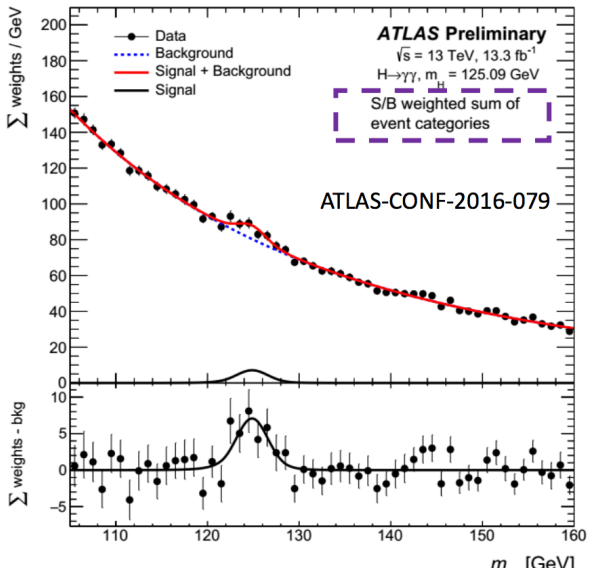
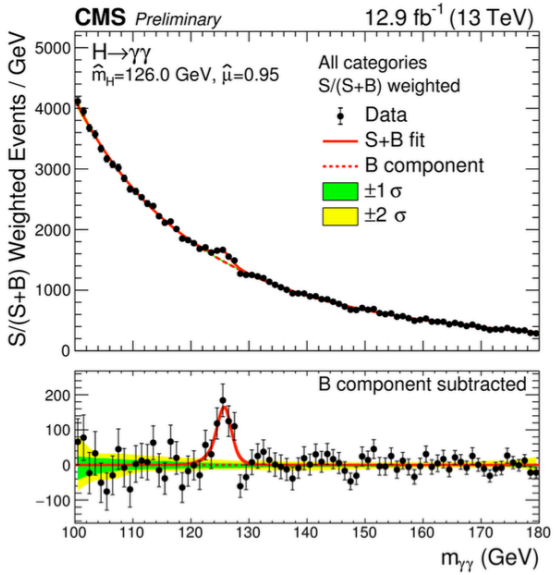
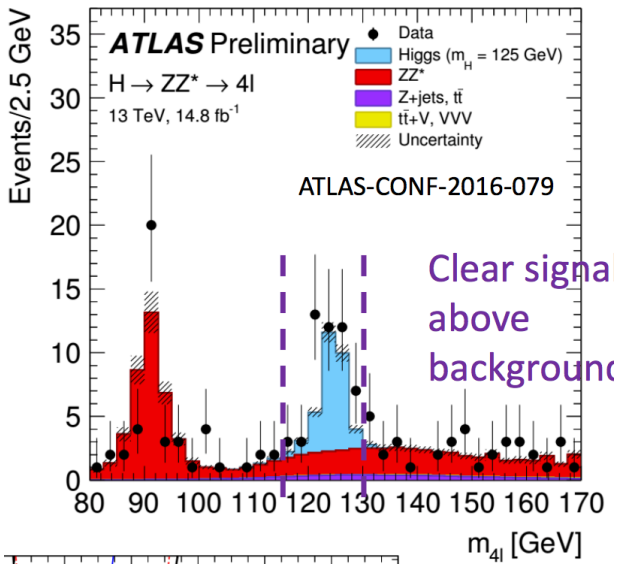
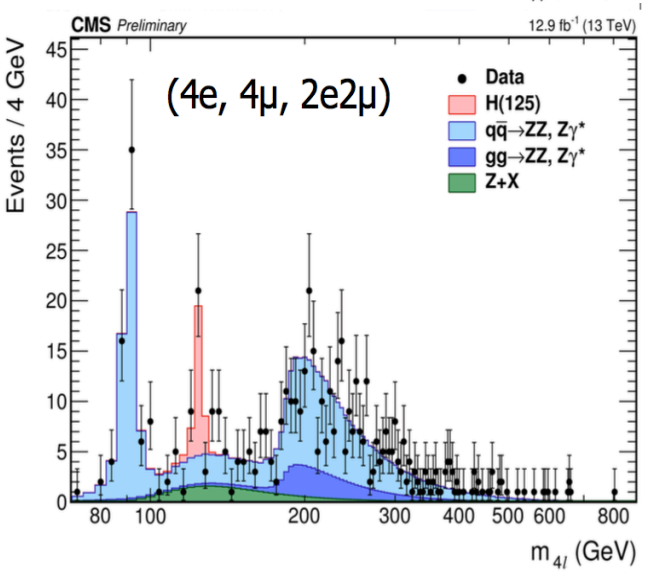
# H→dibosons: 1) re-discovery at 13TeV



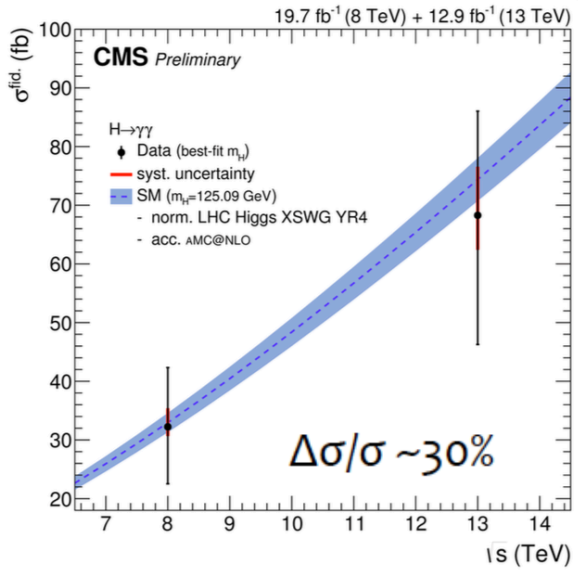



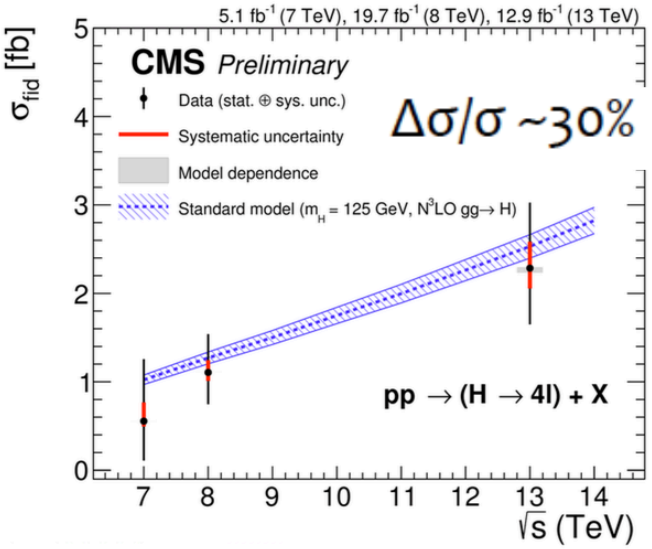




**Not exactly the same excitement as in 2012 but still very nice to see again our old friend.**

# 2) Fiducial and differential cross sections CMS



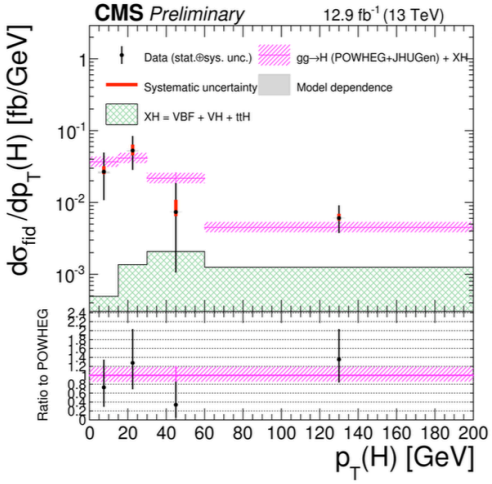

- Fiducial cross section measured profiling $m_H$

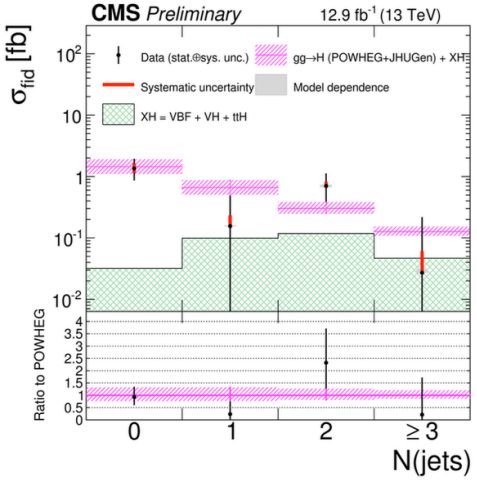
$$\hat{\sigma}_{fid} = 69^{+18}_{-22}\,\text{fb} = 69^{+16}_{-22}(\text{stat.})^{+8}_{-6}(\text{syst.})\,\text{fb}$$

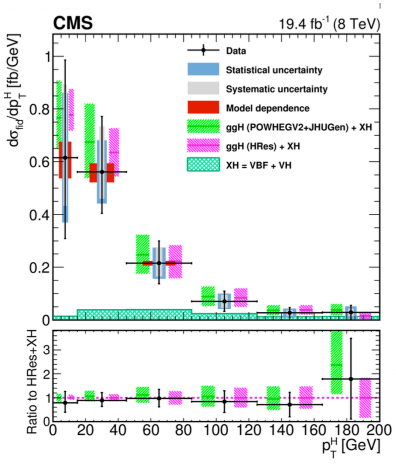
- Theoretical prediction for $m_H$=125.09 GeV

$$\hat{\sigma}_{fid} = 73.8 \pm 3.8\ \text{fb}$$

**Individual cross sections (H→γγ and H→ 4l)**



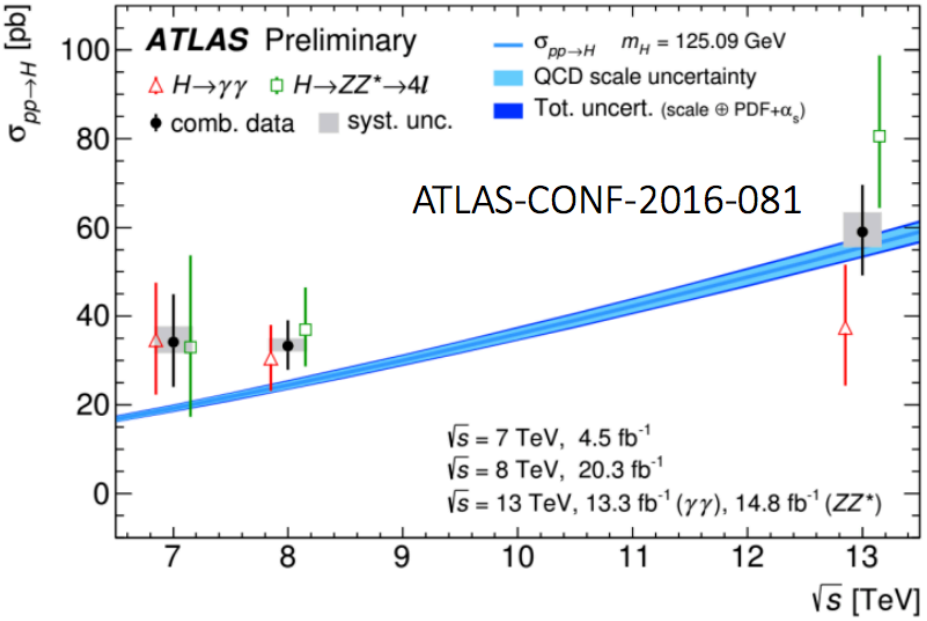




$$\sigma_{\text{fid.}} = 2.29^{+0.74}_{-0.64}(\text{stat.})^{+0.30}_{-0.23}(\text{sys.})^{+0.01}_{-0.05}(\text{model dep.})\ \text{fb}$$

SM prediction: $\sigma^{\text{SM}}_{\text{fid.}} = 2.53 \pm 0.13\ \text{fb}$

**Differential cross sections (H→ 4l 13TeV; H→WW 8TeV)**

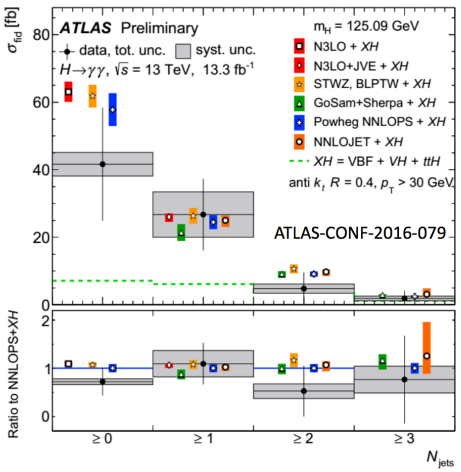
# 2) Fiducial and differential cross sections ATLAS

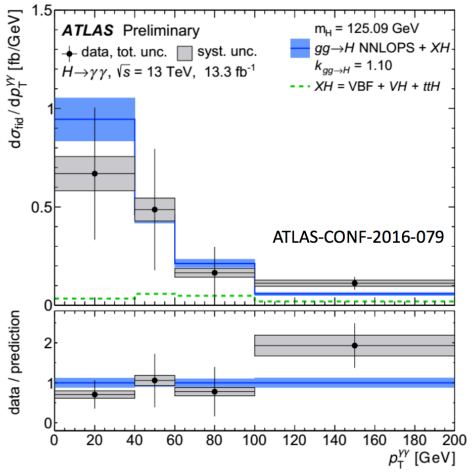


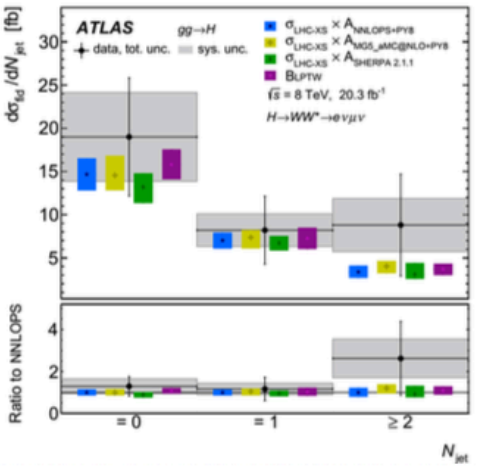

**Individual and combined cross section H→γγ and H→ 4l**

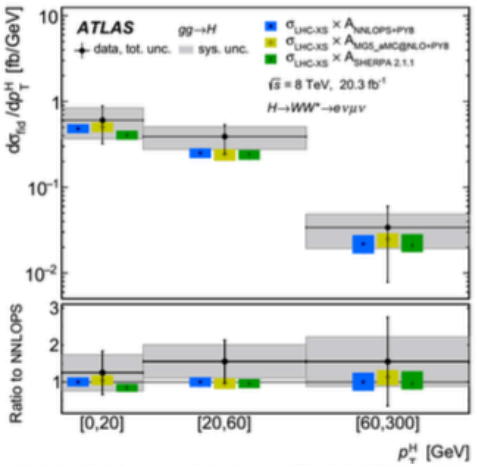
**Differential cross sections (H→γγ 13TeV+ H→WW 8TeV)**

❑ Differential measurement



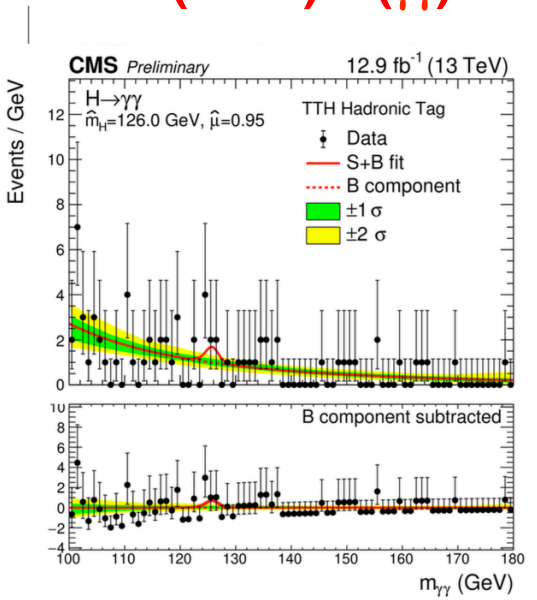



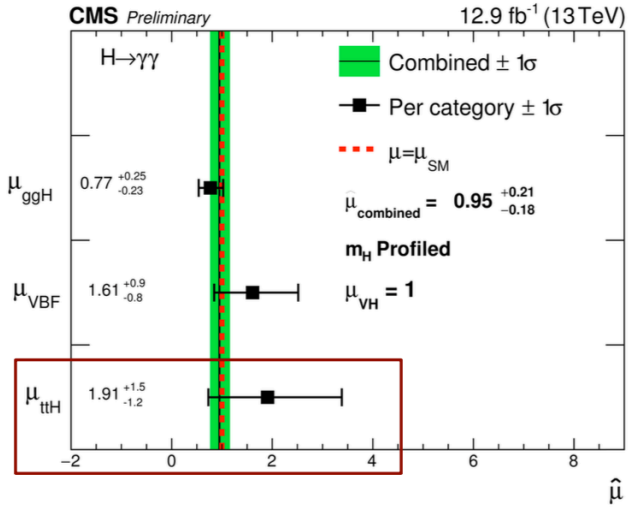
# 3) The next challenge: ttH

Extremely challenging production mechanism.
Very important to establish the direct Yukawa coupling of the Higgs to the heaviest quark (only indirectly tested via loops ggH, Hγγ).

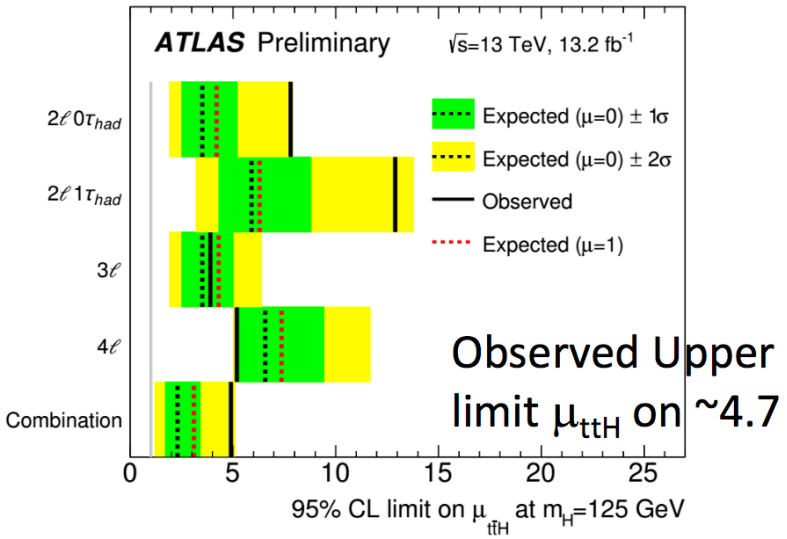
**tt(hadr) H(γγ)**




**μ = 1.9 $^{+1.5}_{-1.2}$ (2016 dataset)**




**ttH (multileptons)**




**To be watched carefully with the full available statistics.**