

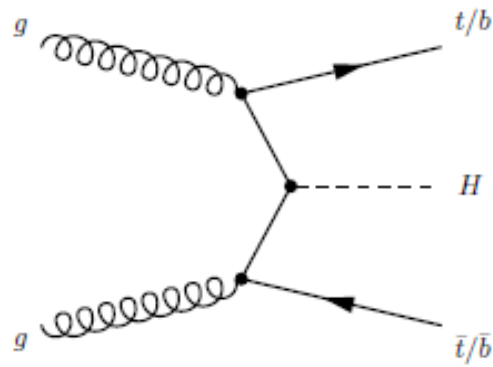
Summary and (unofficial) combinations

- Decay to fermions: $\tau\tau$, bb

	ATLAS μ	ATLAS σ	CMS μ	CMS σ	Comb μ	Comb σ
tautau	1.41 ± 0.40	4.5 (3.4)	0.78 ± 0.27	3.2 (3.7)	0.98 ± 0.22	5.5 (5.0)
VH(bb)	0.51 ± 0.40	1.4 (2.6)	0.89 ± 0.45	2.1 (2.5)	0.68 ± 0.30	2.5 (3.6)
	VH + ttH		VH + ttH + VBF			
LHC All bb	0.63 ± 0.38	1.8 (2.8)	1.0 ± 0.4	2.6 (2.7)	0.81 ± 0.28	3.2 (3.9) +TeVatron 3.9

- Higgs $\rightarrow \tau\tau$ (unofficially) discovered! *CP structure of coupling?*
- bb still large uncertainties \Rightarrow confirm, constrain

- **ttH**



	ttHgg	ttHbb	ttH(leptons)	Combined
ATLAS	$1.3^{+2.6}_{-1.8}$	1.5 ± 1.1	$2.1^{+1.4}_{-1.2}$	1.8 ± 0.8
CMS	$2.7^{+2.6}_{-1.8}$	$1.2^{+1.6}_{-1.5}$	4l: $-4.7^{+5}_{-1.3}$ 3l: $3.1^{+2.4}_{-2.0}$ 2lSS: $5.3^{+2.1}_{-1.8}$	$2.8^{+1.0}_{-0.9}$
Combined				$2.2 \pm ? [0.6-1.1]$

- **Direct coupling of Higgs to top still to be confirmed**
- **Light excess? ATLAS-CMS combination to come soon...**
- **13 TeV/8 TeV cross-section increase: x 4**
 - **background prediction: ttW, ttZ, ttbb ?**

- sign of top coupling ?

- Direct (from tH) :

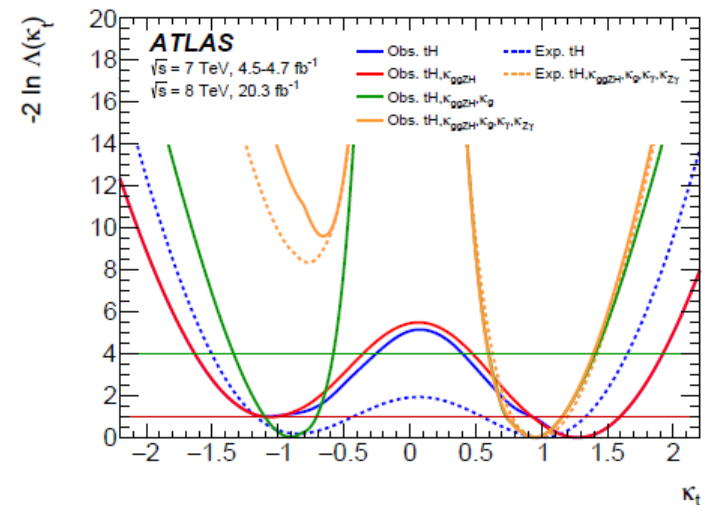
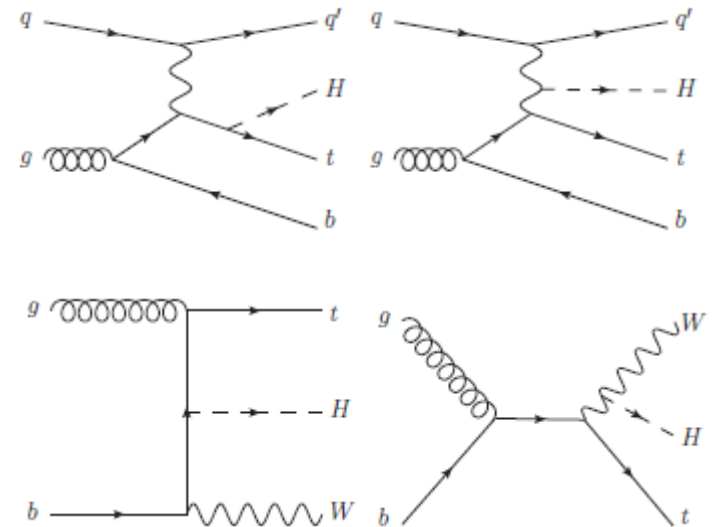
for $k_t = -1$

- CMS : $\mu < 7.6$ (bb) ; 4.1 ($\gamma\gamma$) ; 6.7 (leptons)
 $\Rightarrow \mu < \sim 5$

- Indirect

- ATLAS: $k_t = -1$ excluded at 4 sigmas.
 (mostly from $H\gamma\gamma$)

- Is this still an issue?



- **Lepton flavour violation decay?**

- ATLAS $B(H \rightarrow \mu\tau) = (0.77 \pm 0.62)\%$. $B(H \rightarrow \mu\tau) < 1.85\%$ at 95% CL
 - CMS $B(H \rightarrow \mu\tau) = (0.84^{+0.39}_{-0.37})\%$. $B(H \rightarrow \mu\tau) < 1.51\%$ “ ”
- $H \rightarrow e\tau$ results to come soon...

Higgs difermion decays look quite SM like...

- **Run II:**

- **ttH** : investigate the present (moderate) excess
ttW, ttZ, ttbb predictions?
- **bb** : more precision => ensure discovery, *total width*
- $\mu\mu$: *discovery* (3σ : $> 300 \text{ fb}^{-1}$)
- $\tau\tau$: *spin analysis in the decay ??* ($> 1000 \text{ fb}^{-1}$)