H^0

$J = 0$

In the following H^0 refers to the signal that has been discovered in the Higgs searches. Whereas the observed signal is labeled as a spin 0 particle and is called a Higgs Boson, the detailed properties of H^0 and its role in the context of electroweak symmetry breaking need to be further clarified. These issues are addressed by the measurements listed below.

Concerning mass limits and cross section limits that have been obtained in the searches for neutral and charged Higgs bosons, see the sections "Searches for Neutral Higgs Bosons" and "Searches for Charged Higgs Bosons ($H^{\pm}$ and $H^{\pm\pm}$)", respectively.

H^0 MASS

VALUE (GeV)		*DOCUMENT ID*		*TECN*	*COMMENT*
125.09±0.21±0.11	[1,2]	AAD	15B	LHC	pp, 7, 8 TeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
125.07±0.25±0.14	[2]	AAD	15B	LHC	pp, 7, 8 TeV, $\gamma\gamma$
125.15±0.37±0.15	[2]	AAD	15B	LHC	pp, 7, 8 TeV, $ZZ^* \rightarrow 4\ell$
126.02±0.43±0.27		AAD	15B	ATLS	pp, 7, 8 TeV, $\gamma\gamma$
124.51±0.52±0.04		AAD	15B	ATLS	pp, 7, 8 TeV, $ZZ^* \rightarrow 4\ell$
125.59±0.42±0.17		AAD	15B	CMS	pp, 7, 8 TeV, $ZZ^* \rightarrow 4\ell$
$125.02^{+0.26}_{-0.27}{}^{+0.14}_{-0.15}$	[3]	KHACHATRY...	15AM	CMS	pp, 7, 8 TeV
125.36±0.37±0.18	[1,4]	AAD	14W	ATLS	pp, 7, 8 TeV
125.98±0.42±0.28	[4]	AAD	14W	ATLS	pp, 7, 8 TeV, $\gamma\gamma$
124.51±0.52±0.06	[4]	AAD	14W	ATLS	pp, 7, 8 TeV, $ZZ^* \rightarrow 4\ell$
125.6 ±0.4 ±0.2	[5]	CHATRCHYAN	14AA	CMS	pp, 7, 8 TeV, $ZZ^* \rightarrow 4\ell$
122 ±7	[6]	CHATRCHYAN	14K	CMS	pp, 7, 8 TeV, $\tau\tau$
124.70±0.31±0.15	[7]	KHACHATRY...	14P	CMS	pp, 7, 8 TeV, $\gamma\gamma$
$125.5 \pm 0.2 {}^{+0.5}_{-0.6}$	[1,8]	AAD	13AK	ATLS	pp, 7, 8 TeV
126.8 ±0.2 ±0.7	[8]	AAD	13AK	ATLS	pp, 7, 8 TeV, $\gamma\gamma$
$124.3 {}^{+0.6}_{-0.5}{}^{+0.5}_{-0.3}$	[8]	AAD	13AK	ATLS	pp, 7, 8 TeV, $ZZ^* \rightarrow 4\ell$
125.8 ±0.4 ±0.4	[1,9]	CHATRCHYAN	13J	CMS	pp, 7, 8 TeV
126.2 ±0.6 ±0.2	[9]	CHATRCHYAN	13J	CMS	pp, 7, 8 TeV, $ZZ^* \rightarrow 4\ell$
126.0 ±0.4 ±0.4	[1,10]	AAD	12AI	ATLS	pp, 7, 8 TeV
125.3 ±0.4 ±0.5	[1,11]	CHATRCHYAN	12N	CMS	pp, 7, 8 TeV

[1] Combined value from $\gamma\gamma$ and $ZZ^* \rightarrow 4\ell$ final states.

[2] ATLAS and CMS data are fitted simultaneously.

[3] KHACHATRYAN 15AM use up to 5.1 fb^{-1} of pp collisions at E_{cm} = 7 TeV and up to 19.7 fb^{-1} at E_{cm} = 8 TeV.

[4] AAD 14W use 4.5 fb^{-1} of pp collisions at E_{cm} = 7 TeV and 20.3 fb^{-1} at 8 TeV.

[5] CHATRCHYAN 14AA use 5.1 fb^{-1} of pp collisions at E_{cm} = 7 TeV and 19.7 fb^{-1} at E_{cm} = 8 TeV.

[6] CHATRCHYAN 14K use 4.9 fb^{-1} of pp collisions at E_{cm} = 7 TeV and 19.7 fb^{-1} at E_{cm} = 8 TeV.
[7] KHACHATRYAN 14P use 5.1 fb^{-1} of pp collisions at E_{cm} = 7 TeV and 19.7 fb^{-1} at E_{cm} = 8 TeV.
[8] AAD 13AK use 4.7 fb^{-1} of pp collisions at E_{cm}=7 TeV and 20.7 fb^{-1} at E_{cm}=8 TeV. Superseded by AAD 14W.
[9] CHATRCHYAN 13J use 5.1 fb^{-1} of pp collisions at E_{cm} = 7 TeV and 12.2 fb^{-1} at E_{cm} = 8 TeV.
[10] AAD 12AI obtain results based on 4.6–4.8 fb^{-1} of pp collisions at E_{cm} = 7 TeV and 5.8–5.9 fb^{-1} at E_{cm} = 8 TeV. An excess of events over background with a local significance of 5.9 σ is observed at m_{H^0} = 126 GeV. See also AAD 12DA.
[11] CHATRCHYAN 12N obtain results based on 4.9–5.1 fb^{-1} of pp collisions at E_{cm} = 7 TeV and 5.1–5.3 fb^{-1} at E_{cm} = 8 TeV. An excess of events over background with a local significance of 5.0 σ is observed at about m_{H^0} = 125 GeV. See also CHATRCHYAN 12BY and CHATRCHYAN 13Y.

H^0 SPIN AND *CP* PROPERTIES

The observation of the signal in the $\gamma\gamma$ final state rules out the possibility that the discovered particle has spin 1, as a consequence of the Landau-Yang theorem. This argument relies on the assumptions that the decaying particle is an on-shell resonance and that the decay products are indeed two photons rather than two pairs of boosted photons, which each could in principle be misidentified as a single photon.

Concerning distinguishing the spin 0 hypothesis from a spin 2 hypothesis, some care has to be taken in modelling the latter in order to ensure that the discriminating power is actually based on the spin properties rather than on unphysical behavior that may affect the model of the spin 2 state.

Under the assumption that the observed signal consists of a single state rather than an overlap of more than one resonance, it is sufficient to discriminate between distinct hypotheses in the spin analyses. On the other hand, the determination of the *CP* properties is in general much more difficult since in principle the observed state could consist of any admixture of *CP*-even and *CP*-odd components. As a first step, the compatibility of the data with distinct hypotheses of pure *CP*-even and pure *CP*-odd states with different spin assignments has been investigated. In order to treat the case of a possible mixing of different *CP* states, certain cross section ratios are considered. Those cross section ratios need to be distinguished from the amount of mixing between a *CP*-even and a *CP*-odd state, as the cross section ratios depend in addition also on the coupling strengths of the *CP*-even and *CP*-odd components to the involved particles. A small relative coupling implies a small sensitivity of the corresponding cross section ratio to effects of *CP* mixing.

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
	[1] AAD	16	ATLS	$H^0 \to \gamma\gamma$
	[2] AAD	16BL	ATLS	$pp \to H^0 jjX$ (VBF), $H^0 \to \tau\tau$, 8 TeV
	[3] KHACHATRY...	16AB	CMS	$pp \to WH^0$, ZH^0, $H^0 \to b\overline{b}$, 8 TeV
	[4] AAD	15AX	ATLS	$H^0 \to WW^*$
	[5] AAD	15CI	ATLS	$H^0 \to ZZ^*$, WW^*, $\gamma\gamma$
	[6] AALTONEN	15	TEVA	$p\overline{p} \to WH^0$, ZH^0, $H^0 \to b\overline{b}$
	[7] AALTONEN	15B	CDF	$p\overline{p} \to WH^0$, ZH^0, $H^0 \to b\overline{b}$

[8] KHACHATRY...	15Y	CMS	$H^0 \rightarrow 4\ell$, WW^*, $\gamma\gamma$
[9] ABAZOV	14F	D0	$p\overline{p} \rightarrow WH^0$, ZH^0, $H^0 \rightarrow b\overline{b}$
[10] CHATRCHYAN	14AA	CMS	$H^0 \rightarrow ZZ^*$
[11] CHATRCHYAN	14G	CMS	$H^0 \rightarrow WW^*$
[12] KHACHATRY...	14P	CMS	$H^0 \rightarrow \gamma\gamma$
[13] AAD	13AJ	ATLS	$H^0 \rightarrow \gamma\gamma$, $ZZ^* \rightarrow 4\ell$, $WW^* \rightarrow \ell\nu\ell\nu$
[14] CHATRCHYAN	13J	CMS	$H^0 \rightarrow ZZ^* \rightarrow 4\ell$

[1] AAD 16 study $H^0 \rightarrow \gamma\gamma$ with an effective Lagrangian including CP even and odd terms in 20.3 fb^{-1} of pp collisions at $E_{\rm cm}$ = 8 TeV. The data is consistent with the expectations for the Higgs boson of the Standard Model. Limits on anomalous couplings are also given.

[2] AAD 16BL study VBF $H^0 \rightarrow \tau\tau$ with an effective Lagrangian including a CP odd term in 20.3 fb^{-1} of pp collisions at $E_{\rm cm}$ = 8 TeV. The measurement is consistent with the expectation of the Standard Model. The CP-mixing parameter $\widetilde{d}$ (a dimensionless coupling $\widetilde{d}=-(m^2_W/\Lambda^2)f_{\widetilde{W}W}$) is constrained to the interval of ($-$0.11, 0.05) at 68% CL under the assumption of $\widetilde{d} = \widetilde{d}_B$.

[3] KHACHATRYAN 16AB search for anomalous pseudoscalar couplings of the Higgs boson to W and Z with 18.9 fb^{-1} of pp collisions at $E_{\rm cm}$ = 8 TeV. See their Table 5 and Figs 5 and 6 for limits on possible anomalous pseudoscalar coupling parameters.

[4] AAD 15AX compare the $J^{CP}= 0^+$ Standard Model assignment with other J^{CP} hypotheses in 20.3 fb^{-1} of pp collisions at $E_{\rm cm}$ = 8 TeV, using the process $H^0 \rightarrow WW^* \rightarrow e\nu\mu\nu$. 2^+ hypotheses are excluded at 84.5–99.4%CL, 0^- at 96.5%CL, 0^+ (field strength coupling) at 70.8%CL. See their Fig. 19 for limits on possible CP mixture parameters.

[5] AAD 15CI compare the $J^{CP}= 0^+$ Standard Model assignment with other J^{CP} hypotheses in 4.5 fb^{-1} of pp collisions at $E_{\rm cm}$ = 7 TeV and 20.3 fb^{-1} at $E_{\rm cm}$ = 8 TeV, using the processes $H^0 \rightarrow ZZ^* \rightarrow 4\ell$. $H^0 \rightarrow \gamma\gamma$ and combine with AAD 15AX data. 0^+ (field strength coupling), 0^- and several 2^+ hypotheses are excluded at more than 99.9% CL. See their Tables 7–9 for limits on possible CP mixture parameters.

[6] AALTONEN 15 combine AALTONEN 15B and ABAZOV 14F data. An upper limit of 0.36 of the Standard Model production rate at 95% CL is obtained both for a 0^- and a 2^+ state. Assuming the SM event rate, the $J^{CP} = 0^-$ (2^+) hypothesis is excluded at the 5.0σ (4.9σ) level.

[7] AALTONEN 15B compare the $J^{CP} = 0^+$ Standard Model assignment with other J^{CP} hypotheses in 9.45 fb^{-1} of $p\overline{p}$ collisions at $E_{\rm cm}$ = 1.96 TeV, using the processes $ZH^0 \rightarrow \ell\ell b\overline{b}$, $WH^0 \rightarrow \ell\nu b\overline{b}$, and $ZH^0 \rightarrow \nu\nu b\overline{b}$. Bounds on the production rates of 0^- and 2^+ (graviton-like) states are set, see their tables II and III.

[8] KHACHATRYAN 15Y compare the $J^{CP} = 0^+$ Standard Model assignment with other J^{CP} hypotheses in up to 5.1 fb^{-1} of pp collisions at $E_{\rm cm}$ = 7 TeV and up to 19.7 fb^{-1} at $E_{\rm cm}$ = 8 TeV, using the processes $H^0 \rightarrow 4\ell$, $H^0 \rightarrow WW^*$, and $H^0 \rightarrow \gamma\gamma$. 0^- is excluded at 99.98% CL, and several 2^+ hypotheses are excluded at more than 99% CL. Spin 1 models are excluded at more than 99.999% CL in ZZ^* and WW^* modes. Limits on anomalous couplings and several cross section fractions, treating the case of CP-mixed states, are also given.

[9] ABAZOV 14F compare the $J^{CP}= 0^+$ Standard Model assignment with $J^{CP}= 0^-$ and 2^+ (graviton-like coupling) hypotheses in up to 9.7 fb^{-1} of $p\overline{p}$ collisions at $E_{\rm cm}$ = 1.96 TeV. They use kinematic correlations between the decay products of the vector boson and the Higgs boson in the final states $ZH \rightarrow \ell\ell b\overline{b}$, $WH \rightarrow \ell\nu b\overline{b}$, and $ZH \rightarrow \nu\nu b\overline{b}$. The 0^- (2^+) hypothesis is excluded at 97.6% CL (99.0% CL). In order to treat the case of a possible mixture of a 0^+ state with another J^{CP} state, the cross section

fractions $f_X = \sigma_X/(\sigma_{0+} + \sigma_X)$ are considered, where $X = 0^-$, 2^+. Values for f_{0-} (f_{2+}) above 0.80 (0.67) are excluded at 95% CL under the assumption that the total cross section is that of the SM Higgs boson.

[10] CHATRCHYAN 14AA compare the $J^{CP} = 0^+$ Standard Model assignment with various J^{CP} hypotheses in 5.1 fb^{-1} of pp collisions at E_{cm} = 7 TeV and 19.7 fb^{-1} at E_{cm} = 8 TeV. $J^{CP} = 0^-$ and $1^\pm$ hypotheses are excluded at 99% CL, and several $J = 2$ hypotheses are excluded at 95% CL. In order to treat the case of a possible mixture of a 0^+ state with another J^{CP} state, the cross section fraction $f_{a3} = |a_3|^2\ \sigma_3\ /\ (|a_1|^2\ \sigma_1 + |a_2|^2\ \sigma_2 + |a_3|^2\ \sigma_3)$ is considered, where the case $a_3 = 1$, $a_1 = a_2 = 0$ corresponds to a pure CP-odd state. Assuming $a_2 = 0$, a value for f_{a3} above 0.51 is excluded at 95% CL.

[11] CHATRCHYAN 14G compare the $J^{CP} = 0^+$ Standard Model assignment with $J^{CP} = 0^-$ and 2^+ (graviton-like coupling) hypotheses in 4.9 fb^{-1} of pp collisions at E_{cm} = 7 TeV and 19.4 fb^{-1} at E_{cm} = 8 TeV. Varying the fraction of the production of the 2^+ state via gg and $q\overline{q}$, 2^+ hypotheses are disfavored at CL between 83.7 and 99.8%. The 0^- hypothesis is disfavored against 0^+ at the 65.3% CL.

[12] KHACHATRYAN 14P compare the $J^{CP} = 0^+$ Standard Model assignment with a 2^+ (graviton-like coupling) hypothesis in 5.1 fb^{-1} of pp collisions at E_{cm} = 7 TeV and 19.7 fb^{-1} at E_{cm} = 8 TeV. Varying the fraction of the production of the 2^+ state via gg and $q\overline{q}$, 2^+ hypotheses are disfavored at CL between 71 and 94%.

[13] AAD 13AJ compare the spin 0, CP-even hypothesis with specific alternative hypotheses of spin 0, CP-odd, spin 1, CP-even and CP-odd, and spin 2, CP-even models using the Higgs boson decays $H \to \gamma\gamma$, $H \to ZZ^* \to 4\ell$ and $H \to WW^* \to \ell\nu\ell\nu$ and combinations thereof. The data are compatible with the spin 0, CP-even hypothesis, while all other tested hypotheses are excluded at confidence levels above 97.8%.

[14] CHATRCHYAN 13J study angular distributions of the lepton pairs in the ZZ^* channel where both Z bosons decay to e or μ pairs. Under the assumption that the observed particle has spin 0, the data are found to be consistent with the pure CP-even hypothesis, while the pure CP-odd hypothesis is disfavored.

H^0 DECAY WIDTH

The total decay width for a light Higgs boson with a mass in the observed range is not expected to be directly observable at the LHC. For the case of the Standard Model the prediction for the total width is about 4 MeV, which is three orders of magnitude smaller than the experimental mass resolution. There is no indication from the results observed so far that the natural width is broadened by new physics effects to such an extent that it could be directly observable. Furthermore, as all LHC Higgs channels rely on the identification of Higgs decay products, the total Higgs width cannot be measured indirectly without additional assumptions. The different dependence of on-peak and off-peak contributions on the total width in Higgs decays to ZZ^* and interference effects between signal and background in Higgs decays to $\gamma\gamma$ can provide additional information in this context. Constraints on the total width from the combination of on-peak and off-peak contributions in Higgs decays to ZZ^* rely on the assumption of equal on- and off-shell effective couplings. Without an experimental determination of the total width or further theoretical assumptions, only ratios of couplings can be determined at the LHC rather than absolute values of couplings.

VALUE (GeV)	CL%	DOCUMENT ID	TECN	COMMENT
<0.013	95	[1] KHACHATRY...16BA	CMS	pp, 7, 8 TeV, $ZZ^{(*)}$, $WW^{(*)}$
<1.7	95	[2] KHACHATRY...15AM	CMS	pp, 7, 8 TeV
>3.5 $\times 10^{-12}$	95	[3] KHACHATRY...15BA	CMS	pp, 7, 8 TeV, flight distance
<5.0	95	[4] AAD 14W	ATLS	pp, 7, 8 TeV, $\gamma\gamma$
<2.6	95	[4] AAD 14W	ATLS	pp, 7, 8 TeV, $ZZ^* \to 4\ell$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<0.026	95	[5] KHACHATRY...16BA	CMS	pp, 7, 8 TeV, $WW^{(*)}$
<0.0227	95	[6] AAD 15BE	ATLS	pp, 8 TeV, $ZZ^{(*)}$, $WW^{(*)}$
<0.046	95	[7] KHACHATRY...15BA	CMS	pp, 7, 8 TeV, $ZZ^{(*)} \to 4\ell$
<3.4	95	[8] CHATRCHYAN 14AA	CMS	pp, 7, 8 TeV, $ZZ^* \to 4\ell$
<0.022	95	[9] KHACHATRY...14D	CMS	pp, 7, 8 TeV, $ZZ^{(*)}$
<2.4	95	[10] KHACHATRY...14P	CMS	pp, 7, 8 TeV, $\gamma\gamma$

[1] KHACHATRYAN 16BA combine the $WW^{(*)}$ result with $ZZ^{(*)}$ results of KHACHATRYAN 15BA and KHACHATRYAN 14D.

[2] KHACHATRYAN 15AM combine $\gamma\gamma$ and $ZZ^* \to 4\ell$ results. The expected limit is 2.3 GeV.

[3] KHACHATRYAN 15BA derive a lower limit on the total width from an upper limit on the decay flight distance $\tau < 1.9 \times 10^{-13}$ s. 5.1 fb^{-1} of pp collisions at $E_{\rm cm} = 7$ TeV and 19.7 fb^{-1} at 8 TeV are used.

[4] AAD 14W use 4.5 fb^{-1} of pp collisions at $E_{\rm cm} = 7$ TeV and 20.3 fb^{-1} at 8 TeV. The expected limit is 6.2 GeV.

[5] KHACHATRYAN 16BA derive constraints on the total width from comparing $WW^{(*)}$ production via on-shell and off-shell H^0 using 4.9 fb^{-1} of pp collisions at $E_{\rm cm} = 7$ TeV and 19.4 fb^{-1} at 8 TeV.

[6] AAD 15BE derive constraints on the total width from comparing $ZZ^{(*)}$ and $WW^{(*)}$ production via on-shell and off-shell H^0 using 20.3 fb^{-1} of pp collisions at $E_{\rm cm} = 8$ TeV. The K factor for the background processes is assumed to be equal to that for the signal.

[7] KHACHATRYAN 15BA derive constraints on the total width from comparing $ZZ^{(*)}$ production via on-shell and off-shell H^0 with an unconstrained anomalous coupling. 4ℓ final states in 5.1 fb^{-1} of pp collisions at $E_{\rm cm} = 7$ TeV and 19.7 fb^{-1} at $E_{\rm cm} = 8$ TeV are used.

[8] CHATRCHYAN 14AA use 5.1 fb^{-1} of pp collisions at $E_{\rm cm} = 7$ TeV and 19.7 fb^{-1} at $E_{\rm cm} = 8$ TeV. The expected limit is 2.8 GeV.

[9] KHACHATRYAN 14D derive constraints on the total width from comparing $ZZ^{(*)}$ production via on-shell and off-shell H^0. 4ℓ and $\ell\ell\nu\nu$ final states in 5.1 fb^{-1} of pp collisions at $E_{\rm cm} = 7$ TeV and 19.7 fb^{-1} at $E_{\rm cm} = 8$ TeV are used.

[10] KHACHATRYAN 14P use 5.1 fb^{-1} of pp collisions at $E_{\rm cm} = 7$ TeV and 19.7 fb^{-1} at $E_{\rm cm} = 8$ TeV. The expected limit is 3.1 GeV.

H^0 DECAY MODES

	Mode	Fraction (Γ_i/Γ)	Confidence level
Γ_1	WW^*		
Γ_2	ZZ^*		
Γ_3	$\gamma\gamma$		
Γ_4	$b\bar{b}$		

Γ_5	$e^+ e^-$	$< 1.9 \times 10^{-3}$	95%
Γ_6	$\mu^+ \mu^-$		
Γ_7	$\tau^+ \tau^-$		
Γ_8	$Z\gamma$		
Γ_9	$J/\psi\gamma$	$< 1.5 \times 10^{-3}$	95%
Γ_{10}	$\Upsilon(1S)\gamma$	$< 1.3 \times 10^{-3}$	95%
Γ_{11}	$\Upsilon(2S)\gamma$	$< 1.9 \times 10^{-3}$	95%
Γ_{12}	$\Upsilon(3S)\gamma$	$< 1.3 \times 10^{-3}$	95%
Γ_{13}	$\phi(1020)\gamma$	$< 1.4 \times 10^{-3}$	95%
Γ_{14}	$e\mu$	$< 3.5 \times 10^{-4}$	95%
Γ_{15}	$e\tau$	$< 6.9 \times 10^{-3}$	95%
Γ_{16}	$\mu\tau$	< 1.51 %	95%
Γ_{17}	invisible	<28 %	95%

H^0 BRANCHING RATIOS

$\Gamma(e^+ e^-)/\Gamma_{total}$ — Γ_5/Γ

VALUE	CL%	DOCUMENT ID	TECN
$<1.9 \times 10^{-3}$	95	[1] KHACHATRY...15H	CMS

[1] KHACHATRYAN 15H use 5.0 fb^{-1} of pp collisions at E_{cm} = 7 TeV and 19.7 fb^{-1} at 8 TeV.

$\Gamma(J/\psi\gamma)/\Gamma_{total}$ — Γ_9/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<1.5 \times 10^{-3}$	95	[1] KHACHATRY...16B	CMS	8 TeV
$<1.5 \times 10^{-3}$	95	[2] AAD 15I	ATLS	8 TeV

[1] KHACHATRYAN 16B use 19.7 fb^{-1} of pp collision data at 8 TeV.
[2] AAD 15I use 19.7 fb^{-1} of pp collision data at 8 TeV.

$\Gamma(\Upsilon(1S)\gamma)/\Gamma_{total}$ — Γ_{10}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<1.3 \times 10^{-3}$	95	[1] AAD 15I	ATLS	8 TeV

[1] AAD 15I use 19.7 fb^{-1} of pp collision data at 8 TeV.

$\Gamma(\Upsilon(2S)\gamma)/\Gamma_{total}$ — Γ_{11}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<1.9 \times 10^{-3}$	95	[1] AAD 15I	ATLS	8 TeV

[1] AAD 15I use 19.7 fb^{-1} of pp collision data at 8 TeV.

$\Gamma(\Upsilon(3S)\gamma)/\Gamma_{total}$ — Γ_{12}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<1.3 \times 10^{-3}$	95	[1] AAD 15I	ATLS	8 TeV

[1] AAD 15I use 19.7 fb^{-1} of pp collision data at 8 TeV.

$\Gamma(\phi(1020)\gamma)/\Gamma_{total}$ — Γ_{13}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<1.4 × 10⁻³	95	[1] AABOUD	16K	ATLS	pp at 13 TeV

[1] AABOUD 16K use 2.7 fb^{-1} of pp collision data at 13 TeV.

$\Gamma(e\mu)/\Gamma_{total}$ — Γ_{14}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<3.5 \times 10^{-4}$	95	[1] KHACHATRY...	16CD	CMS	pp, 8 TeV

[1] KHACHATRYAN 16CD search for $H^0 \rightarrow e\mu$ in 19.7 fb^{-1} of pp collisions at E_{cm} = 8 TeV. The limit constrains the $Y_{e\mu}$ Yukawa coupling to $\sqrt{|Y_{e\mu}|^2 + |Y_{\mu e}|^2} < 5.4 \times 10^{-4}$ at 95% CL (see their Fig. 6).

$\Gamma(e\tau)/\Gamma_{total}$ — Γ_{15}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<6.9 \times 10^{-3}$	95	[1] KHACHATRY...	16CD	CMS	pp, 8 TeV

[1] KHACHATRYAN 16CD search for $H^0 \rightarrow e\tau$ in 19.7 fb^{-1} of pp collisions at E_{cm} = 8 TeV. The limit constrains the $Y_{e\tau}$ Yukawa coupling to $\sqrt{|Y_{e\tau}|^2 + |Y_{\tau e}|^2} < 2.4 \times 10^{-3}$ at 95% CL (see their Fig. 6).

$\Gamma(\mu\tau)/\Gamma_{total}$ — Γ_{16}/Γ

VALUE	CL%	DOCUMENT ID		TECN
$<1.51 \times 10^{-2}$	95	[1] KHACHATRY...	15Q	CMS

[1] KHACHATRYAN 15Q search for $H^0 \rightarrow \mu\tau$ with τ decaying electronically or hadronically in 19.7 fb^{-1} of pp collisions at E_{cm} = 8 TeV. The fit gives B($H^0 \rightarrow \mu\tau$) = $(0.84^{+0.39}_{-0.37})$% with a significance of 2.4 σ.

$\Gamma(\text{invisible})/\Gamma_{total}$ — Γ_{17}/Γ

Invisible final states.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.28	95	[1] AAD	16AF	ATLS	$pp \rightarrow qqH^0X$, 8 TeV
<0.34	95	[2] AAD	16AN	LHC	pp, 7, 8 TeV
<0.58	95	[3] CHATRCHYAN	14B	CMS	$pp \rightarrow H^0ZX$, qqH^0X
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.78	95	[4] AAD	15BD	ATLS	$pp \rightarrow H^0W/ZX$, 8 TeV
<0.75	95	[5] AAD	14O	ATLS	$pp \rightarrow H^0ZX$, 7, 8 TeV
<0.81	95	[6] CHATRCHYAN	14B	CMS	$pp \rightarrow H^0ZX$, 7, 8 TeV
<0.65	95	[7] CHATRCHYAN	14B	CMS	$pp \rightarrow qqH^0X$, 8 TeV

[1] AAD 16AF search for $pp \rightarrow qqH^0X$ (VBF) with H^0 decaying to invisible final states in 20.3 fb^{-1} at E_{cm} = 8 TeV. The quoted limit on the branching ratio is given for m_{H^0} = 125 GeV and assumes the Standard Model rates for VBF and gluon-fusion production.

[2] AAD 16AN perform fits to the ATLAS and CMS data at E_{cm} = 7 and 8 TeV. The branching fraction of decays into BSM particles that are invisible or into undetected decay modes is measured for m_{H^0} = 125.09 GeV.

[3] CHATRCHYAN 14B search for $pp \rightarrow H^0ZX$, $Z \rightarrow \ell\ell$ and $Z \rightarrow b\overline{b}$, and also $pp \rightarrow qqH^0X$ with H^0 decaying to invisible final states using data at E_{cm} = 7 and 8 TeV. The quoted limit on the branching ratio is obtained from a combination of the limits

from $H^0 Z$ and $q q H^0$. It is given for m_{H^0} = 125 GeV and assumes the Standard Model rates for the two production processes.

[4] AAD 15BD search for $p p \rightarrow H^0 W X$ and $p p \rightarrow H^0 Z X$ with W or Z decaying hadronically and H^0 decaying to invisible final states using data at E_{cm} = 8 TeV. The quoted limit is given for m_{H^0} = 125 GeV, assumes the Standard Model rates for the production processes and is based on a combination of the contributions from $H^0 W$, $H^0 Z$ and the gluon-fusion process.

[5] AAD 14O search for $p p \rightarrow H^0 Z X$, $Z \rightarrow \ell \ell$, with H^0 decaying to invisible final states in 4.5 fb^{-1} at E_{cm} = 7 TeV and 20.3 fb^{-1} at E_{cm} = 8 TeV. The quoted limit on the branching ratio is given for m_{H^0} = 125.5 GeV and assumes the Standard Model rate for $H^0 Z$ production.

[6] CHATRCHYAN 14B search for $p p \rightarrow H^0 Z X$ with H^0 decaying to invisible final states and $Z \rightarrow \ell \ell$ in 4.9 fb^{-1} at E_{cm} = 7 TeV and 19.7 fb^{-1} at E_{cm} = 8 TeV, and also with $Z \rightarrow b \overline{b}$ in 18.9 fb^{-1} at E_{cm} = 8 TeV. The quoted limit on the branching ratio is given for m_{H^0} = 125 GeV and assumes the Standard Model rate for $H^0 Z$ production.

[7] CHATRCHYAN 14B search for $p p \rightarrow q q H^0 X$ (vector boson fusion) with H^0 decaying to invisible final states in 19.5 fb^{-1} at E_{cm} = 8 TeV. The quoted limit on the branching ratio is given for m_{H^0} = 125 GeV and assumes the Standard Model rate for $q q H^0$ production.

H^0 SIGNAL STRENGTHS IN DIFFERENT CHANNELS

The H^0 signal strength in a particular final state $x x$ is given by the cross section times branching ratio in this channel normalized to the Standard Model (SM) value, $\sigma \cdot$ B($H^0 \rightarrow x x$) / ($\sigma \cdot$ B($H^0 \rightarrow x x$))$_{SM}$, for the specified mass value of H^0. For the SM predictions, see DITTMAIER 11, DITTMAIER 12, and HEINEMEYER 13A. Results for fiducial and differential cross sections are also listed below.

Combined Final States

VALUE	DOCUMENT ID	TECN	COMMENT
1.10±0.11 OUR AVERAGE			
$1.09 \pm 0.07 \pm 0.04 \pm 0.03 ^{+0.07}_{-0.06}$	[1,2] AAD 16AN	LHC	$p p$, 7, 8 TeV
$1.44 ^{+0.59}_{-0.56}$	[3] AALTONEN 13M	TEVA	$p \overline{p} \rightarrow H^0 X$, 1.96 TeV
• • • We do not use the following data for averages, fits, limits, etc. • • •			
$1.20 \pm 0.10 \pm 0.06 \pm 0.04 ^{+0.08}_{-0.07}$	[2] AAD 16AN	ATLS	$p p$, 7, 8 TeV
$0.97 \pm 0.09 \pm 0.05 ^{+0.04}_{-0.03} {}^{+0.07}_{-0.06}$	[2] AAD 16AN	CMS	$p p$, 7, 8 TeV
$1.18 \pm 0.10 \pm 0.07 ^{+0.08}_{-0.07}$	[4] AAD 16K	ATLS	$p p$, 7, 8 TeV
$0.75 ^{+0.28}_{-0.26} {}^{+0.13}_{-0.11} {}^{+0.08}_{-0.05}$	[4] AAD 16K	ATLS	$p p$, 7 TeV
$1.28 \pm 0.11 ^{+0.08}_{-0.07} {}^{+0.10}_{-0.08}$	[4] AAD 16K	ATLS	$p p$, 8 TeV
	[5] AAD 15P	ATLS	$p p$, 8 TeV, cross section
$1.00 \pm 0.09 \pm 0.07 ^{+0.08}_{-0.07}$	[6] KHACHATRY...15AM	CMS	$p p$, 7, 8 TeV

$1.33^{+0.14}_{-0.10}\pm0.15$	[7] AAD	13AK	ATLS	pp, 7 and 8 TeV
$1.54^{+0.77}_{-0.73}$	[8] AALTONEN	13L	CDF	$p\overline{p} \rightarrow H^0 X$, 1.96 TeV
$1.40^{+0.92}_{-0.88}$	[9] ABAZOV	13L	D0	$p\overline{p} \rightarrow H^0 X$, 1.96 TeV
1.4 ± 0.3	[10] AAD	12AI	ATLS	$pp \rightarrow H^0 X$, 7, 8 TeV
1.2 ± 0.4	[10] AAD	12AI	ATLS	$pp \rightarrow H^0 X$, 7 TeV
1.5 ± 0.4	[10] AAD	12AI	ATLS	$pp \rightarrow H^0 X$, 8 TeV
0.87 ± 0.23	[11] CHATRCHYAN	12N	CMS	$pp \rightarrow H^0 X$, 7, 8 TeV

[1] AAD 16AN perform fits to the ATLAS and CMS data at E_{cm} = 7 and 8 TeV. The signal strengths for individual production processes are $1.03^{+0.16}_{-0.14}$ for gluon fusion, $1.18^{+0.25}_{-0.23}$ for vector boson fusion, $0.89^{+0.40}_{-0.38}$ for WH^0 production, $0.79^{+0.38}_{-0.36}$ for ZH^0 production, and $2.3^{+0.7}_{-0.6}$ for $t\overline{t}H^0$ production.

[2] AAD 16AN: The uncertainties represent statistics, experimental systematics, theory systematics on the background, and theory systematics on the signal. The quoted signal strengths are given for m_{H^0} = 125.09 GeV. In the fit, relative branching ratios and relative production cross sections are fixed to those in the Standard Model.

[3] AALTONEN 13M combine all Tevatron data from the CDF and D0 Collaborations with up to 10.0 fb^{-1} and 9.7 fb^{-1}, respectively, of $p\overline{p}$ collisions at E_{cm} = 1.96 TeV. The quoted signal strength is given for m_{H^0} = 125 GeV.

[4] AAD 16K use up to 4.7 fb^{-1} of pp collisions at E_{cm} = 7 TeV and up to 20.3 fb^{-1} at E_{cm} = 8 TeV. The third uncertainty in the measurement is theory systematics. The signal strengths for individual production modes are $1.23 \pm 0.14^{+0.09}_{-0.08}{}^{+0.16}_{-0.12}$ for gluon fusion, $1.23^{+0.28}_{-0.27}{}^{+0.13}_{-0.12}{}^{+0.11}_{-0.09}$ for vector boson fusion, $0.80^{+0.31}_{-0.30} \pm 0.17^{+0.10}_{-0.05}$ for W/ZH^0 production, and $1.81^{+0.52}_{-0.50}{}^{+0.58}_{-0.55}{}^{+0.31}_{-0.12}$ for $t\overline{t}H^0$ production. The quoted signal strengths are given for m_{H^0} = 125.36 GeV.

[5] AAD 15P measure total and differential cross sections of the process $pp \rightarrow H^0 X$ at E_{cm} = 8 TeV with 20.3 fb^{-1}. $\gamma\gamma$ and 4ℓ final states are used. $\sigma(pp \rightarrow H^0 X)$ = 33.0 ± 5.3 ± 1.6 pb is given. See their Figs. 2 and 3 for data on differential cross sections.

[6] KHACHATRYAN 15AM use up to 5.1 fb^{-1} of pp collisions at E_{cm} = 7 TeV and up to 19.7 fb^{-1} at E_{cm} = 8 TeV. The third uncertainty in the measurement is theory systematics. Fits to each production mode give the value of $0.85^{+0.19}_{-0.16}$ for gluon fusion, $1.16^{+0.37}_{-0.34}$ for vector boson fusion, $0.92^{+0.38}_{-0.36}$ for WH^0, ZH^0 production, and $2.90^{+1.08}_{-0.94}$ for $t\overline{t}H^0$ production.

[7] AAD 13AK use 4.7 fb^{-1} of pp collisions at E_{cm} = 7 TeV and 20.7 fb^{-1} at E_{cm} = 8 TeV. The combined signal strength is based on the $\gamma\gamma$, $ZZ^* \rightarrow 4\ell$, and $WW^* \rightarrow \ell\nu\ell\nu$ channels. The quoted signal strength is given for m_{H^0} = 125.5 GeV. Reported statistical error value modified following private communication with the experiment.

[8] AALTONEN 13L combine all CDF results with 9.45–10.0 fb^{-1} of $p\overline{p}$ collisions at E_{cm} = 1.96 TeV. The quoted signal strength is given for m_{H^0} = 125 GeV.

[9] ABAZOV 13L combine all D0 results with up to 9.7 fb^{-1} of $p\overline{p}$ collisions at E_{cm} = 1.96 TeV. The quoted signal strength is given for m_{H^0} = 125 GeV.

[10] AAD 12AI obtain results based on 4.6–4.8 fb^{-1} of pp collisions at E_{cm} = 7 TeV and 5.8–5.9 fb^{-1} at E_{cm} = 8 TeV. An excess of events over background with a local significance of 5.9 σ is observed at m_{H^0} = 126 GeV. The quoted signal strengths are given for m_{H^0} = 126 GeV. See also AAD 12DA.

[11] CHATRCHYAN 12N obtain results based on 4.9–5.1 fb^{-1} of pp collisions at E_{cm} = 7 TeV and 5.1–5.3 fb^{-1} at E_{cm} = 8 TeV. An excess of events over background with a local significance of 5.0 σ is observed at about m_{H^0} = 125 GeV. The combined signal strength is based on the $\gamma\gamma$, ZZ^*, WW^*, $\tau^+\tau^-$, and $b\overline{b}$ channels. The quoted signal strength is given for m_{H^0} = 125.5 GeV. See also CHATRCHYAN 13Y.

WW^* Final State

VALUE		DOCUMENT ID	TECN	COMMENT
$1.08^{+0.18}_{-0.16}$ OUR AVERAGE				
$1.09^{+0.18}_{-0.16}$	[1,2]	AAD 16AN	LHC	pp, 7, 8 TeV
$0.94^{+0.85}_{-0.83}$	[3]	AALTONEN 13M	TEVA	$p\overline{p} \to H^0 X$, 1.96 TeV
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$1.22^{+0.23}_{-0.21}$	[2]	AAD 16AN	ATLS	pp, 7, 8 TeV
$0.90^{+0.23}_{-0.21}$	[2]	AAD 16AN	CMS	pp, 7, 8 TeV
	[4]	AAD 16AO	ATLS	pp, 8 TeV, cross sections
$1.18 \pm 0.16^{+0.17}_{-0.14}$	[5]	AAD 16K	ATLS	pp, 7, 8 TeV
$1.09^{+0.16}_{-0.15}{}^{+0.17}_{-0.14}$	[6]	AAD 15AA	ATLS	pp, 7, 8 TeV
$3.0\ {}^{+1.3}_{-1.1}\ {}^{+1.0}_{-0.7}$	[7]	AAD 15AQ	ATLS	$pp \to H^0 W/Z X$, 7, 8 TeV
$1.16^{+0.16}_{-0.15}{}^{+0.18}_{-0.15}$	[8]	AAD 15AQ	ATLS	pp, 7, 8 TeV
$0.72 \pm 0.12 \pm 0.10^{+0.12}_{-0.10}$	[9]	CHATRCHYAN 14G	CMS	pp, 7, 8 TeV
$0.99^{+0.31}_{-0.28}$	[10]	AAD 13AK	ATLS	pp, 7 and 8 TeV
$0.00^{+1.78}_{-0.00}$	[11]	AALTONEN 13L	CDF	$p\overline{p} \to H^0 X$, 1.96 TeV
$1.90^{+1.63}_{-1.52}$	[12]	ABAZOV 13L	D0	$p\overline{p} \to H^0 X$, 1.96 TeV
1.3 ± 0.5	[13]	AAD 12AI	ATLS	$pp \to H^0 X$, 7, 8 TeV
0.5 ± 0.6	[13]	AAD 12AI	ATLS	$pp \to H^0 X$, 7 TeV
1.9 ± 0.7	[13]	AAD 12AI	ATLS	$pp \to H^0 X$, 8 TeV
$0.60^{+0.42}_{-0.37}$	[14]	CHATRCHYAN 12N	CMS	$pp \to H^0 X$, 7, 8 TeV

[1] AAD 16AN perform fits to the ATLAS and CMS data at E_{cm} = 7 and 8 TeV. The signal strengths for individual production processes are 0.84 ± 0.17 for gluon fusion, 1.2 ± 0.4 for vector boson fusion, $1.6^{+1.2}_{-1.0}$ for WH^0 production, $5.9^{+2.6}_{-2.2}$ for ZH^0 production, and $5.0^{+1.8}_{-1.7}$ for $t\overline{t}H^0$ production.

[2] AAD 16AN: In the fit, relative production cross sections are fixed to those in the Standard Model. The quoted signal strength is given for m_{H^0} = 125.09 GeV.

[3] AALTONEN 13M combine all Tevatron data from the CDF and D0 Collaborations with up to 10.0 fb^{-1} and 9.7 fb^{-1}, respectively, of $p\overline{p}$ collisions at E_{cm} = 1.96 TeV. The quoted signal strength is given for m_{H^0} = 125 GeV.

[4] AAD 16AO measure fiducial total and differential cross sections of gluon fusion process at E_{cm} = 8 TeV with 20.3 fb^{-1} using $H^0 \to WW^* \to e\nu\mu\nu$. The measured fiducial total cross section is 36.0 ± 9.7 fb in their fiducial region (Table 7). See their Fig. 6 for fiducial differential cross sections. The results are given for m_{H^0} = 125 GeV.

[5] AAD 16K use up to 4.7 fb^{-1} of pp collisions at E_{cm} = 7 TeV and up to 20.3 fb^{-1} at E_{cm} = 8 TeV. The quoted signal strength is given for m_{H^0} = 125.36 GeV.

[6] AAD 15AA use 4.5 fb^{-1} of pp collisions at E_{cm} = 7 TeV and 20.3 fb^{-1} at E_{cm} = 8 TeV. The signal strength for the gluon fusion and vector boson fusion mode is $1.02 \pm 0.19^{+0.22}_{-0.18}$ and $1.27^{+0.44}_{-0.40}{}^{+0.30}_{-0.21}$, respectively. The quoted signal strengths are given for m_{H^0} = 125.36 GeV.

[7] AAD 15AQ use 4.5 fb^{-1} of pp collisions at E_{cm} = 7 TeV and 20.3 fb^{-1} at E_{cm} = 8 TeV. The quoted signal strength is given for m_{H^0} = 125.36 GeV.

[8] AAD 15AQ combine their result on W/ZH^0 production with the results of AAD 15AA (gluon fusion and vector boson fusion, slightly updated). The quoted signal strength is given for m_{H^0} = 125.36 GeV.

[9] CHATRCHYAN 14G use 4.9 fb^{-1} of pp collisions at E_{cm} = 7 TeV and 19.4 fb^{-1} at E_{cm} = 8 TeV. The last uncertainty in the measurement is theory systematics. The quoted signal strength is given for m_{H^0} = 125.6 GeV.

[10] AAD 13AK use 4.7 fb^{-1} of pp collisions at E_{cm} = 7 TeV and 20.7 fb^{-1} at E_{cm} = 8 TeV. The quoted signal strength is given for m_{H^0} = 125.5 GeV. Superseded by AAD 15AA.

[11] AALTONEN 13L combine all CDF results with 9.45–10.0 fb^{-1} of $p\overline{p}$ collisions at E_{cm} = 1.96 TeV. The quoted signal strength is given for m_{H^0} = 125 GeV.

[12] ABAZOV 13L combine all D0 results with up to 9.7 fb^{-1} of $p\overline{p}$ collisions at E_{cm} = 1.96 TeV. The quoted signal strength is given for m_{H^0} = 125 GeV.

[13] AAD 12AI obtain results based on 4.7 fb^{-1} of pp collisions at E_{cm} = 7 TeV and 5.8 fb^{-1} at E_{cm} = 8 TeV. The quoted signal strengths are given for m_{H^0} = 126 GeV. See also AAD 12DA.

[14] CHATRCHYAN 12N obtain results based on 4.9 fb^{-1} of pp collisions at E_{cm} = 7 TeV and 5.1 fb^{-1} at E_{cm} = 8 TeV. The quoted signal strength is given for m_{H^0} = 125.5 GeV. See also CHATRCHYAN 13Y.

ZZ^* Final State

VALUE	DOCUMENT ID	TECN	COMMENT
$\mathbf{1.29^{+0.26}_{-0.23}}$	[1,2] AAD 16AN	LHC	pp, 7, 8 TeV
• • • We do not use the following data for averages, fits, limits, etc. • • •			
$1.52^{+0.40}_{-0.34}$	[2] AAD 16AN	ATLS	pp, 7, 8 TeV
$1.04^{+0.32}_{-0.26}$	[2] AAD 16AN	CMS	pp, 7, 8 TeV
$1.46^{+0.35}_{-0.31}{}^{+0.19}_{-0.13}$	[3] AAD 16K	ATLS	pp, 7, 8 TeV
	[4] KHACHATRY... 16AR	CMS	pp, 7, 8 TeV cross sections
$1.44^{+0.34}_{-0.31}{}^{+0.21}_{-0.11}$	[5] AAD 15F	ATLS	$pp \to H^0X$, 7, 8 TeV
	[6] AAD 14AR	ATLS	pp, 8 TeV, differential cross section
$0.93^{+0.26}_{-0.23}{}^{+0.13}_{-0.09}$	[7] CHATRCHYAN 14AA	CMS	pp, 7, 8 TeV
$1.43^{+0.40}_{-0.35}$	[8] AAD 13AK	ATLS	pp, 7 and 8 TeV
$0.80^{+0.35}_{-0.28}$	[9] CHATRCHYAN 13J	CMS	$pp \to H^0X$, 7, 8 TeV
1.2 ± 0.6	[10] AAD 12AI	ATLS	$pp \to H^0X$, 7, 8 TeV
1.4 ± 1.1	[10] AAD 12AI	ATLS	$pp \to H^0X$, 7 TeV
1.1 ± 0.8	[10] AAD 12AI	ATLS	$pp \to H^0X$, 8 TeV
$0.73^{+0.45}_{-0.33}$	[11] CHATRCHYAN 12N	CMS	$pp \to H^0X$, 7, 8 TeV

[1] AAD 16AN perform fits to the ATLAS and CMS data at E_{cm} = 7 and 8 TeV. The signal strengths for individual production processes are $1.13^{+0.34}_{-0.31}$ for gluon fusion and $0.1^{+1.1}_{-0.6}$ for vector boson fusion.

[2] AAD 16AN: In the fit, relative production cross sections are fixed to those in the Standard Model. The quoted signal strength is given for m_{H^0} = 125.09 GeV.

[3] AAD 16K use up to 4.7 fb^{-1} of pp collisions at E_{cm} = 7 TeV and up to 20.3 fb^{-1} at E_{cm} = 8 TeV. The quoted signal strength is given for m_{H^0} = 125.36 GeV.

[4] KHACHATRYAN 16AR use data of 5.1 fb^{-1} at E_{cm} = 7 TeV and 19.7 fb^{-1} at 8 TeV. The fiducial cross sections for the production of 4 leptons via $H^0 \rightarrow 4\ell$ decays are measured to be $0.56^{+0.67}_{-0.44}{}^{+0.21}_{-0.06}$ fb at 7 TeV and $1.11^{+0.41}_{-0.35}{}^{+0.14}_{-0.10}$ fb at 8 TeV in their fiducial region (Table 2). The differential cross sections at E_{cm} = 8 TeV are also shown in Figs. 4 and 5. The results are given for m_{H^0} = 125 GeV.

[5] AAD 15F use 4.5 fb^{-1} of pp collisions at E_{cm} = 7 TeV and 20.3 fb^{-1} at E_{cm} = 8 TeV. The quoted signal strength is given for m_{H^0} = 125.36 GeV. The signal strength for the gluon fusion production mode is $1.66^{+0.45}_{-0.41}{}^{+0.25}_{-0.15}$, while the signal strength for the vector boson fusion production mode is $0.26^{+1.60}_{-0.91}{}^{+0.36}_{-0.23}$.

[6] AAD 14AR measure the cross section for $pp \rightarrow H^0 X$, $H^0 \rightarrow ZZ^*$ using 20.3 fb^{-1} at E_{cm} = 8 TeV. They give $\sigma \cdot B = 2.11^{+0.53}_{-0.47} \pm 0.08$ fb in their fiducial region, where 1.30 ± 0.13 fb is expected in the Standard Model for m_{H^0} = 125.4 GeV. Various differential cross sections are also given, which are in agreement with the Standard Model expectations.

[7] CHATRCHYAN 14AA use 5.1 fb^{-1} of pp collisions at E_{cm} = 7 TeV and 19.7 fb^{-1} at E_{cm} = 8 TeV. The quoted signal strength is given for m_{H^0} = 125.6 GeV. The signal strength for the gluon fusion and $t\bar{t}H$ production mode is $0.80^{+0.46}_{-0.36}$, while the signal strength for the vector boson fusion and WH^0, ZH^0 production mode is $1.7^{+2.2}_{-2.1}$.

[8] AAD 13AK use 4.7 fb^{-1} of pp collisions at E_{cm} = 7 TeV and 20.7 fb^{-1} at E_{cm} = 8 TeV. The quoted signal strength is given for m_{H^0} = 125.5 GeV.

[9] CHATRCHYAN 13J obtain results based on $ZZ \rightarrow 4\ell$ final states in 5.1 fb^{-1} of pp collisions at E_{cm} = 7 TeV and 12.2 fb^{-1} at E_{cm} = 8 TeV. The quoted signal strength is given for m_{H^0} = 125.8 GeV. Superseded by CHATRCHYAN 14AA.

[10] AAD 12AI obtain results based on 4.7–4.8 fb^{-1} of pp collisions at E_{cm} = 7 TeV and 5.8 fb^{-1} at E_{cm} = 8 TeV. The quoted signal strengths are given for m_{H^0} = 126 GeV. See also AAD 12DA.

[11] CHATRCHYAN 12N obtain results based on 4.9–5.1 fb^{-1} of pp collisions at E_{cm} = 7 TeV and 5.1–5.3 fb^{-1} at E_{cm} = 8 TeV. An excess of events over background with a local significance of 5.0 σ is observed at about m_{H^0} = 125 GeV. The quoted signal strengths are given for m_{H^0} = 125.5 GeV. See also CHATRCHYAN 12BY and CHATRCHYAN 13Y.

$\gamma\gamma$ Final State

VALUE	DOCUMENT ID	TECN	COMMENT
1.16±0.18 OUR AVERAGE			
$1.14^{+0.19}_{-0.18}$	[1,2] AAD 16AN	LHC	pp, 7, 8 TeV
$5.97^{+3.39}_{-3.12}$	[3] AALTONEN 13M	TEVA	$p\bar{p} \rightarrow H^0 X$, 1.96 TeV

• • • We do not use the following data for averages, fits, limits, etc. • • •

$1.14^{+0.27}_{-0.25}$	[2] AAD	16AN	ATLS	pp, 7, 8 TeV
$1.11^{+0.25}_{-0.23}$	[2] AAD	16AN	CMS	pp, 7, 8 TeV
	[4] KHACHATRY...	16B	CMS	$H^0 \rightarrow \gamma^* \gamma \rightarrow \ell^+ \ell^- \gamma$
	[5] KHACHATRY...	16G	CMS	differential cross section
$1.17 \pm 0.23^{+0.10}_{-0.08}{}^{+0.12}_{-0.08}$	[6] AAD	14BC	ATLS	$pp \rightarrow H^0 X$, 7, 8 TeV
	[7] AAD	14BJ	ATLS	pp, 8 TeV, differential cross section
$1.14 \pm 0.21^{+0.09}_{-0.05}{}^{+0.13}_{-0.09}$	[8] KHACHATRY...	14P	CMS	pp, 7, 8 TeV
$1.55^{+0.33}_{-0.28}$	[9] AAD	13AK	ATLS	pp, 7 and 8 TeV
$7.81^{+4.61}_{-4.42}$	[10] AALTONEN	13L	CDF	$p\overline{p} \rightarrow H^0 X$, 1.96 TeV
$4.20^{+4.60}_{-4.20}$	[11] ABAZOV	13L	D0	$p\overline{p} \rightarrow H^0 X$, 1.96 TeV
1.8 ± 0.5	[12] AAD	12AI	ATLS	$pp \rightarrow H^0 X$, 7, 8 TeV
2.2 ± 0.7	[12] AAD	12AI	ATLS	$pp \rightarrow H^0 X$, 7 TeV
1.5 ± 0.6	[12] AAD	12AI	ATLS	$pp \rightarrow H^0 X$, 8 TeV
$1.54^{+0.46}_{-0.42}$	[13] CHATRCHYAN	12N	CMS	$pp \rightarrow H^0 X$, 7, 8 TeV

[1] AAD 16AN perform fits to the ATLAS and CMS data at E_{cm} = 7 and 8 TeV. The signal strengths for individual production processes are $1.10^{+0.23}_{-0.22}$ for gluon fusion, 1.3 ± 0.5 for vector boson fusion, $0.5^{+1.3}_{-1.2}$ for $W H^0$ production, $0.5^{+3.0}_{-2.5}$ for $Z H^0$ production, and $2.2^{+1.6}_{-1.3}$ for $t\overline{t} H^0$ production.

[2] AAD 16AN: In the fit, relative production cross sections are fixed to those in the Standard Model. The quoted signal strength is given for m_{H^0} = 125.09 GeV.

[3] AALTONEN 13M combine all Tevatron data from the CDF and D0 Collaborations with up to 10.0 fb^{-1} and 9.7 fb^{-1}, respectively, of $p\overline{p}$ collisions at E_{cm} = 1.96 TeV. The quoted signal strength is given for m_{H^0} = 125 GeV.

[4] KHACHATRYAN 16B search for $H^0 \rightarrow \gamma^* \gamma \rightarrow e^+ e^- \gamma$ and $\mu^+ \mu^- \gamma$ (with m($\ell^+ \ell^-$) < 20 GeV) in 19.7 fb^{-1} of pp collisions at E_{cm} = 8 TeV. An upper limit of 6.7 times the Standard Model expectation is obtained at 95% CL. See their Fig. 6 for limits on individual channels.

[5] KHACHATRYAN 16G measure fiducial and differential cross sections of the process $pp \rightarrow H^0 X$, $H^0 \rightarrow \gamma\gamma$ at E_{cm} = 8 TeV with 19.7 fb^{-1}. See their Figs. 4–6 and Table 1 for data.

[6] AAD 14BC use 4.5 fb^{-1} of pp collisions at E_{cm} = 7 TeV and 20.3 fb^{-1} at E_{cm} = 8 TeV. The last uncertainty in the measurement is theory systematics. The quoted signal strength is given for m_{H^0} = 125.4 GeV. The signal strengths for the individual production modes are: 1.32 ± 0.38 for gluon fusion, 0.8 ± 0.7 for vector boson fusion, 1.0 ± 1.6 for $W H^0$ production, $0.1^{+3.7}_{-0.1}$ for $Z H^0$ production, and $1.6^{+2.7}_{-1.8}$ for $t\overline{t} H^0$ production.

[7] AAD 14BJ measure fiducial and differential cross sections of the process $pp \rightarrow H^0 X$, $H^0 \rightarrow \gamma\gamma$ at E_{cm} = 8 TeV with 20.3 fb^{-1}. See their Table 3 and Figs. 3–12 for data.

[8] KHACHATRYAN 14P use 5.1 fb^{-1} of pp collisions at E_{cm} = 7 TeV and 19.7 fb^{-1} at E_{cm} = 8 TeV. The last uncertainty in the measurement is theory systematics. The quoted signal strength is given for m_{H^0} = 124.7 GeV. The signal strength for the gluon

fusion and $t\bar{t}H$ production mode is $1.13^{+0.37}_{-0.31}$, while the signal strength for the vector boson fusion and WH^0, ZH^0 production mode is $1.16^{+0.63}_{-0.58}$.

[9] AAD 13AK use 4.7 fb^{-1} of pp collisions at E_{cm} = 7 TeV and 20.7 fb^{-1} at E_{cm} = 8 TeV. The quoted signal strength is given for m_{H^0} = 125.5 GeV.

[10] AALTONEN 13L combine all CDF results with 9.45–10.0 fb^{-1} of $p\bar{p}$ collisions at E_{cm} = 1.96 TeV. The quoted signal strength is given for m_{H^0} = 125 GeV.

[11] ABAZOV 13L combine all D0 results with up to 9.7 fb^{-1} of $p\bar{p}$ collisions at E_{cm} = 1.96 TeV. The quoted signal strength is given for m_{H^0} = 125 GeV.

[12] AAD 12AI obtain results based on 4.8 fb^{-1} of pp collisions at E_{cm} = 7 TeV and 5.9 fb^{-1} at E_{cm} = 8 TeV. The quoted signal strengths are given for m_{H^0} = 126 GeV. See also AAD 12DA.

[13] CHATRCHYAN 12N obtain results based on 5.1 fb^{-1} of pp collisions at E_{cm}=7 TeV and 5.3 fb^{-1} at E_{cm}=8 TeV. The quoted signal strength is given for m_{H^0}=125.5 GeV. See also CHATRCHYAN 13Y.

$b\bar{b}$ Final State

VALUE	DOCUMENT ID	TECN	COMMENT
0.82±0.30 OUR AVERAGE	Error includes scale factor of 1.1.		
$0.70^{+0.29}_{-0.27}$	[1,2] AAD 16AN	LHC	pp, 7, 8 TeV
$1.59^{+0.69}_{-0.72}$	[3] AALTONEN 13M	TEVA	$p\bar{p} \to H^0 X$, 1.96 TeV
• • • We do not use the following data for averages, fits, limits, etc. • • •			
$-0.8 \pm 1.3 ^{+1.8}_{-1.9}$	[4] AABOUD 16X	ATLS	$pp \to H^0 X$, VBF, 8 TeV
0.62±0.37	[2] AAD 16AN	ATLS	pp, 7, 8 TeV
$0.81^{+0.45}_{-0.43}$	[2] AAD 16AN	CMS	pp, 7, 8 TeV
$0.63^{+0.31}_{-0.30}{}^{+0.24}_{-0.23}$	[5] AAD 16K	ATLS	pp, 7, 8 TeV
0.52±0.32±0.24	[6] AAD 15G	ATLS	$pp \to H^0 W/Z X$, 7, 8 TeV
$2.8 ^{+1.6}_{-1.4}$	[7] KHACHATRY...15Z	CMS	$pp \to H^0 X$, VBF, 8 TeV
$1.03^{+0.44}_{-0.42}$	[8] KHACHATRY...15Z	CMS	pp, 8 TeV, combined
1.0 ±0.5	[9] CHATRCHYAN 14AI	CMS	$pp \to H^0 W/Z X$, 7, 8 TeV
$1.72^{+0.92}_{-0.87}$	[10] AALTONEN 13L	CDF	$p\bar{p} \to H^0 X$, 1.96 TeV
$1.23^{+1.24}_{-1.17}$	[11] ABAZOV 13L	D0	$p\bar{p} \to H^0 X$, 1.96 TeV
0.5 ±2.2	[12] AAD 12AI	ATLS	$pp \to H^0 W/Z X$, 7 TeV
	[13] AALTONEN 12T	TEVA	$p\bar{p} \to H^0 W/Z X$, 1.96 TeV
$0.48^{+0.81}_{-0.70}$	[14] CHATRCHYAN 12N	CMS	$pp \to H^0 W/Z X$, 7, 8 TeV

[1] AAD 16AN perform fits to the ATLAS and CMS data at E_{cm} = 7 and 8 TeV. The signal strengths for individual production processes are 1.0 ± 0.5 for WH^0 production, 0.4 ± 0.4 for ZH^0 production, and 1.1 ± 1.0 for $t\bar{t}H^0$ production.

[2] AAD 16AN: In the fit, relative production cross sections are fixed to those in the Standard Model. The quoted signal strength is given for m_{H^0} = 125.09 GeV.

[3] AALTONEN 13M combine all Tevatron data from the CDF and D0 Collaborations with up to 10.0 fb^{-1} and 9.7 fb^{-1}, respectively, of $p\bar{p}$ collisions at E_{cm} = 1.96 TeV. The quoted signal strength is given for m_{H^0} = 125 GeV.

[4] AABOUD 16X search for vector-boson fusion production of H^0 decaying to $b\overline{b}$ in 20.2 fb^{-1} of pp collisions at E_{cm} = 8 TeV. The quoted signal strength is given for m_{H^0} = 125 GeV.

[5] AAD 16K use up to 4.7 fb^{-1} of pp collisions at E_{cm} = 7 TeV and up to 20.3 fb^{-1} at E_{cm} = 8 TeV. The quoted signal strength is given for m_{H^0} = 125.36 GeV.

[6] AAD 15G use 4.7 fb^{-1} of pp collisions at E_{cm} = 7 TeV and 20.3 fb^{-1} at E_{cm} = 8 TeV. The quoted signal strength is given for m_{H^0} = 125.36 GeV.

[7] KHACHATRYAN 15Z search for vector-boson fusion production of H^0 decaying to $b\overline{b}$ in up to 19.8 fb^{-1} of pp collisions at E_{cm} = 8 TeV. The quoted signal strength is given for m_{H^0} = 125 GeV.

[8] KHACHATRYAN 15Z combined vector boson fusion, $W H^0$, $Z H^0$ production, and $t\overline{t}H^0$ production results. The quoted signal strength is given for m_{H^0} = 125 GeV.

[9] CHATRCHYAN 14AI use up to 5.1 fb^{-1} of pp collisions at E_{cm} = 7 TeV and up to 18.9 fb^{-1} at E_{cm} = 8 TeV. The quoted signal strength is given for m_{H^0} = 125 GeV. See also CHATRCHYAN 14AJ.

[10] AALTONEN 13L combine all CDF results with 9.45–10.0 fb^{-1} of $p\overline{p}$ collisions at E_{cm} = 1.96 TeV. The quoted signal strength is given for m_{H^0} = 125 GeV.

[11] ABAZOV 13L combine all D0 results with up to 9.7 fb^{-1} of $p\overline{p}$ collisions at E_{cm} = 1.96 TeV. The quoted signal strength is given for m_{H^0} = 125 GeV.

[12] AAD 12AI obtain results based on 4.6–4.8 fb^{-1} of pp collisions at E_{cm} = 7 TeV. The quoted signal strengths are given in their Fig. 10 for m_{H^0} = 126 GeV. See also Fig. 13 of AAD 12DA.

[13] AALTONEN 12T combine AALTONEN 12Q, AALTONEN 12R, AALTONEN 12S, ABAZOV 12O, ABAZOV 12P, and ABAZOV 12K. An excess of events over background is observed which is most significant in the region m_{H^0} = 120–135 GeV, with a local significance of up to 3.3 σ. The local significance at m_{H^0} = 125 GeV is 2.8 σ, which corresponds to $(\sigma(H^0 W) + \sigma(H^0 Z)) \cdot B(H^0 \rightarrow b\overline{b}) = (0.23^{+0.09}_{-0.08})$ pb, compared to the Standard Model expectation at m_{H^0} = 125 GeV of 0.12 ± 0.01 pb. Superseded by AALTONEN 13M.

[14] CHATRCHYAN 12N obtain results based on 5.0 fb^{-1} of pp collisions at E_{cm}=7 TeV and 5.1 fb^{-1} at E_{cm}=8 TeV. The quoted signal strength is given for m_{H^0}=125.5 GeV. See also CHATRCHYAN 13Y.

$\mu^+\mu^-$ Final State

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
0.1±2.5		[1] AAD	16AN	LHC	pp, 7, 8 TeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
−0.6±3.6		[1] AAD	16AN	ATLS	pp, 7, 8 TeV
$0.9^{+3.6}_{-3.5}$		[1] AAD	16AN	CMS	pp, 7, 8 TeV
< 7.4	95	[2] KHACHATRY...	15H	CMS	$pp \rightarrow H^0 X$, 7, 8 TeV
< 7.0	95	[3] AAD	14AS	ATLS	$pp \rightarrow H^0 X$, 7, 8 TeV

[1] AAD 16AN: In the fit, relative production cross sections are fixed to those in the Standard Model. The quoted signal strength is given for m_{H^0} = 125.09 GeV.

[2] KHACHATRYAN 15H use 5.0 fb^{-1} of pp collisions at E_{cm} = 7 TeV and 19.7 fb^{-1} at 8 TeV. The quoted signal strength is given for m_{H^0} = 125 GeV.

[3] AAD 14AS search for $H^0 \rightarrow \mu^+\mu^-$ in 4.5 fb^{-1} of pp collisions at E_{cm} = 7 TeV and 20.3 fb^{-1} at E_{cm} = 8 TeV. The quoted signal strength is given for m_{H^0} = 125.5 GeV.

$\tau^+\tau^-$ Final State

VALUE	DOCUMENT ID	TECN	COMMENT
1.12±0.23 OUR AVERAGE			
$1.11^{+0.24}_{-0.22}$	[1,2] AAD 16AN	LHC	pp, 7, 8 TeV
$1.68^{+2.28}_{-1.68}$	[3] AALTONEN 13M	TEVA	$p\overline{p} \rightarrow H^0 X$, 1.96 TeV
• • • We do not use the following data for averages, fits, limits, etc. • • •			
2.3 ± 1.6	[4] AAD 16AC	ATLS	$pp \rightarrow H^0 W/Z X$, 8 TeV
$1.41^{+0.40}_{-0.36}$	[2] AAD 16AN	ATLS	pp, 7, 8 TeV
$0.88^{+0.30}_{-0.28}$	[2] AAD 16AN	CMS	pp, 7, 8 TeV
$1.44^{+0.30}_{-0.29}{}^{+0.29}_{-0.23}$	[5] AAD 16K	ATLS	pp, 7, 8 TeV
$1.43^{+0.27}_{-0.26}{}^{+0.32}_{-0.25} \pm 0.09$	[6] AAD 15AH	ATLS	$pp \rightarrow H^0 X$, 7, 8 TeV
0.78 ± 0.27	[7] CHATRCHYAN 14K	CMS	$pp \rightarrow H^0 X$, 7, 8 TeV
$0.00^{+8.44}_{-0.00}$	[8] AALTONEN 13L	CDF	$p\overline{p} \rightarrow H^0 X$, 1.96 TeV
$3.96^{+4.11}_{-3.38}$	[9] ABAZOV 13L	D0	$p\overline{p} \rightarrow H^0 X$, 1.96 TeV
$0.4 \ {}^{+1.6}_{-2.0}$	[10] AAD 12AI	ATLS	$pp \rightarrow H^0 X$, 7 TeV
$0.09^{+0.76}_{-0.74}$	[11] CHATRCHYAN 12N	CMS	$pp \rightarrow H^0 X$, 7, 8 TeV

[1] AAD 16AN perform fits to the ATLAS and CMS data at E_{cm} = 7 and 8 TeV. The signal strengths for individual production processes are 1.0 ± 0.6 for gluon fusion, 1.3 ± 0.4 for vector boson fusion, -1.4 ± 1.4 for $W H^0$ production, $2.2^{+2.2}_{-1.8}$ for $Z H^0$ production, and $-1.9^{+3.7}_{-3.3}$ for $t\overline{t} H^0$ production.

[2] AAD 16AN: In the fit, relative production cross sections are fixed to those in the Standard Model. The quoted signal strength is given for m_{H^0} = 125.09 GeV.

[3] AALTONEN 13M combine all Tevatron data from the CDF and D0 Collaborations with up to 10.0 fb^{-1} and 9.7 fb^{-1}, respectively, of $p\overline{p}$ collisions at E_{cm} = 1.96 TeV. The quoted signal strength is given for m_{H^0} = 125 GeV.

[4] AAD 16AC measure the signal strength with $pp \rightarrow H^0 W/Z X$ processes using 20.3 fb^{-1} of E_{cm} = 8 TeV. The quoted signal strength is given for m_{H^0} = 125 GeV.

[5] AAD 16K use up to 4.7 fb^{-1} of pp collisions at E_{cm} = 7 TeV and up to 20.3 fb^{-1} at E_{cm} = 8 TeV. The quoted signal strength is given for m_{H^0} = 125.36 GeV.

[6] AAD 15AH use 4.5 fb^{-1} of pp collisions at E_{cm} = 7 TeV and 20.3 fb^{-1} at E_{cm} = 8 TeV. The third uncertainty in the measurement is theory systematics. The signal strength for the gluon fusion mode is $2.0 \pm 0.8^{+1.2}_{-0.8} \pm 0.3$ and that for vector boson fusion and $W/Z H^0$ production modes is $1.24^{+0.49}_{-0.45}{}^{+0.31}_{-0.29} \pm 0.08$. The quoted signal strength is given for m_{H^0} = 125.36 GeV.

[7] CHATRCHYAN 14K use 4.9 fb^{-1} of pp collisions at E_{cm} = 7 TeV and 19.7 fb^{-1} at E_{cm} = 8 TeV. The quoted signal strength is given for m_{H^0} = 125 GeV. See also CHATRCHYAN 14AJ.

[8] AALTONEN 13L combine all CDF results with 9.45–10.0 fb^{-1} of $p\overline{p}$ collisions at E_{cm} = 1.96 TeV. The quoted signal strength is given for m_{H^0} = 125 GeV.

[9] ABAZOV 13L combine all D0 results with up to 9.7 fb^{-1} of $p\overline{p}$ collisions at E_{cm} = 1.96 TeV. The quoted signal strength is given for m_{H^0} = 125 GeV.

[10] AAD 12AI obtain results based on 4.7 fb^{-1} of pp collisions at E_{cm} = 7 TeV. The quoted signal strengths are given in their Fig. 10 for m_{H^0} = 126 GeV. See also Fig. 13 of AAD 12DA.

[11] CHATRCHYAN 12N obtain results based on 4.9 fb^{-1} of pp collisions at E_{cm}=7 TeV and 5.1 fb^{-1} at E_{cm}=8 TeV. The quoted signal strength is given for m_{H^0}=125.5 GeV. See also CHATRCHYAN 13Y .

$Z\gamma$ Final State

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<11	95	[1] AAD	14J	ATLS	$pp \to H^0 X$, 7, 8 TeV
< 9.5	95	[2] CHATRCHYAN	13BK	CMS	$pp \to H^0 X$, 7, 8 TeV

[1] AAD 14J search for $H^0 \to Z\gamma \to \ell\ell\gamma$ in 4.5 fb^{-1} of pp collisions at E_{cm} = 7 TeV and 20.3 fb^{-1} at E_{cm} = 8 TeV. The quoted signal strength is given for m_{H^0} = 125.5 GeV.

[2] CHATRCHYAN 13BK search for $H^0 \to Z\gamma \to \ell\ell\gamma$ in 5.0 fb^{-1} of pp collisions at E_{cm} = 7 TeV and 19.6 fb^{-1} at E_{cm} = 8 TeV. A limit on cross section times branching ratio which corresponds to (4–25) times the expected Standard Model cross section is given in the range m_{H^0} = 120–160 GeV at 95% CL. The quoted limit is given for m_{H^0} = 125 GeV, where 10 is expected for no signal.

$t\bar{t}H^0$ Production

Signal strengh relative to the Standard Model cross section.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$\mathbf{2.3^{+0.7}_{-0.6}}$		[1,2] AAD	16AN	LHC	pp, 7, 8 TeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
1.7 ± 0.8		[3] AAD	16AL	ATLS	$pp \to H^0 t\bar{t} X$, 7, 8 TeV
$1.9^{+0.8}_{-0.7}$		[2] AAD	16AN	ATLS	pp, 7, 8 TeV
$2.9^{+1.0}_{-0.9}$		[2] AAD	16AN	CMS	pp, 7, 8 TeV
$1.81^{+0.52}_{-0.50}{}^{+0.58}_{-0.55}{}^{+0.31}_{-0.12}$		[4] AAD	16K	ATLS	pp, 7, 8 TeV
$1.4^{+2.1}_{-1.4}{}^{+0.6}_{-0.3}$		[5] AAD	15	ATLS	pp, 7, 8 TeV
1.5 ± 1.1		[6] AAD	15BC	ATLS	pp, 8 TeV
$2.1^{+1.4}_{-1.2}$		[7] AAD	15T	ATLS	pp, 8 TeV
$1.2^{+1.6}_{-1.5}$		[8] KHACHATRY...	15AN	CMS	pp, 8 TeV
$2.8^{+1.0}_{-0.9}$		[9] KHACHATRY...	14H	CMS	pp, 7, 8 TeV
$9.49^{+6.60}_{-6.28}$		[10] AALTONEN	13L	CDF	$p\bar{p}$, 1.96 TeV
<5.8	95	[11] CHATRCHYAN	13X	CMS	$pp \to H^0 t\bar{t} X$

[1] AAD 16AN perform fits to the ATLAS and CMS data at E_{cm} = 7 and 8 TeV.

[2] AAD 16AN: In the fit, relative branching ratios are fixed to those in the Standard Model. The quoted signal strength is given for m_{H^0} = 125.09 GeV.

[3] AAD 16AL search for $t\overline{t}H^0$ production with H^0 decaying to $\gamma\gamma$ in 4.5 fb^{-1} of pp collisions at E_{cm} = 7 TeV and $b\overline{b}$, $\tau\tau$, $\gamma\gamma$, WW^*, and ZZ^* in 20.3 fb^{-1} at E_{cm} = 8 TeV. The quoted signal strength is given for m_{H^0} = 125 GeV. This paper combines the results of previous papers, and the new result of this paper only is: $\mu = 1.6 \pm 2.6$.

[4] AAD 16K use up to 4.7 fb^{-1} of pp collisions at E_{cm} = 7 TeV and up to 20.3 fb^{-1} at E_{cm} = 8 TeV. The third uncertainty in the measurement is theory systematics. The quoted signal strength is given for m_{H^0} = 125.36 GeV.

[5] AAD 15 search for $t\overline{t}H^0$ production with H^0 decaying to $\gamma\gamma$ in 4.5 fb^{-1} of pp collisions at E_{cm} = 7 TeV and 20.3 fb^{-1} at E_{cm} = 8 TeV. The quoted result on the signal strength is equivalent to an upper limit of 6.7 at 95% CL and is given for m_{H^0} = 125.4 GeV.

[6] AAD 15BC search for $t\overline{t}H^0$ production with H^0 decaying to $b\overline{b}$ in 20.3 fb^{-1} of pp collisions at E_{cm} = 8 TeV. The corresponding upper limit is 3.4 at 95% CL. The quoted signal strength is given for m_{H^0} = 125 GeV.

[7] AAD 15T search for $t\overline{t}H^0$ production with H^0 resulting in multilepton final states (mainly from WW^*, $\tau\tau$, ZZ^*) in 20.3 fb^{-1} of pp collisions at E_{cm} = 8 TeV. The quoted result on the signal strength is given for m_{H^0} = 125 GeV and corresponds to an upper limit of 4.7 at 95% CL. The data sample is independent from AAD 15 and AAD 15BC.

[8] KHACHATRYAN 15AN search for $t\overline{t}H^0$ production with H^0 decaying to $b\overline{b}$ in 19.5 fb^{-1} of pp collisions at E_{cm} = 8 TeV. The quoted result on the signal strength is equivalent to an upper limit of 4.2 at 95% CL and is given for m_{H^0} = 125 GeV.

[9] KHACHATRYAN 14H search for $t\overline{t}H^0$ production with H^0 decaying to $b\overline{b}$, $\tau\tau$, $\gamma\gamma$, WW^*, and ZZ^*, in 5.1 fb^{-1} of pp collisions at E_{cm} = 7 TeV and 19.7 fb^{-1} at E_{cm} = 8 TeV. The quoted signal strength is given for m_{H^0} = 125.6 GeV.

[10] AALTONEN 13L combine all CDF results with 9.45–10.0 fb^{-1} of $p\overline{p}$ collisions at E_{cm} = 1.96 TeV. The quoted signal strength is given for m_{H^0} = 125 GeV.

[11] CHATRCHYAN 13X search for $t\overline{t}H^0$ production followed by $H^0 \rightarrow b\overline{b}$, one top decaying to $\ell\nu$ and the other to either $\ell\nu$ or $q\overline{q}$ in 5.0 fb^{-1} and 5.1 fb^{-1} of pp collisions at E_{cm} = 7 and 8 TeV. A limit on cross section times branching ratio which corresponds to (4.0–8.6) times the expected Standard Model cross section is given for m_{H^0} = 110–140 GeV at 95% CL. The quoted limit is given for m_{H^0} = 125 GeV, where 5.2 is expected for no signal.

H^0H^0 Production

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<74	95	[1] KHACHATRY...16BQ	CMS	pp, 8 TeV, $\gamma\gamma b\overline{b}$

[1] KHACHATRYAN 16BQ search for H^0H^0 production using $H^0H^0 \rightarrow \gamma\gamma b\overline{b}$ with data of 19.7 fb^{-1} at E_{cm} = 8 TeV. The upper limit on the $gg \rightarrow H^0H^0 \rightarrow \gamma\gamma b\overline{b}$ production is measured to be 1.85 fb, which corresponds to 0.71 pb for $gg \rightarrow H^0H^0$ production cross section. The limit < 74 is for the scaling factor relative to the SM prediction. Limits on Higgs-boson trilinear coupling λ are also given.

tH^0 associated production cross section

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
	95	[1] KHACHATRY...16AU	CMS	pp, 8 TeV

[1] KHACHATRYAN 16AU search for the tH^0 associated production in 19.7 fb^{-1} at E_{cm} = 8 TeV. The 95% CL upper limits on the tH^0 associated production cross section is measured to be 600–1000 fb depending on the assumed $\gamma\gamma$ branching ratios of the Higgs boson. The $\gamma\gamma$ branching ratio is varied to be by a factor of 0.5–3.0 of the Standard Model Higgs boson (m_{H^0} = 125 GeV). The results of the signal strengths for a negative Higgs-boson trilinear coupling are given. The results are given for m_{H^0} = 125 GeV.

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AAD	16	PL B753 69	G. Aad *et al.*	(ATLAS Collab.)
AAD	16AC	PR D93 092005	G. Aad *et al.*	(ATLAS Collab.)
AAD	16AF	JHEP 1601 172	G. Aad *et al.*	(ATLAS Collab.)
AAD	16AL	JHEP 1605 160	G. Aad *et al.*	(ATLAS Collab.)
AAD	16AN	JHEP 1608 045	G. Aad *et al.*	(ATLAS and CMS Collabs.)
AAD	16AO	JHEP 1608 104	G. Aad *et al.*	(ATLAS Collab.)
AAD	16BL	EPJ C76 658	G. Aad *et al.*	(ATLAS Collab.)
AAD	16K	EPJ C76 6	G. Aad *et al.*	(ATLAS Collab.)
KHACHATRY...	16AB	PL B759 672	V. Khachatryan *et al.*	(CMS Collab.)
KHACHATRY...	16AR	JHEP 1604 005	V. Khachatryan *et al.*	(CMS Collab.)
KHACHATRY...	16AU	JHEP 1606 177	V. Khachatryan *et al.*	(CMS Collab.)
KHACHATRY...	16B	PL B753 341	V. Khachatryan *et al.*	(CMS Collab.)
KHACHATRY...	16BA	JHEP 1609 051	V. Khachatryan *et al.*	(CMS Collab.)
KHACHATRY...	16BQ	PR D94 052012	V. Khachatryan *et al.*	(CMS Collab.)
KHACHATRY...	16CD	PL B763 472	V. Khachatryan *et al.*	(CMS Collab.)
KHACHATRY...	16G	EPJ C76 13	V. Khachatryan *et al.*	(CMS Collab.)
AAD	15	PL B740 222	G. Aad *et al.*	(ATLAS Collab.)
AAD	15AA	PR D92 012006	G. Aad *et al.*	(ATLAS Collab.)
AAD	15AH	JHEP 1504 117	G. Aad *et al.*	(ATLAS Collab.)
AAD	15AQ	JHEP 1508 137	G. Aad *et al.*	(ATLAS Collab.)
AAD	15AX	EPJ C75 231	G. Aad *et al.*	(ATLAS Collab.)
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AAD	15BC	EPJ C75 349	G. Aad *et al.*	(ATLAS Collab.)
AAD	15BD	EPJ C75 337	G. Aad *et al.*	(ATLAS Collab.)
AAD	15BE	EPJ C75 335	G. Aad *et al.*	(ATLAS Collab.)
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Also		EPJ C76 152 (errat.)	G. Aad *et al.*	(ATLAS Collab.)
AAD	15F	PR D91 012006	G. Aad *et al.*	(ATLAS Collab.)
AAD	15G	JHEP 1501 069	G. Aad *et al.*	(ATLAS Collab.)
AAD	15I	PRL 114 121801	G. Aad *et al.*	(ATLAS Collab.)
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AAD	15T	PL B749 519	G. Aad *et al.*	(ATLAS Collab.)
AALTONEN	15	PRL 114 151802	T. Aaltonen *et al.*	(CDF and D0 Collabs.)
AALTONEN	15B	PRL 114 141802	T. Aaltonen *et al.*	(CDF Collab.)
KHACHATRY...	15AM	EPJ C75 212	V. Khachatryan *et al.*	(CMS Collab.)
KHACHATRY...	15AN	EPJ C75 251	V. Khachatryan *et al.*	(CMS Collab.)
KHACHATRY...	15BA	PR D92 072010	V. Khachatryan *et al.*	(CMS Collab.)
KHACHATRY...	15H	PL B744 184	V. Khachatryan *et al.*	(CMS Collab.)
KHACHATRY...	15Q	PL B749 337	V. Khachatryan *et al.*	(CMS Collab.)
KHACHATRY...	15Y	PR D92 012004	V. Khachatryan *et al.*	(CMS Collab.)
KHACHATRY...	15Z	PR D92 032008	V. Khachatryan *et al.*	(CMS Collab.)
AAD	14AR	PL B738 234	G. Aad *et al.*	(ATLAS Collab.)
AAD	14AS	PL B738 68	G. Aad *et al.*	(ATLAS Collab.)
AAD	14BC	PR D90 112015	G. Aad *et al.*	(ATLAS Collab.)
AAD	14BJ	JHEP 1409 112	G. Aad *et al.*	(ATLAS Collab.)
AAD	14J	PL B732 8	G. Aad *et al.*	(ATLAS Collab.)
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AAD	14W	PR D90 052004	G. Aad *et al.*	(ATLAS Collab.)
ABAZOV	14F	PRL 113 161802	V.M. Abazov *et al.*	(D0 Collab.)
CHATRCHYAN	14AA	PR D89 092007	S. Chatrchyan *et al.*	(CMS Collab.)
CHATRCHYAN	14AI	PR D89 012003	S. Chatrchyan *et al.*	(CMS Collab.)
CHATRCHYAN	14AJ	NATP 10 557	S. Chatrchyan *et al.*	(CMS Collab.)
CHATRCHYAN	14B	EPJ C74 2980	S. Chatrchyan *et al.*	(CMS Collab.)
CHATRCHYAN	14G	JHEP 1401 096	S. Chatrchyan *et al.*	(CMS Collab.)
CHATRCHYAN	14K	JHEP 1405 104	S. Chatrchyan *et al.*	(CMS Collab.)
KHACHATRY...	14D	PL B736 64	V. Khachatryan *et al.*	(CMS Collab.)

KHACHATRY...	14H	JHEP 1409 087	V. Khachartryan *et al.*	(CMS Collab.)
KHACHATRY...	14P	EPJ C74 3076	V. Khachatryan *et al.*	(CMS Collab.)
AAD	13AJ	PL B726 120	G. Aad *et al.*	(ATLAS Collab.)
AAD	13AK	PL B726 88	G. Aad *et al.*	(ATLAS Collab.)
Also		PL B734 406 (errat.)	G. Aad *et al.*	(ATLAS Collab.)
AALTONEN	13L	PR D88 052013	T. Aaltonen *et al.*	(CDF Collab.)
AALTONEN	13M	PR D88 052014	T. Aaltonen *et al.*	(CDF and D0 Collabs.)
ABAZOV	13L	PR D88 052011	V.M. Abazov *et al.*	(D0 Collab.)
CHATRCHYAN	13BK	PL B726 587	S. Chatrchyan *et al.*	(CMS Collab.)
CHATRCHYAN	13J	PRL 110 081803	S. Chatrchyan *et al.*	(CMS Collab.)
CHATRCHYAN	13X	JHEP 1305 145	S. Chatrchyan *et al.*	(CMS Collab.)
CHATRCHYAN	13Y	JHEP 1306 081	S. Chatrchyan *et al.*	(CMS Collab.)
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AAD	12AI	PL B716 1	G. Aad *et al.*	(ATLAS Collab.)
AAD	12DA	SCI 338 1576	G. Aad *et al.*	(ATLAS Collab.)
AALTONEN	12Q	PRL 109 111803	T. Aaltonen *et al.*	(CDF Collab.)
AALTONEN	12R	PRL 109 111804	T. Aaltonen *et al.*	(CDF Collab.)
AALTONEN	12S	PRL 109 111805	T. Aaltonen *et al.*	(CDF Collab.)
AALTONEN	12T	PRL 109 071804	T. Aaltonen *et al.*	(CDF and D0 Collabs.)
ABAZOV	12K	PL B716 285	V.M. Abazov *et al.*	(D0 Collab.)
ABAZOV	12O	PRL 109 121803	V.M. Abazov *et al.*	(D0 Collab.)
ABAZOV	12P	PRL 109 121804	V.M. Abazov *et al.*	(D0 Collab.)
CHATRCHYAN	12BY	SCI 338 1569	S. Chatrchyan *et al.*	(CMS Collab.)
CHATRCHYAN	12N	PL B716 30	S. Chatrchyan *et al.*	(CMS Collab.)
DITTMAIER	12	arXiv:1201.3084	S. Dittmaier *et al.*	(LHC Higgs CS Working Group)
DITTMAIER	11	arXiv:1101.0593	S. Dittmaier *et al.*	(LHC Higgs CS Working Group)