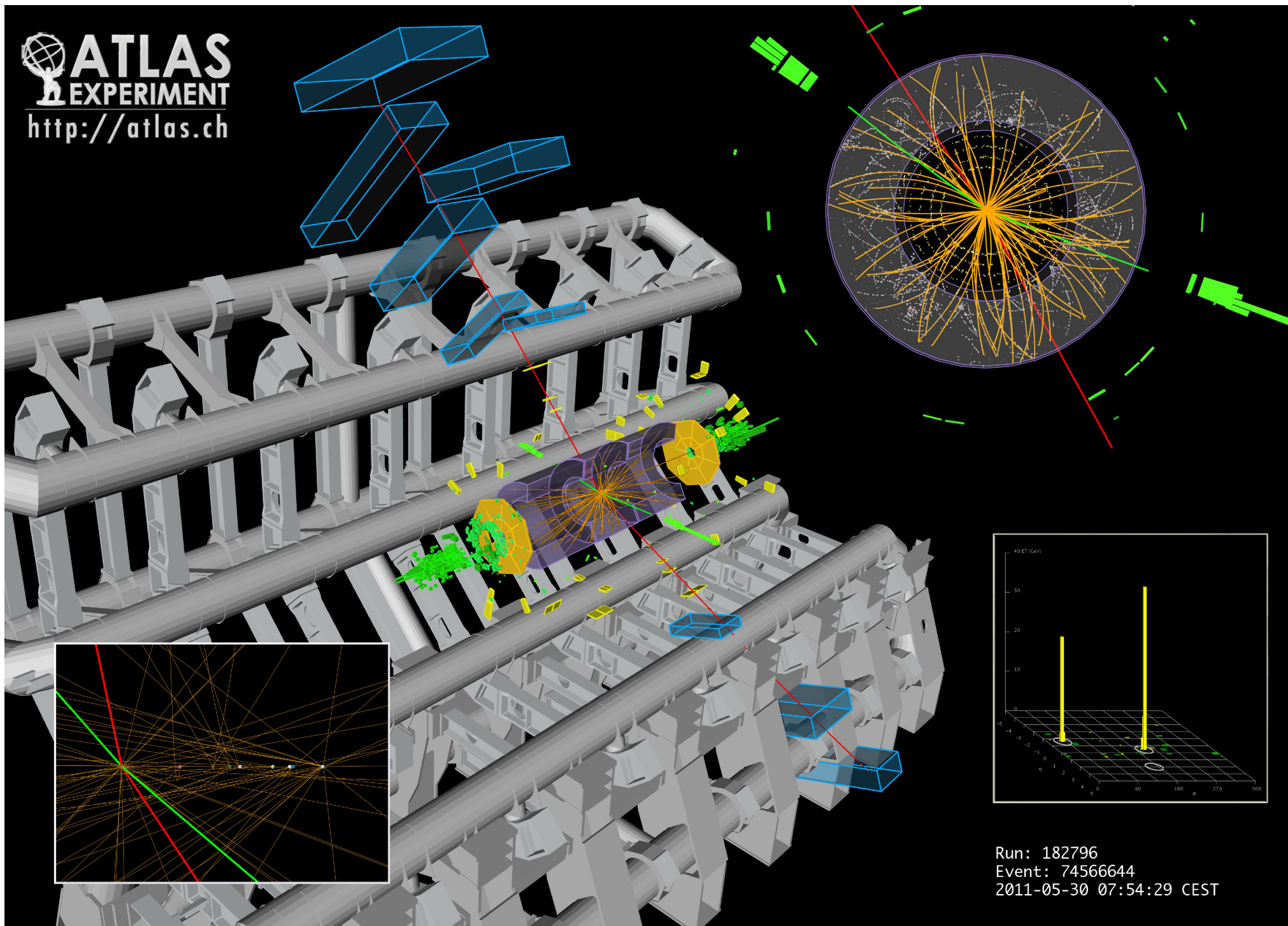


Landau–Yang theorem:
Spin-1 \rightarrow 2 on-shell photons
forbidden

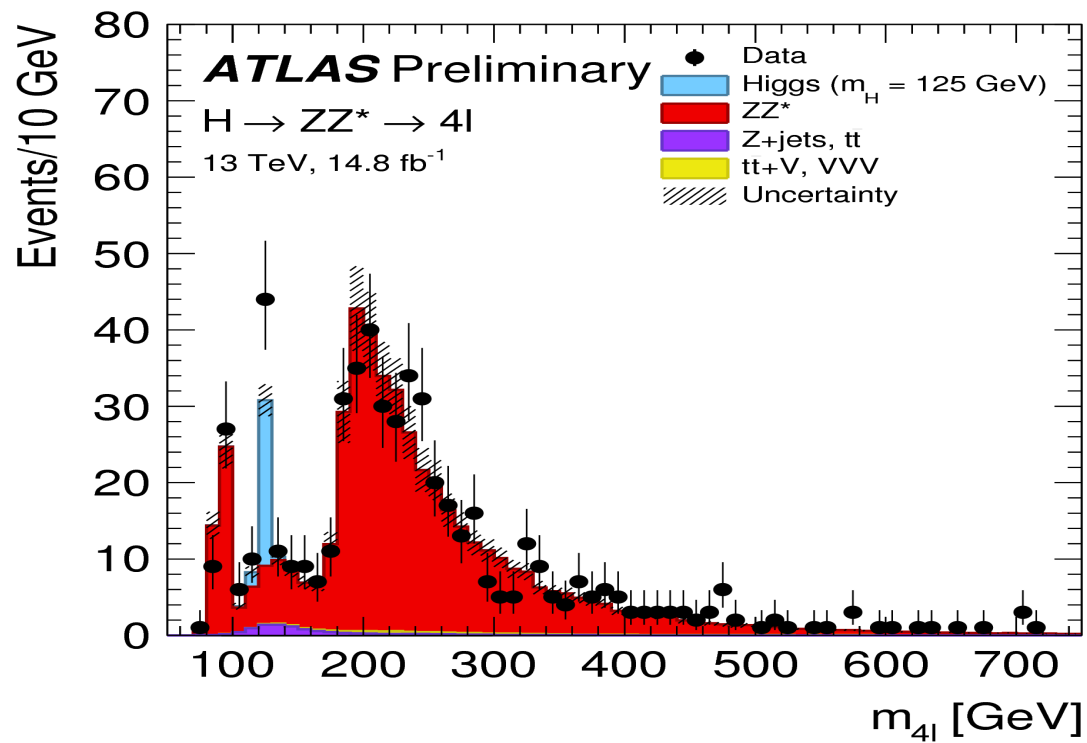
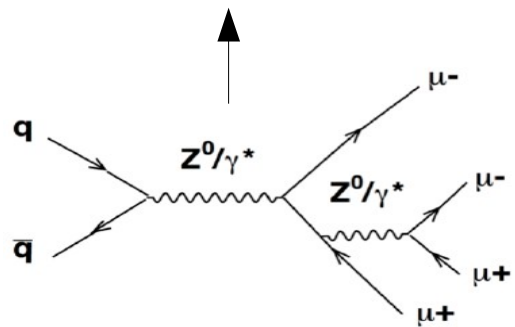
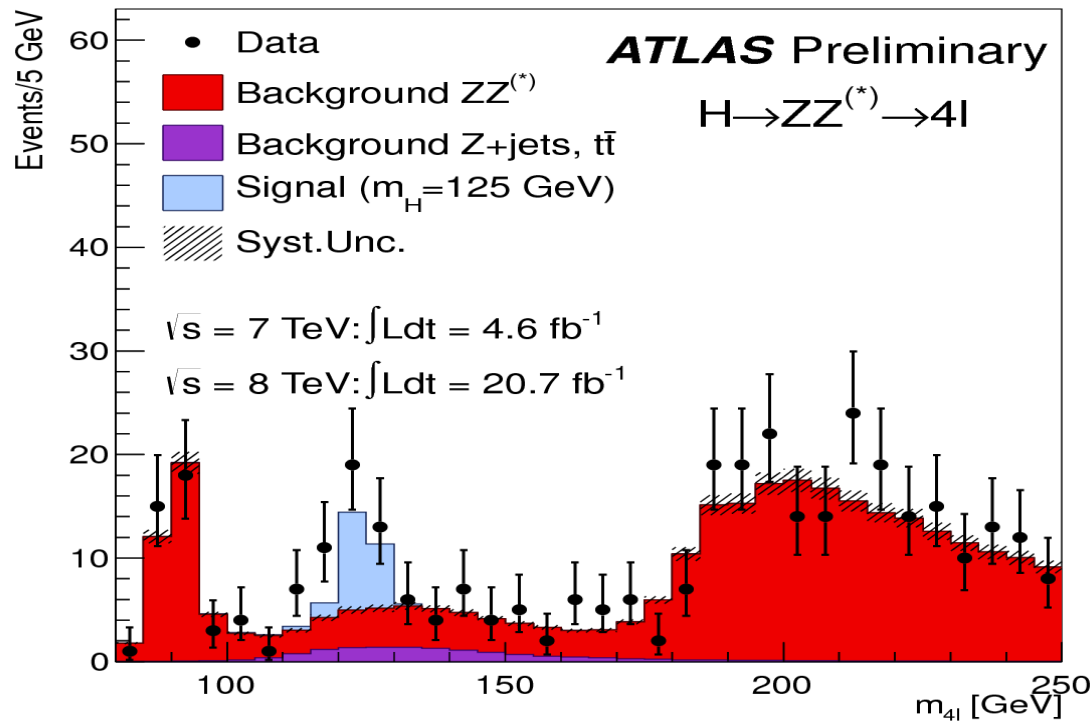
2^+ hypothesis excluded
with 99% confidence

Measurement of $H \rightarrow ZZ^* \rightarrow 4l$

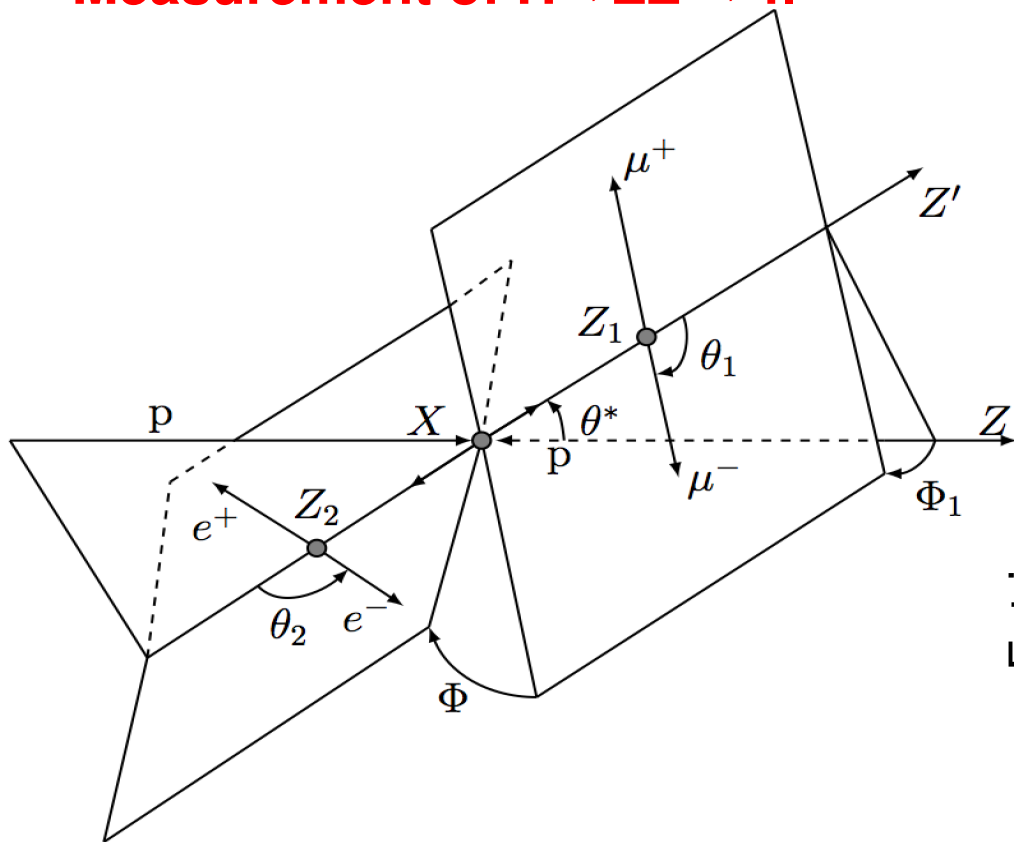
ATLAS
EXPERIMENT
<http://atlas.ch>



Measurement of $H \rightarrow ZZ^* \rightarrow 4l$



Measurement of $H \rightarrow ZZ^* \rightarrow 4l$



0^- hypothesis excluded
with 97.8% confidence
(some admixture can
not be excluded)

