



EFT Interpretation – Status

MPP Higgs + BSM Meeting

Verena Walbrecht

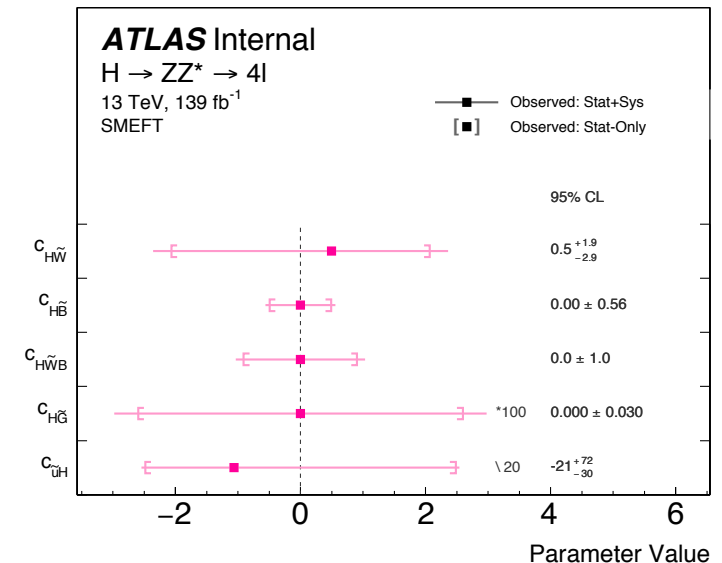
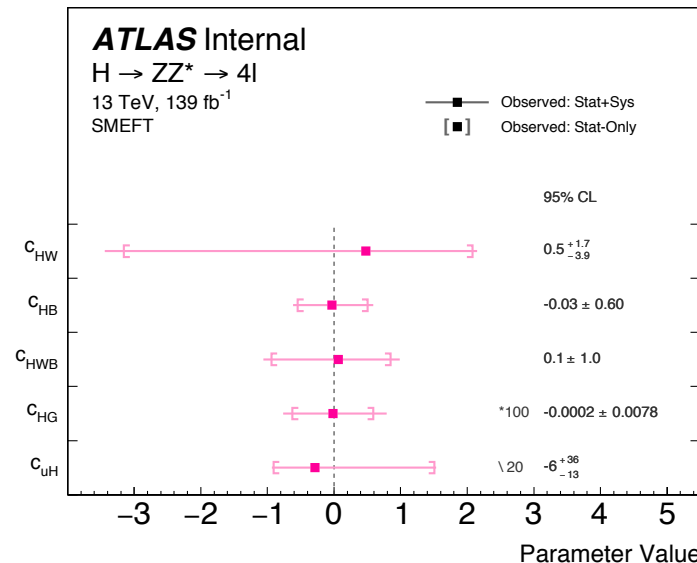
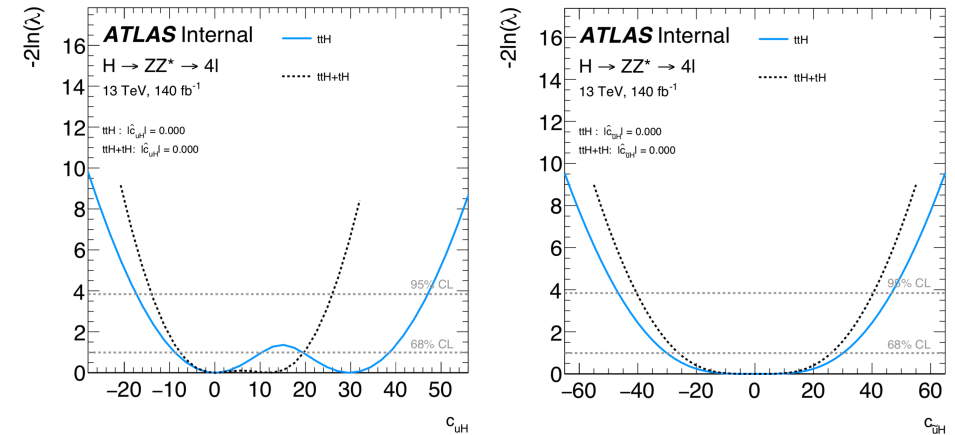
Max Planck Institute for Physics
(Werner-Heisenberg-Institut)

Monday 18th November, 2019

Status



- Unblinding for about 2.5 weeks
- One change before unblinding: add tH to the parametrisation
- Paper editor: Sandra, Haider & Verena
- EB meeting: next Thursday (12:30)
 - We have to present the paper structure
- To do:
 - Answer all CDS comments
 - Finalise note



BACKUP

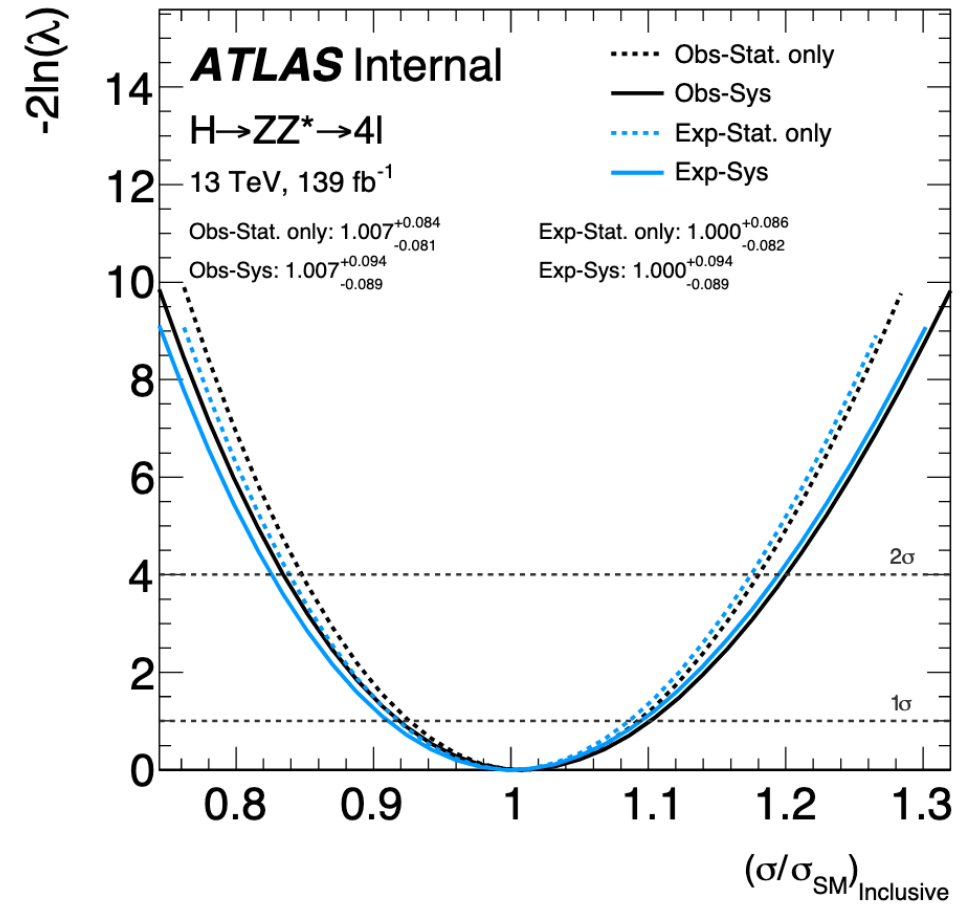
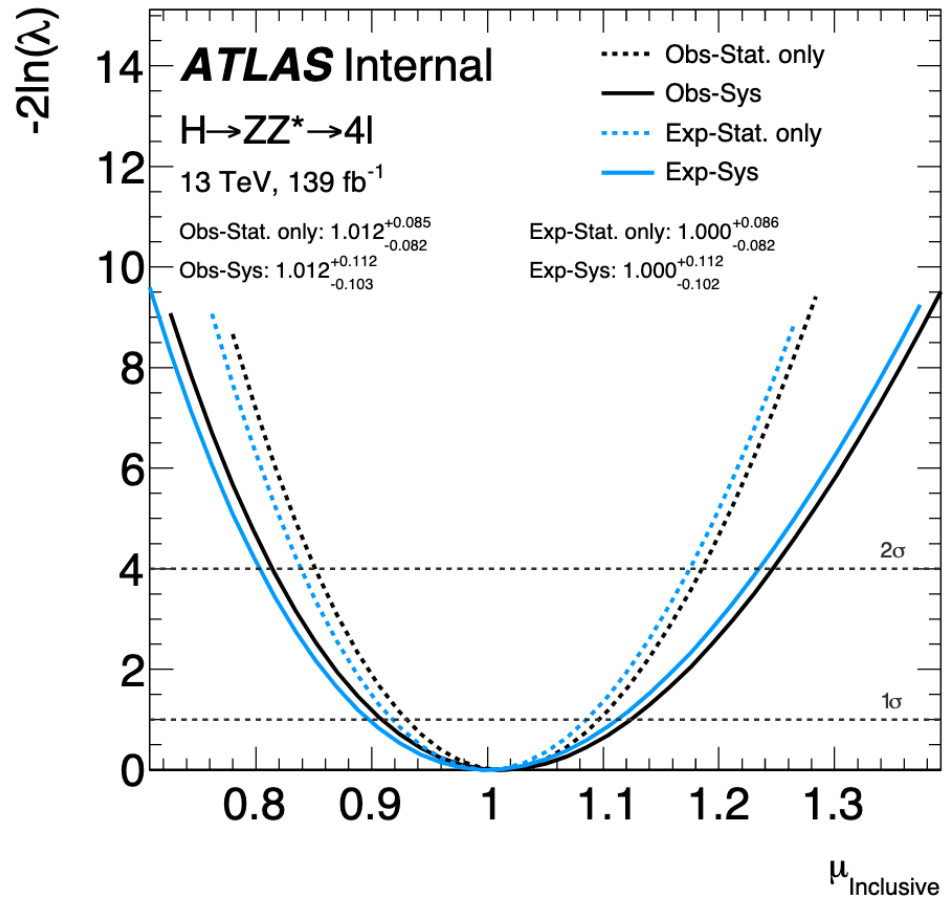
STXS Results



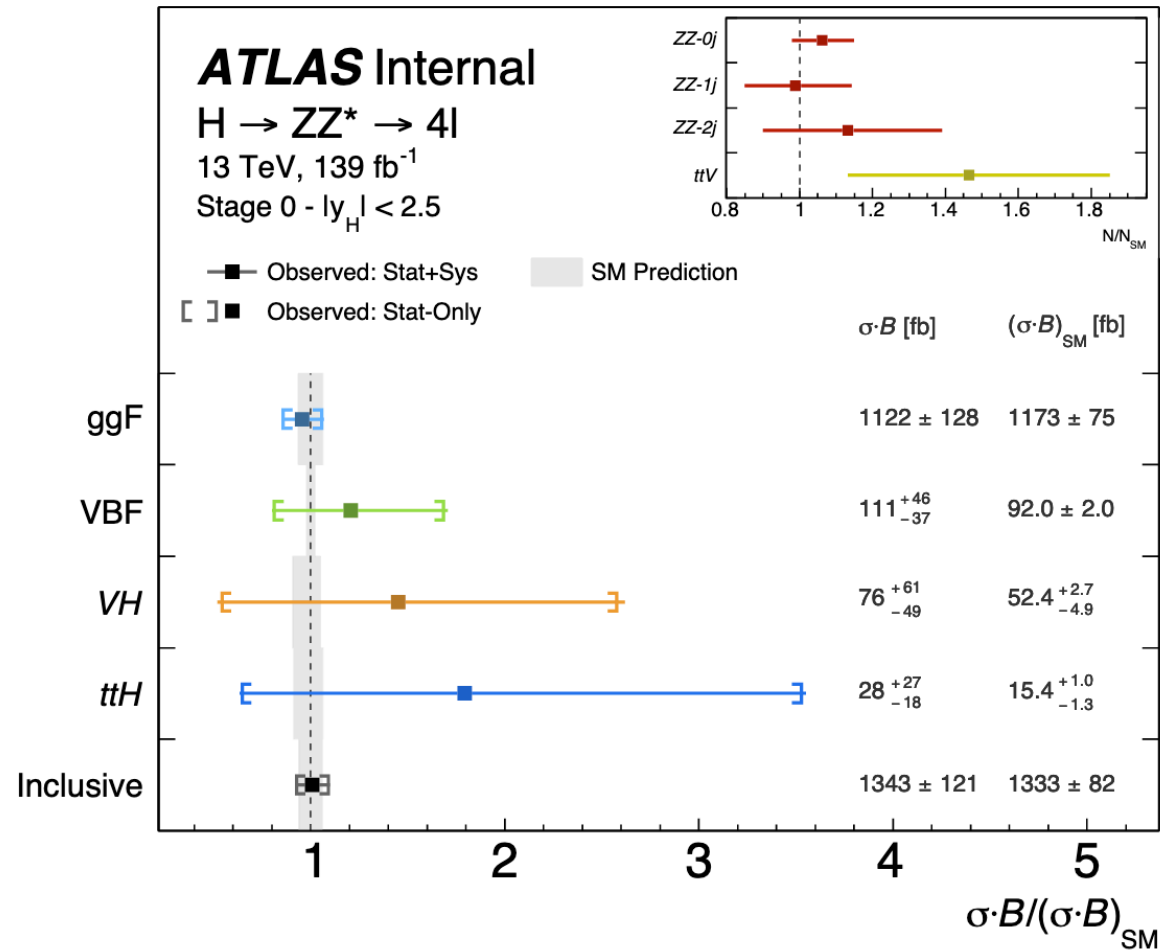
- Total yield is 310 (previously 316)
 - Table comparison in backup
- New ttH-Hadronic candidate!
- Particle flow caused some migrations in categories

Reconstructed event category	Signal	ZZ background	tXX background	Other backgrounds	Total expected	Observed
Signal $115 < m_{4\ell} < 130$ GeV						
$0j\text{-}p_T^{4\ell}\text{-Low}$	24.2 ± 3.5	30 ± 4	—	0.75 ± 0.10	55 ± 5	56
$0j\text{-}p_T^{4\ell}\text{-Med}$	76 ± 8	37 ± 4	0.039 ± 0.007	4.8 ± 0.4	118 ± 9	117
$0j\text{-}p_T^{4\ell}\text{-High}$	0.355 ± 0.031	0.020 ± 0.012	0.0094 ± 0.0027	0.187 ± 0.029	0.58 ± 0.04	1
$1j\text{-}p_T^{4\ell}\text{-Low}$	34 ± 4	15.5 ± 2.7	0.082 ± 0.009	1.42 ± 0.20	51 ± 5	41
$1j\text{-}p_T^{4\ell}\text{-Med}$	20.8 ± 2.8	4.0 ± 0.7	0.114 ± 0.013	0.73 ± 0.12	25.7 ± 2.9	31
$1j\text{-}p_T^{4\ell}\text{-High}$	4.7 ± 0.8	0.48 ± 0.10	0.043 ± 0.008	0.178 ± 0.027	5.4 ± 0.8	4
$1j\text{-}p_T^{4\ell}\text{-BSM-Like}$	1.23 ± 0.23	0.069 ± 0.031	0.0067 ± 0.0031	0.036 ± 0.007	1.35 ± 0.23	2
$2j$	38 ± 5	9.1 ± 2.7	0.95 ± 0.08	1.56 ± 0.21	50 ± 6	48
$2j\text{-BSM-like}$	3.3 ± 0.6	0.18 ± 0.06	0.032 ± 0.005	0.052 ± 0.010	3.6 ± 0.6	6
$VH\text{-Lep-enriched}$	1.29 ± 0.07	0.156 ± 0.025	0.039 ± 0.009	0.0025 ± 0.0018	1.50 ± 0.08	1
$ttH\text{-Had-enriched}$	1.02 ± 0.18	0.058 ± 0.025	0.252 ± 0.032	0.093 ± 0.031	1.42 ± 0.18	2
$ttH\text{-Lep-enriched}$	0.42 ± 0.04	0.002 ± 0.005	0.0157 ± 0.0023	—	0.44 ± 0.04	1
Sideband $105 < m_{4\ell} < 115$ GeV or $130 < m_{4\ell} < 160$ GeV						
SB- $0j$	4.5 ± 0.5	150 ± 13	0.22 ± 0.04	12.0 ± 1.5	167 ± 13	183
SB- $1j$	2.80 ± 0.30	51 ± 7	1.29 ± 0.16	6.1 ± 0.8	61 ± 7	64
SB- $2j$	2.02 ± 0.27	25 ± 7	4.4 ± 0.5	4.3 ± 0.6	36 ± 7	41
SB- $VH\text{-Lep-enriched}$	0.273 ± 0.015	0.48 ± 0.06	0.125 ± 0.018	0.019 ± 0.015	1.00 ± 0.07	3
$105 < m_{4\ell} < 115$ GeV or $130 < m_{4\ell} < 350$ GeV						
SB- $ttV\text{-enriched}$	0.071 ± 0.012	0.32 ± 0.12	12.1 ± 1.3	0.64 ± 0.31	13.2 ± 1.4	19

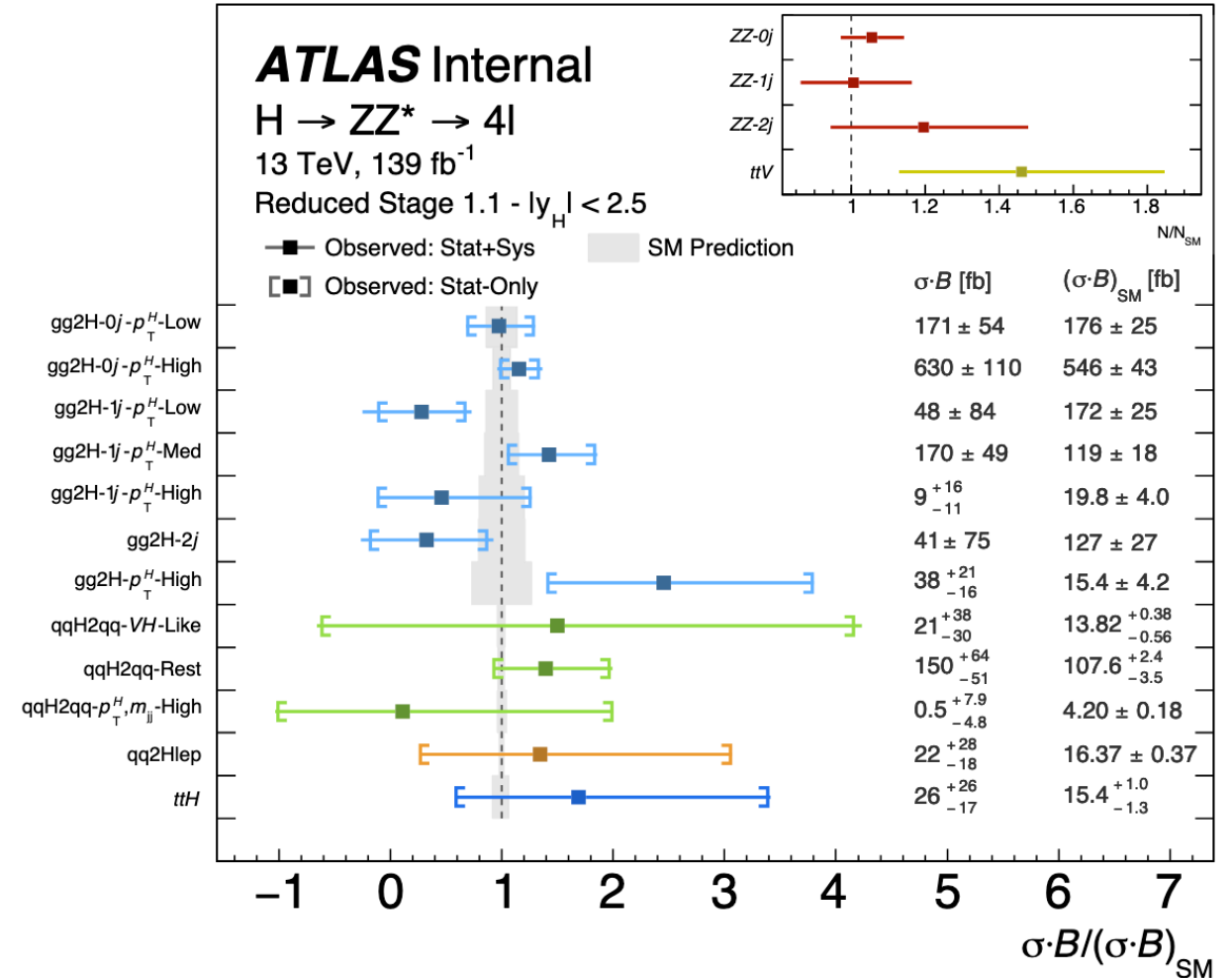
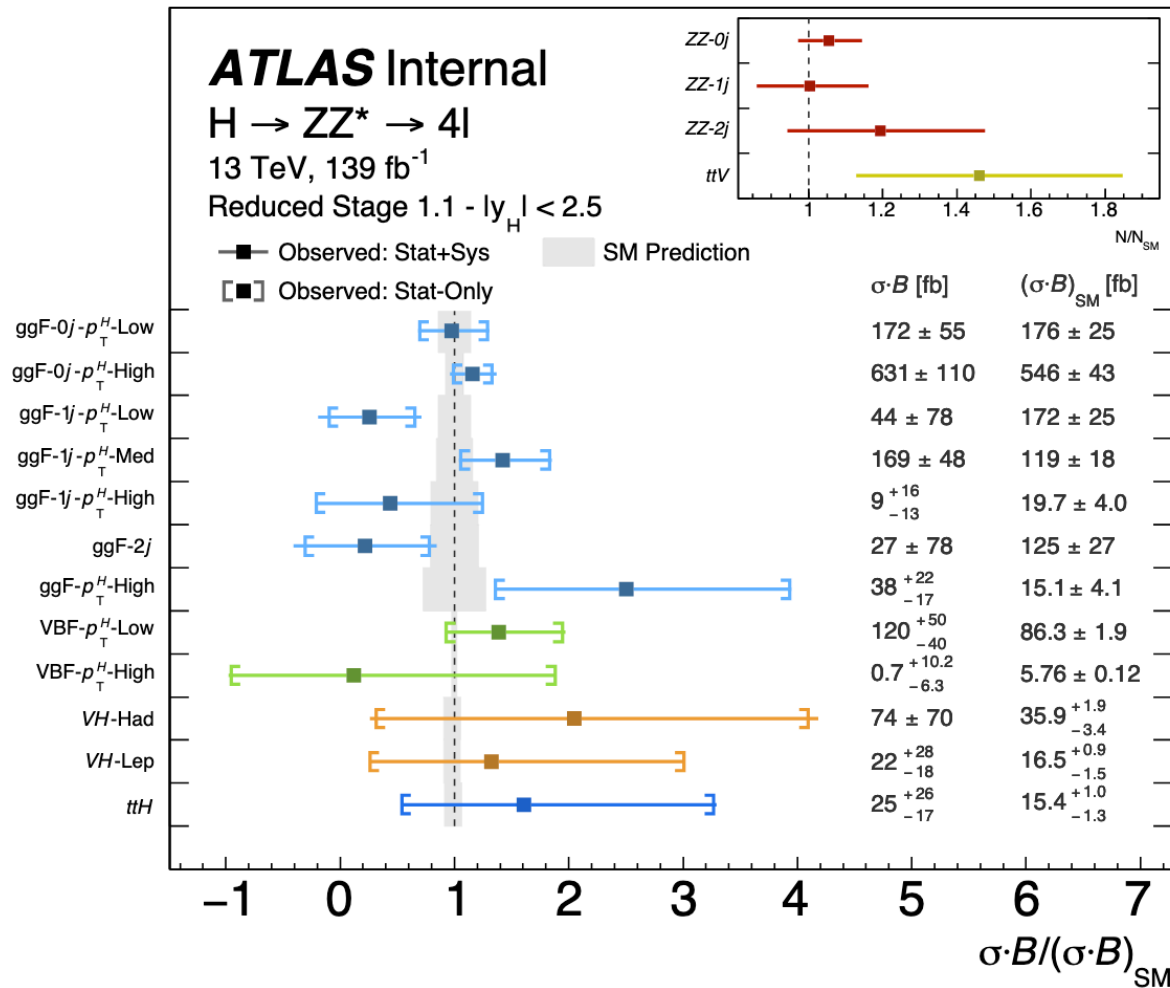
STXS Results



STXS Results



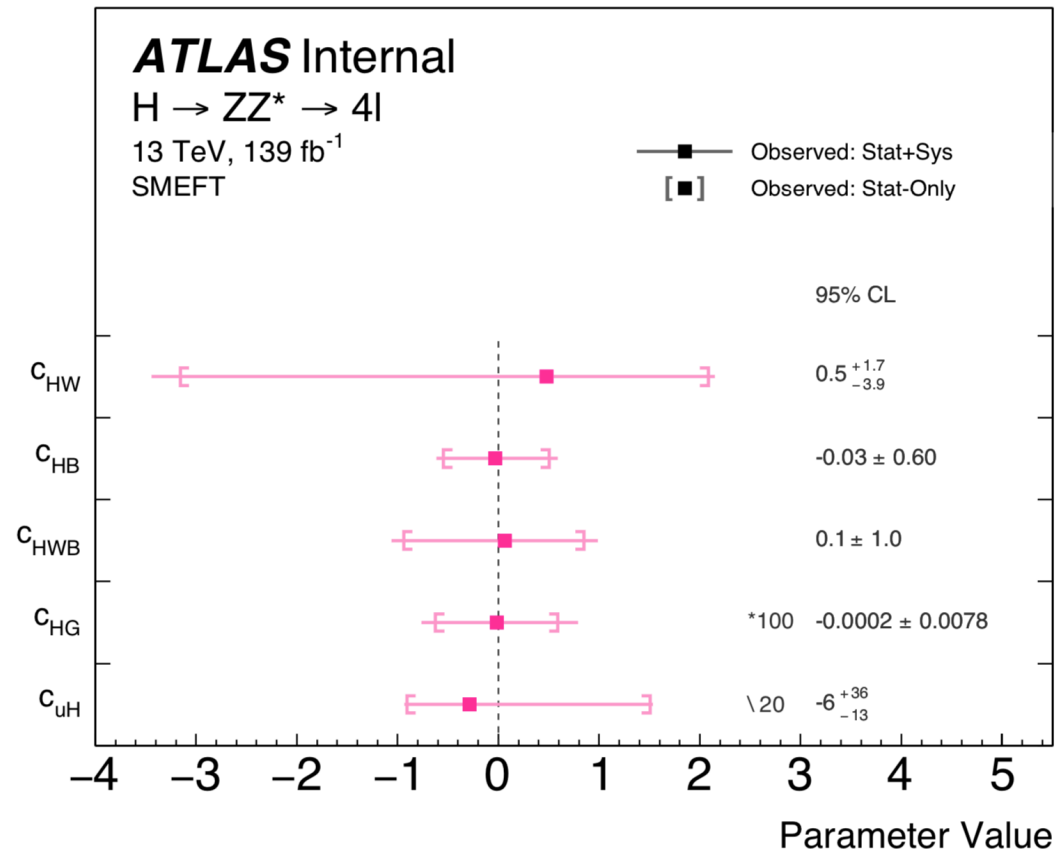
STXS Results



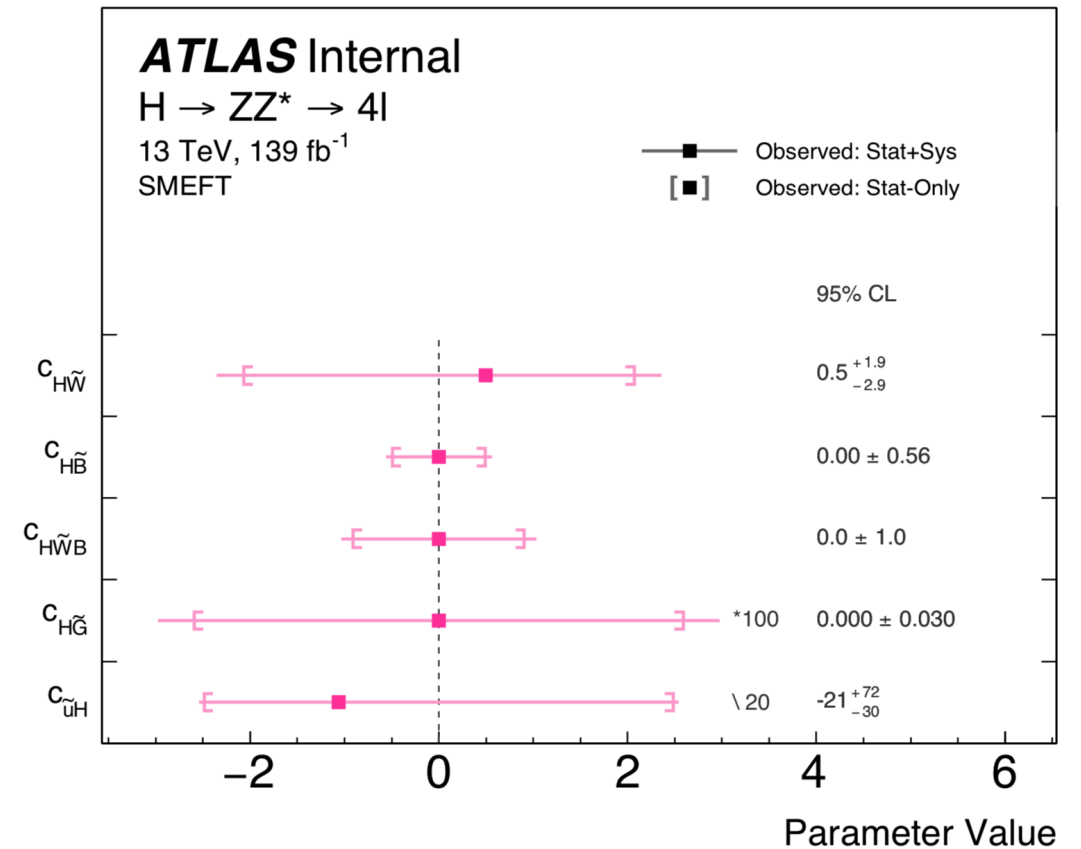
Results EFT Interpretation



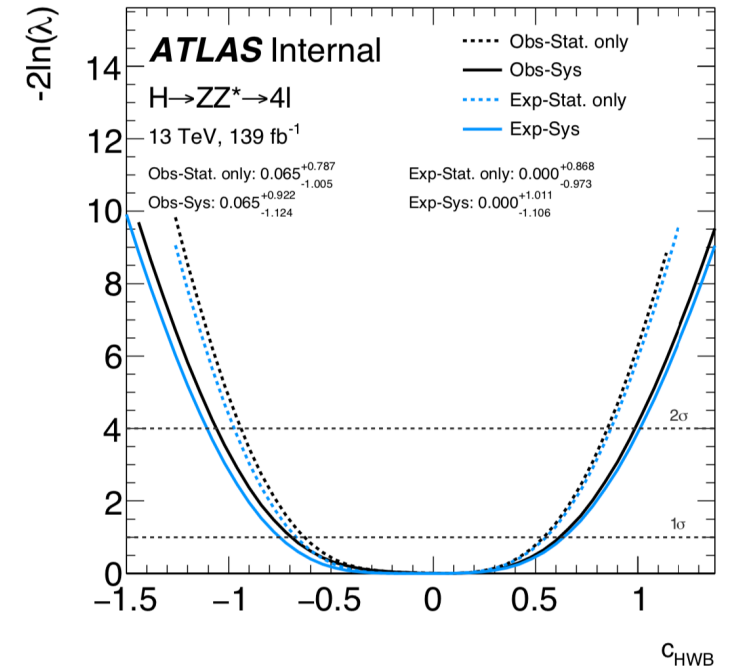
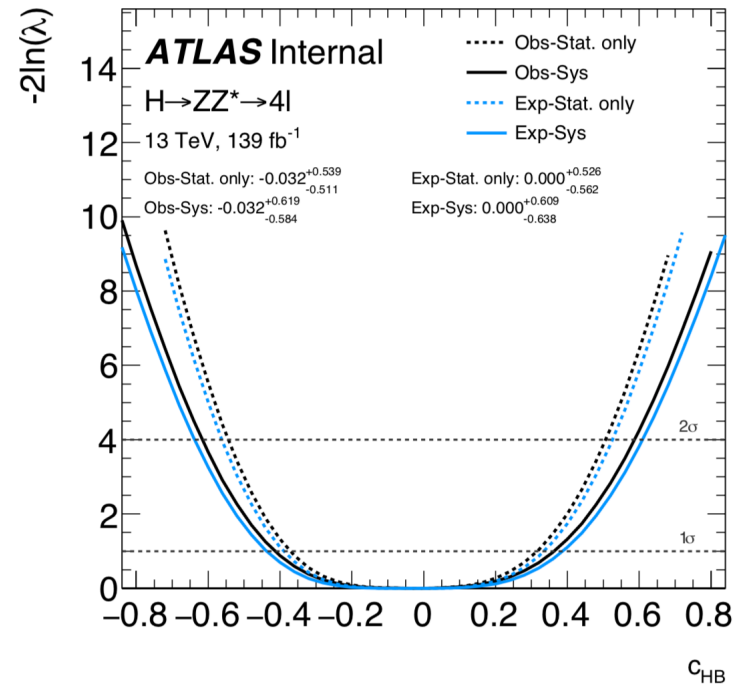
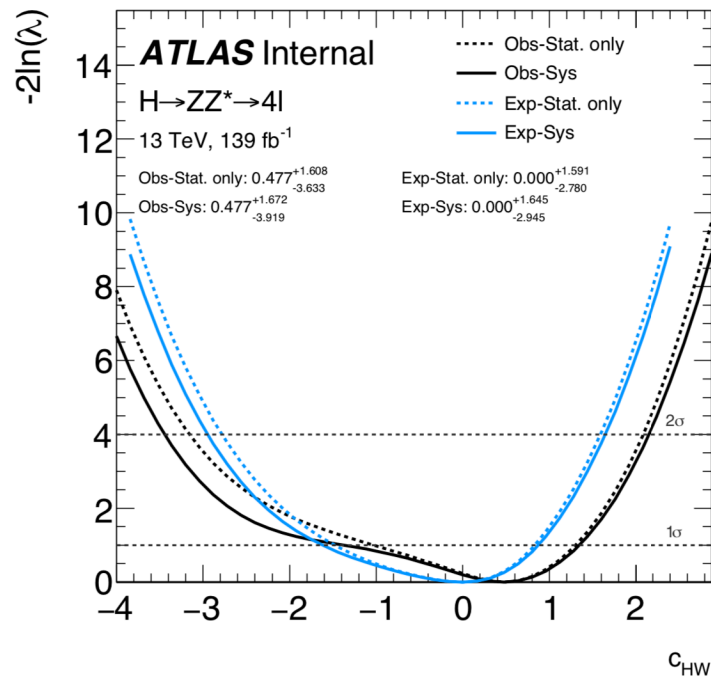
CP-even



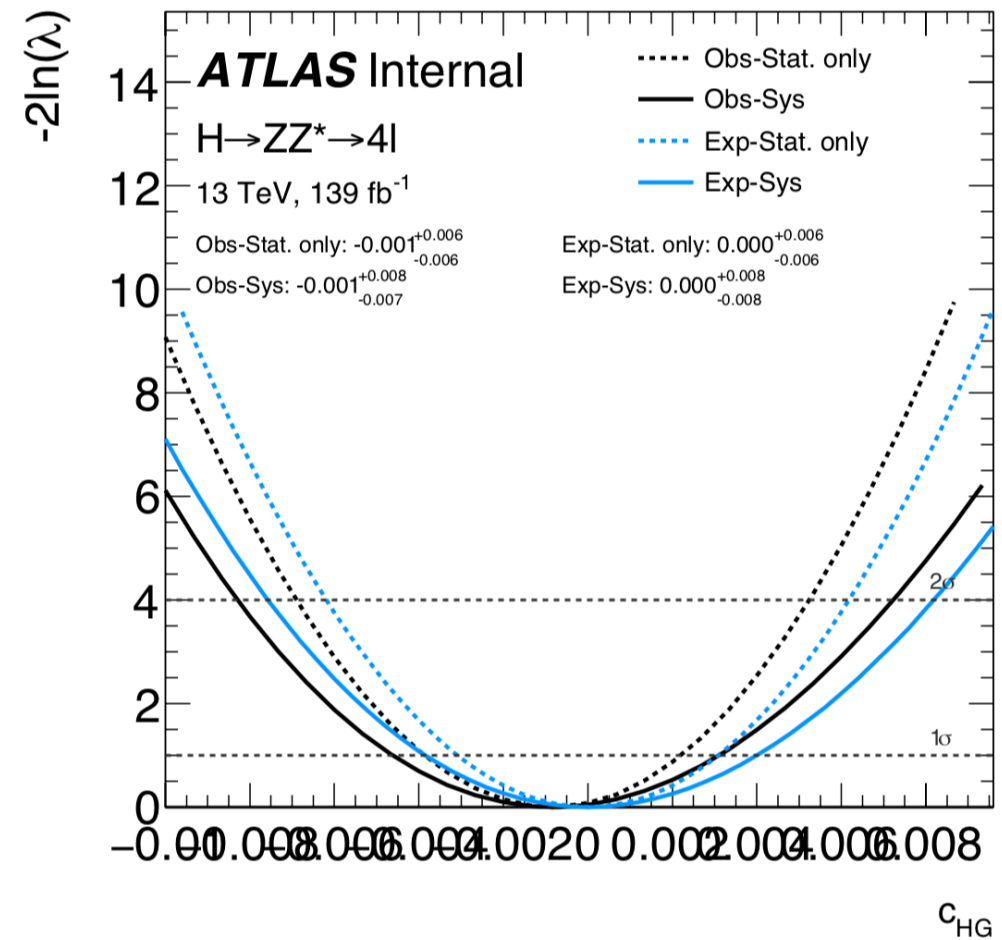
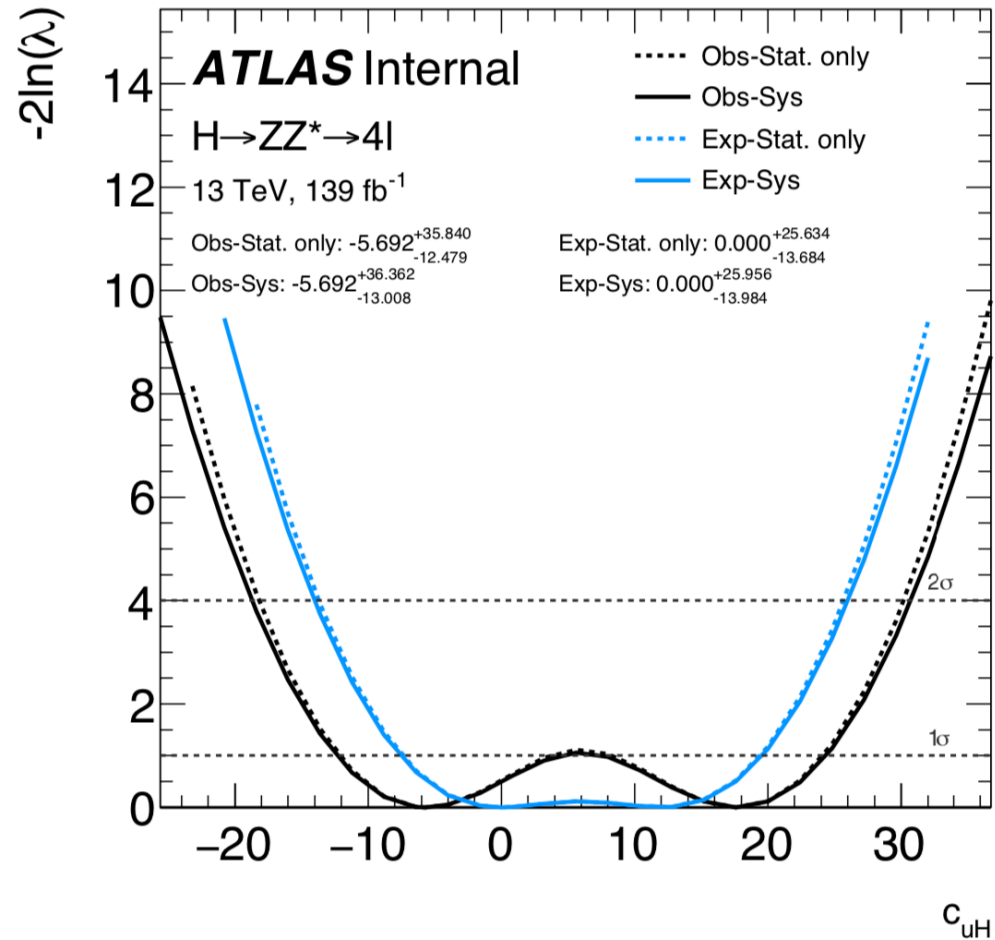
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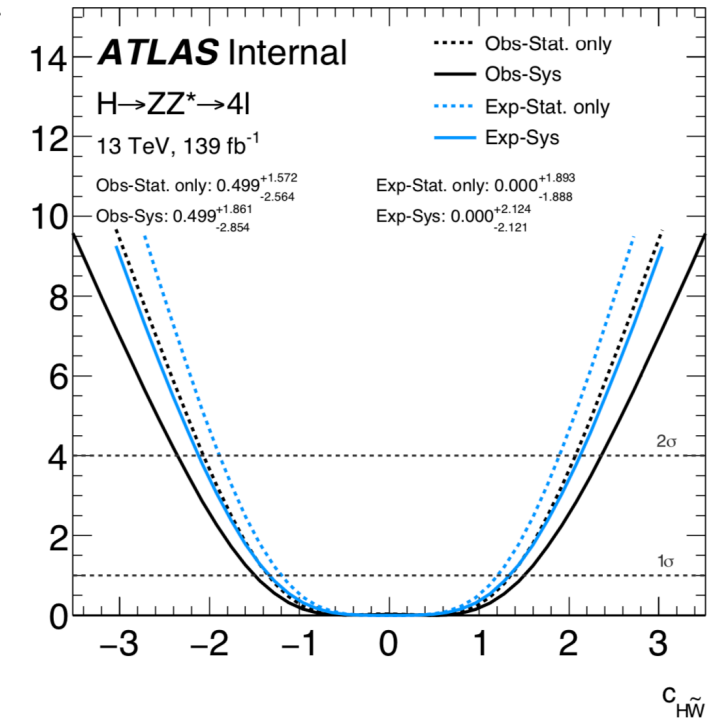
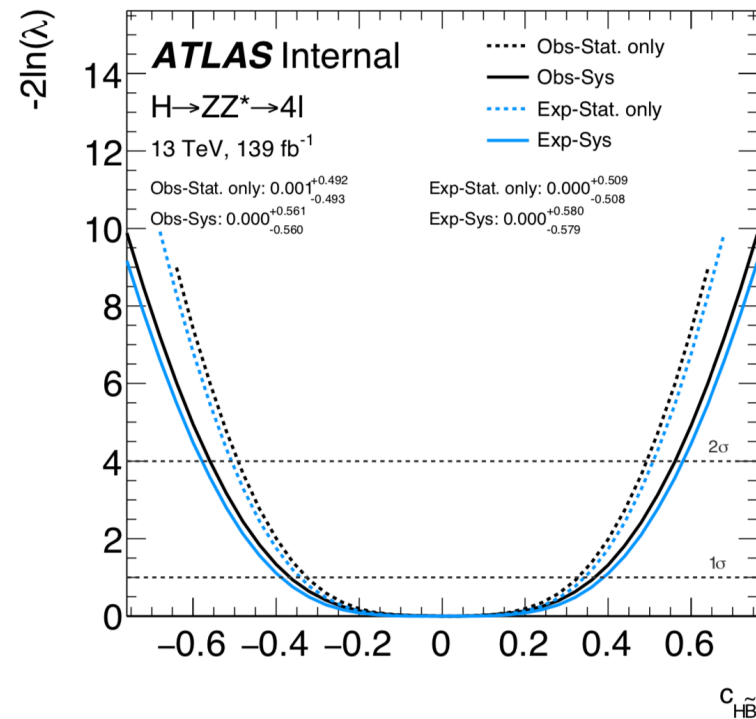
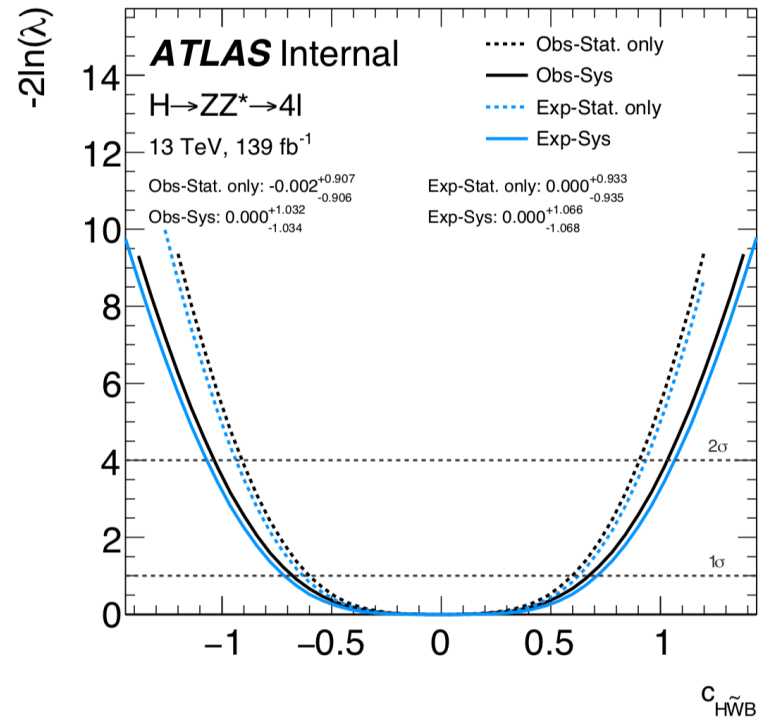
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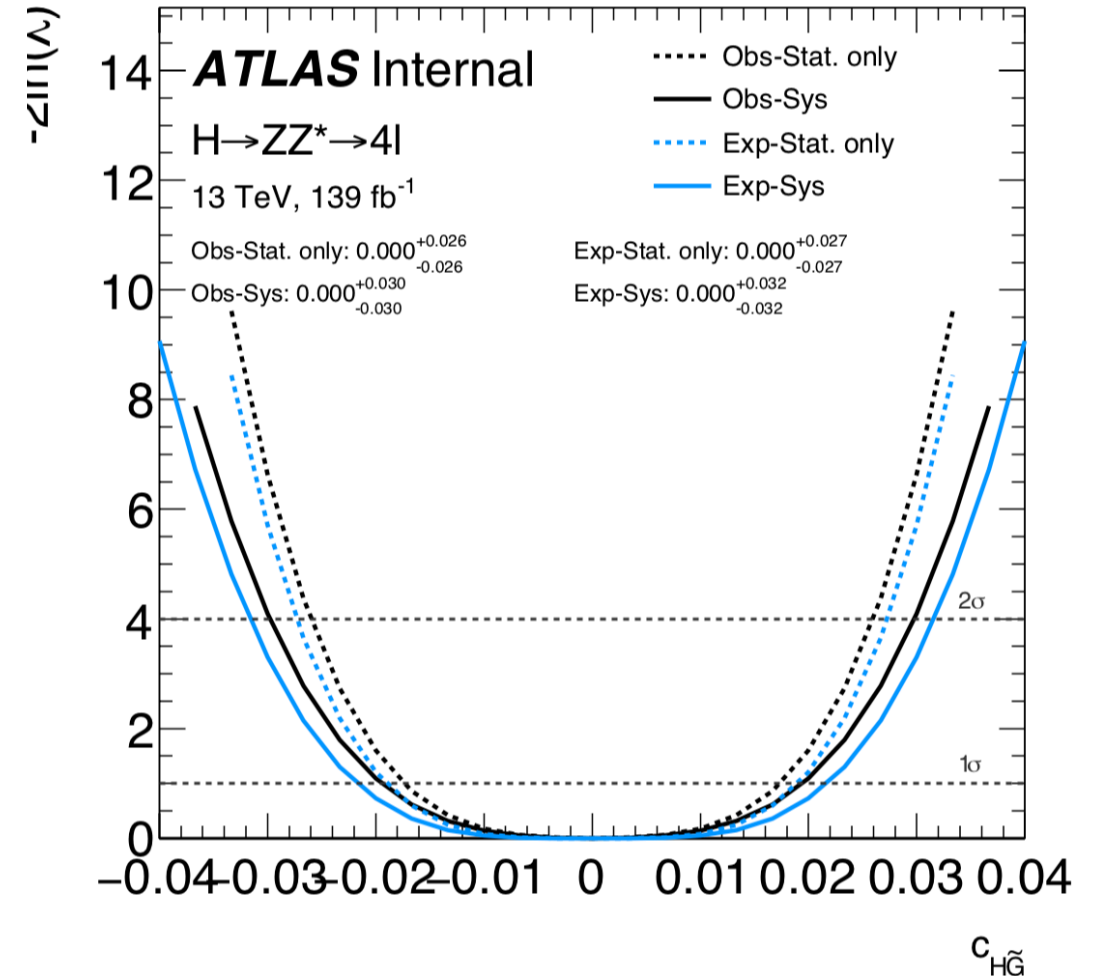
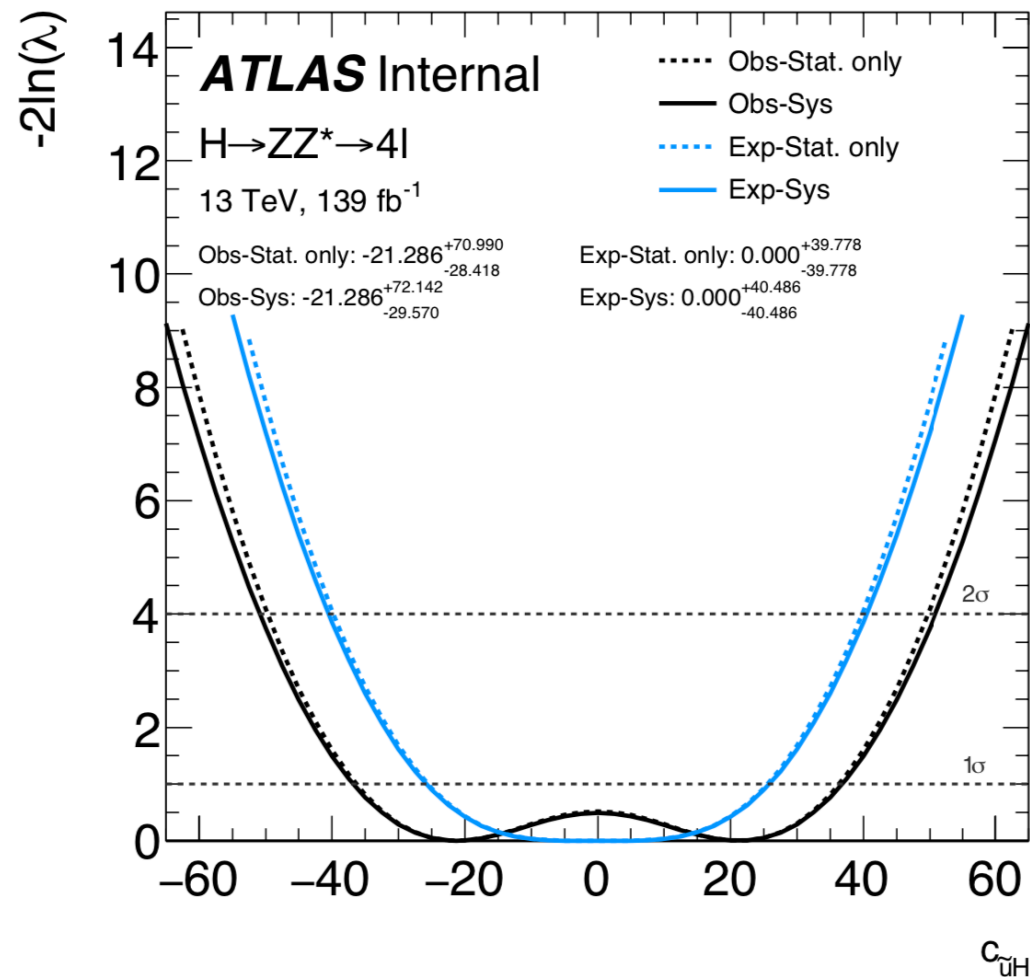
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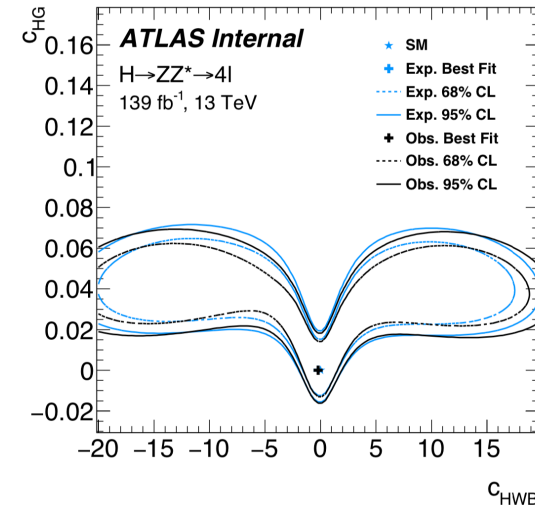
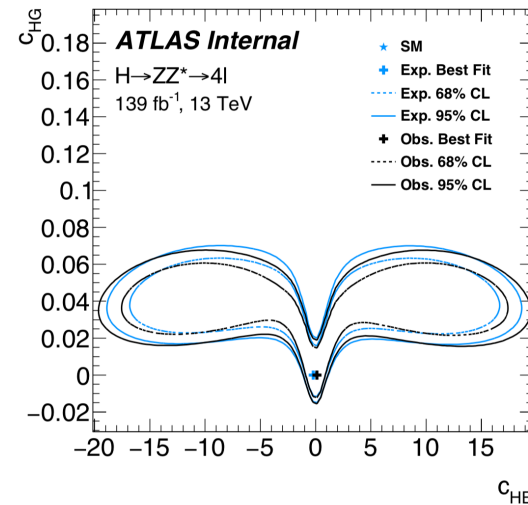
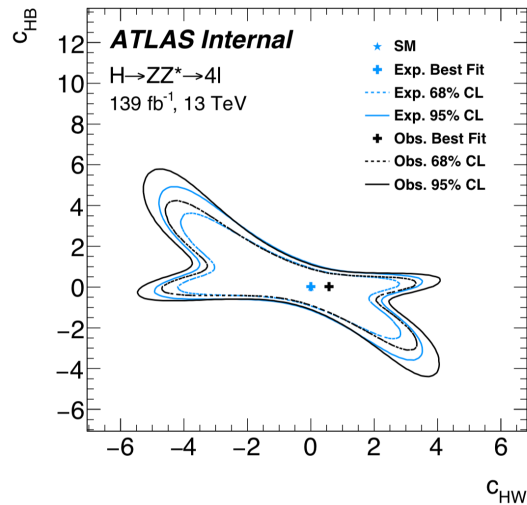
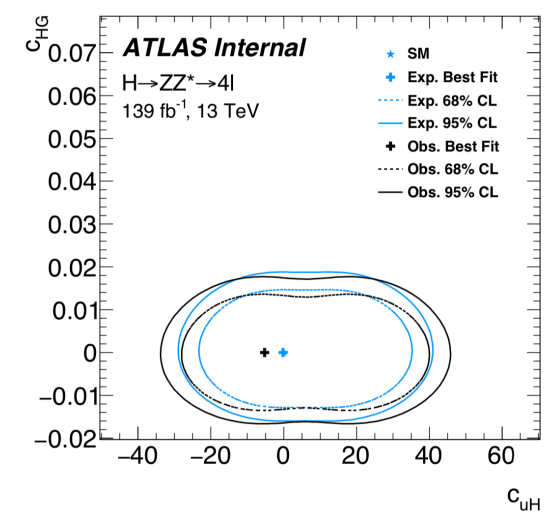
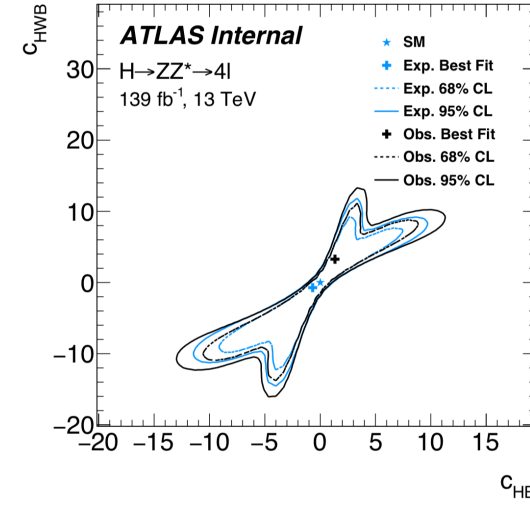
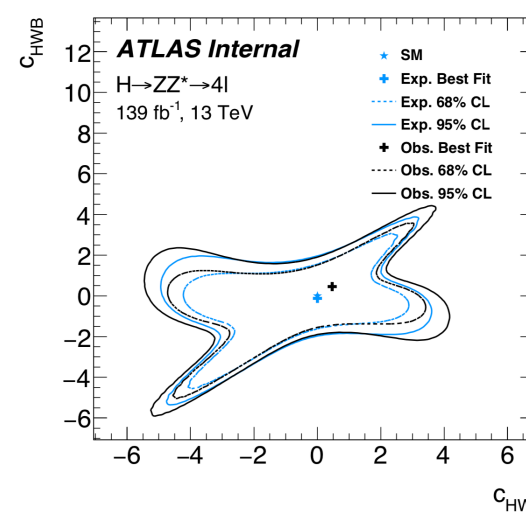
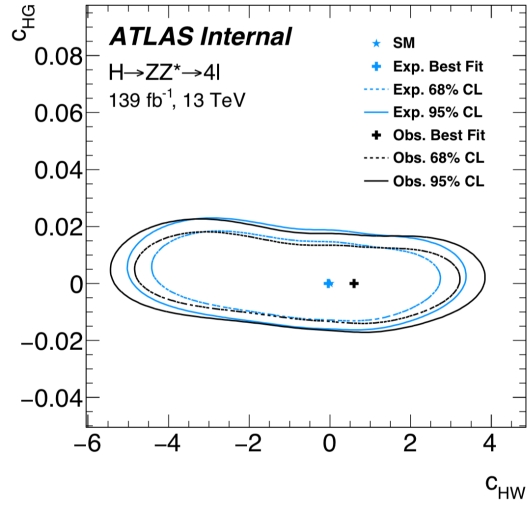
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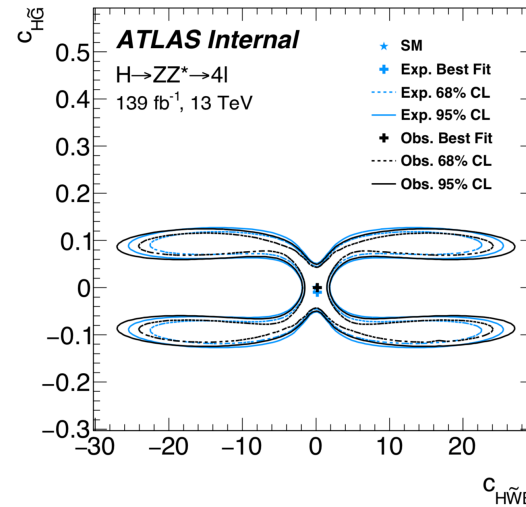
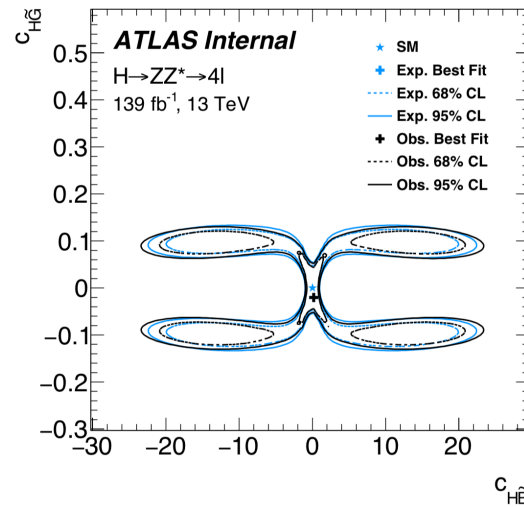
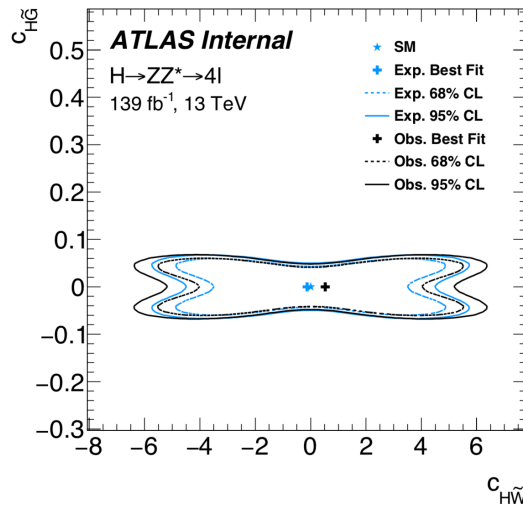
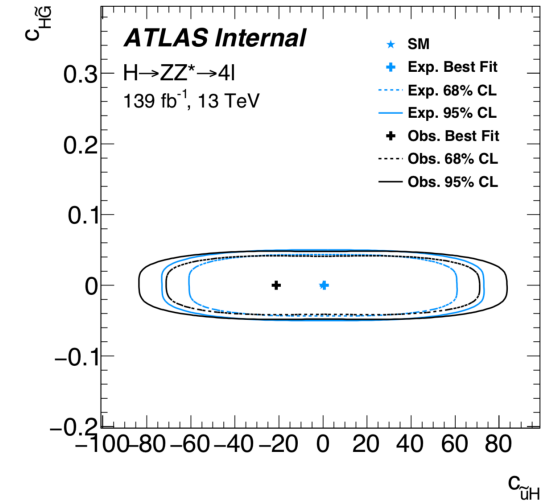
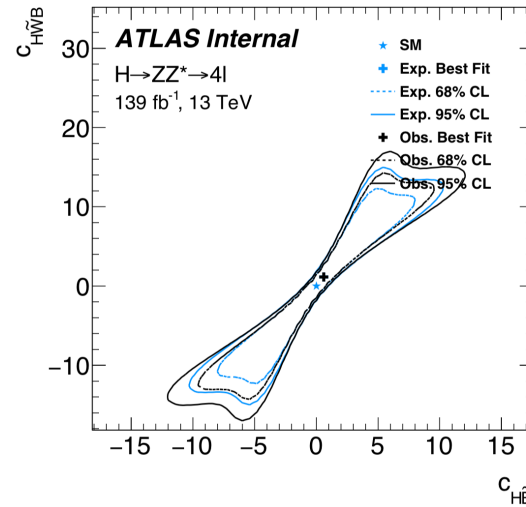
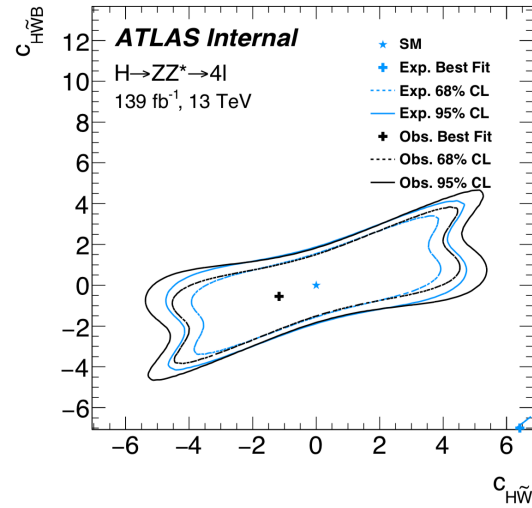
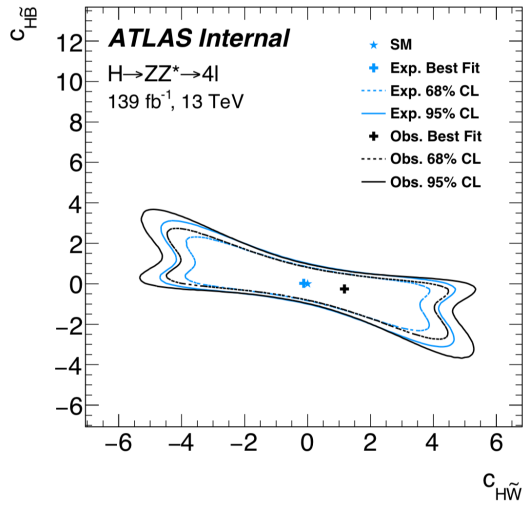
Results EFT Interpretation



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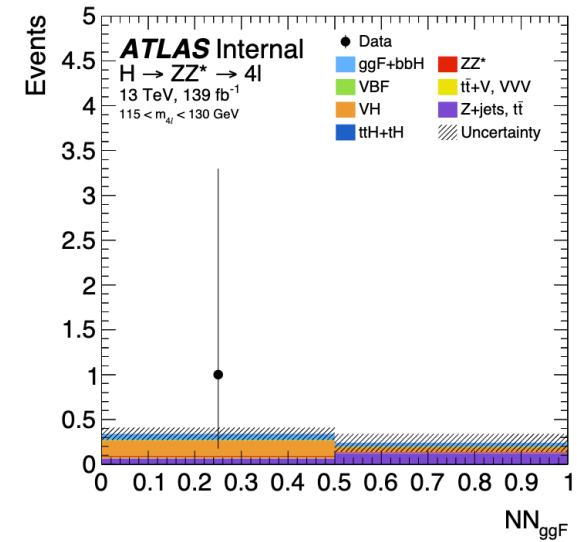
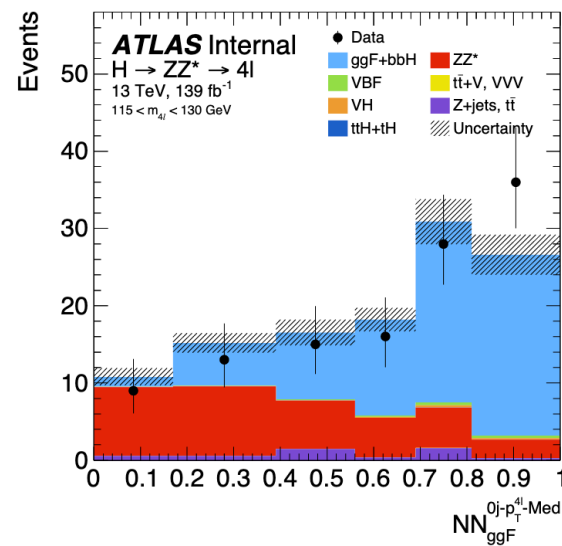
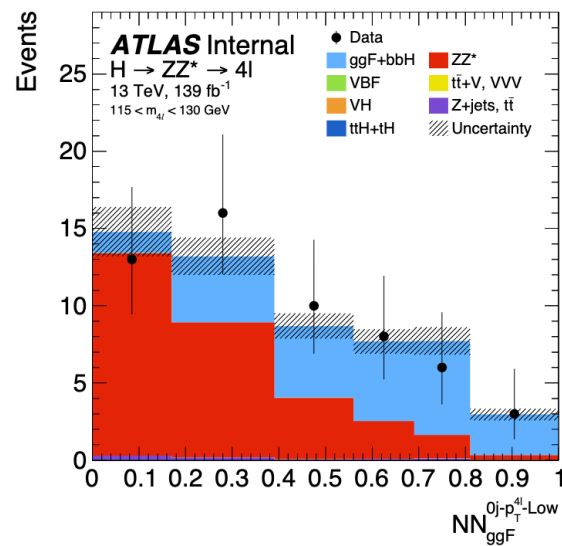


Results EFT Interpretation



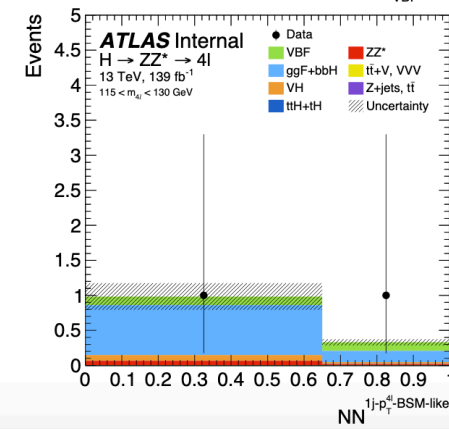
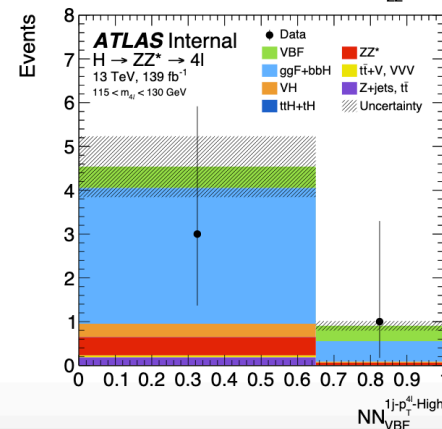
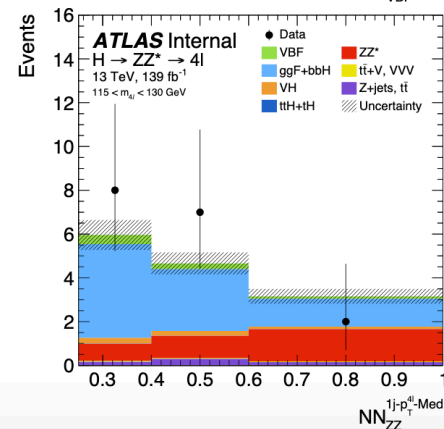
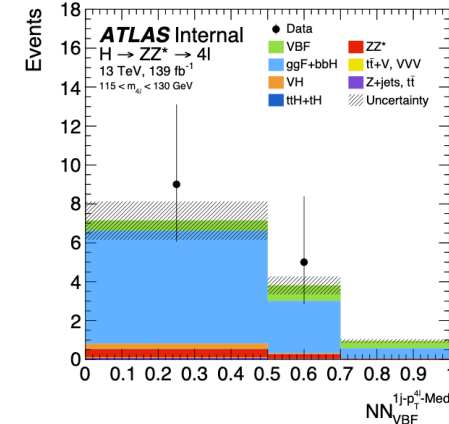
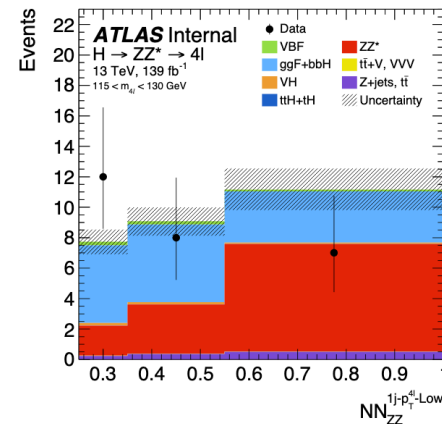
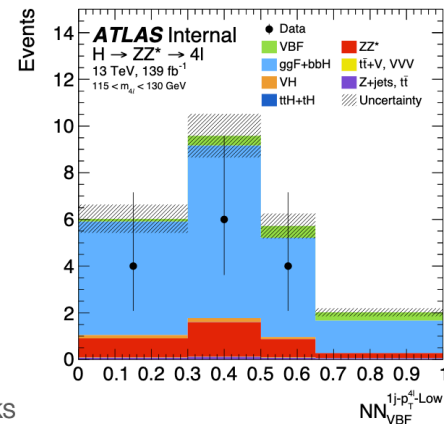
NN Plots: 0 Jet

- No major changes to 0-jet category!
- Some migration of events from EMTopo results to 1 jet categories
- 0-jet High is cut and count



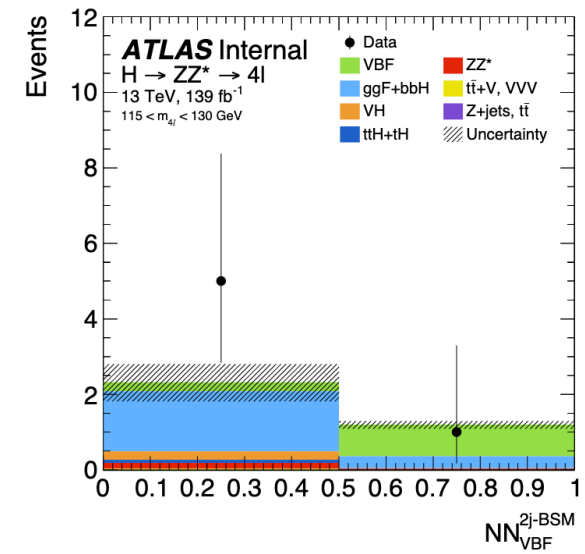
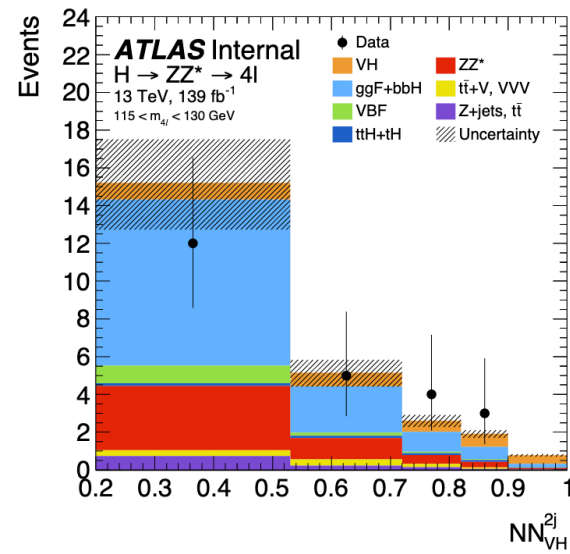
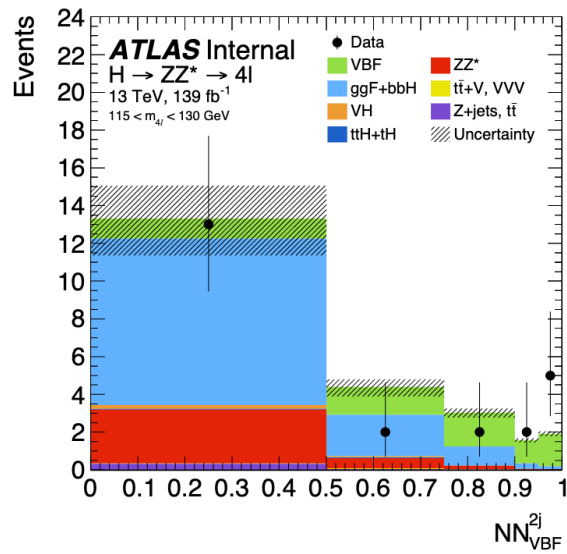
NN Plots: 1 Jet

- Some migration from 0-jet to 1-jet low without jvt
- Especially for background blocks

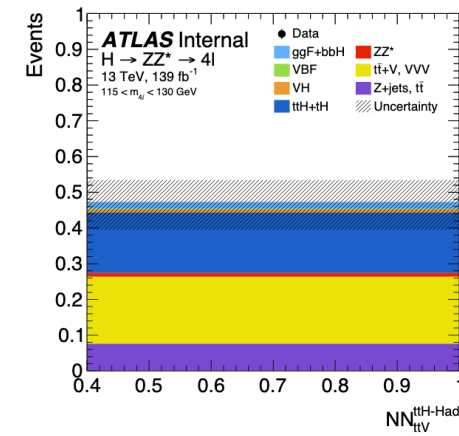
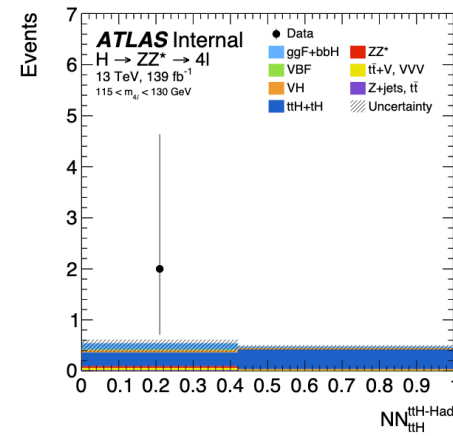
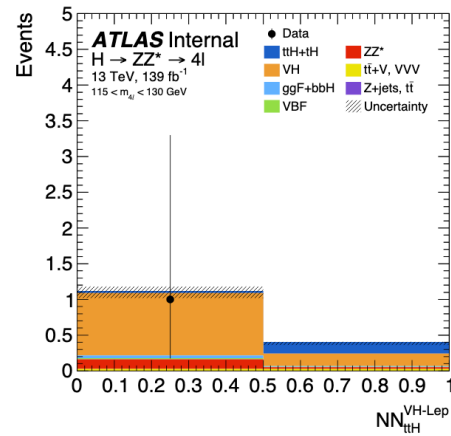


NN Plots: 2 Jet

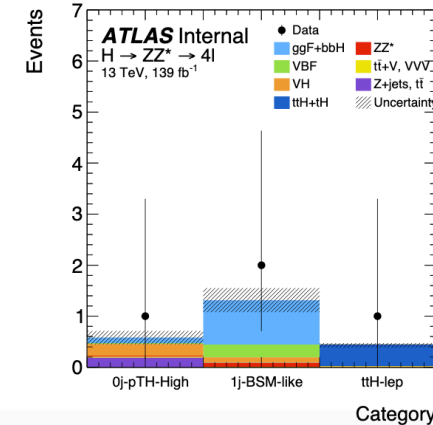
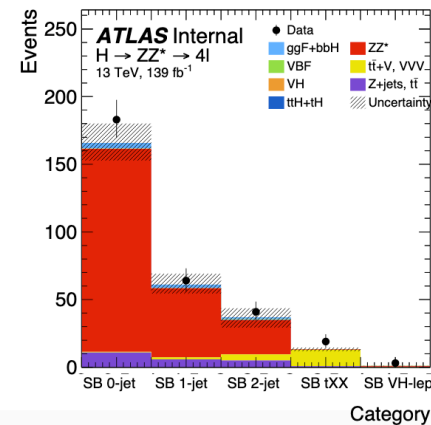
- Lost event in highest VH leptonic bin
- Score moved one bin lower

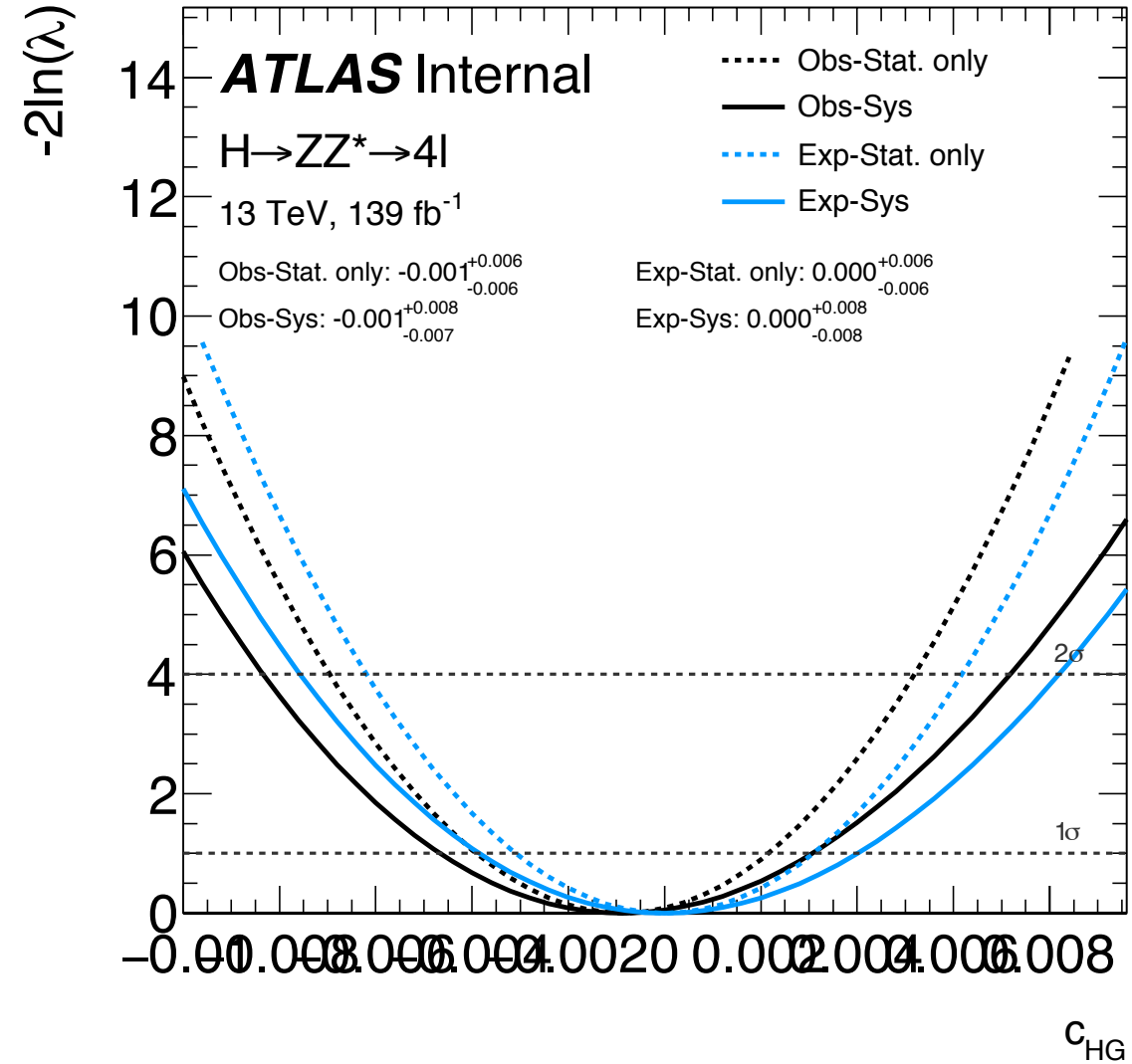


NN Plots: VH, ttH and SB

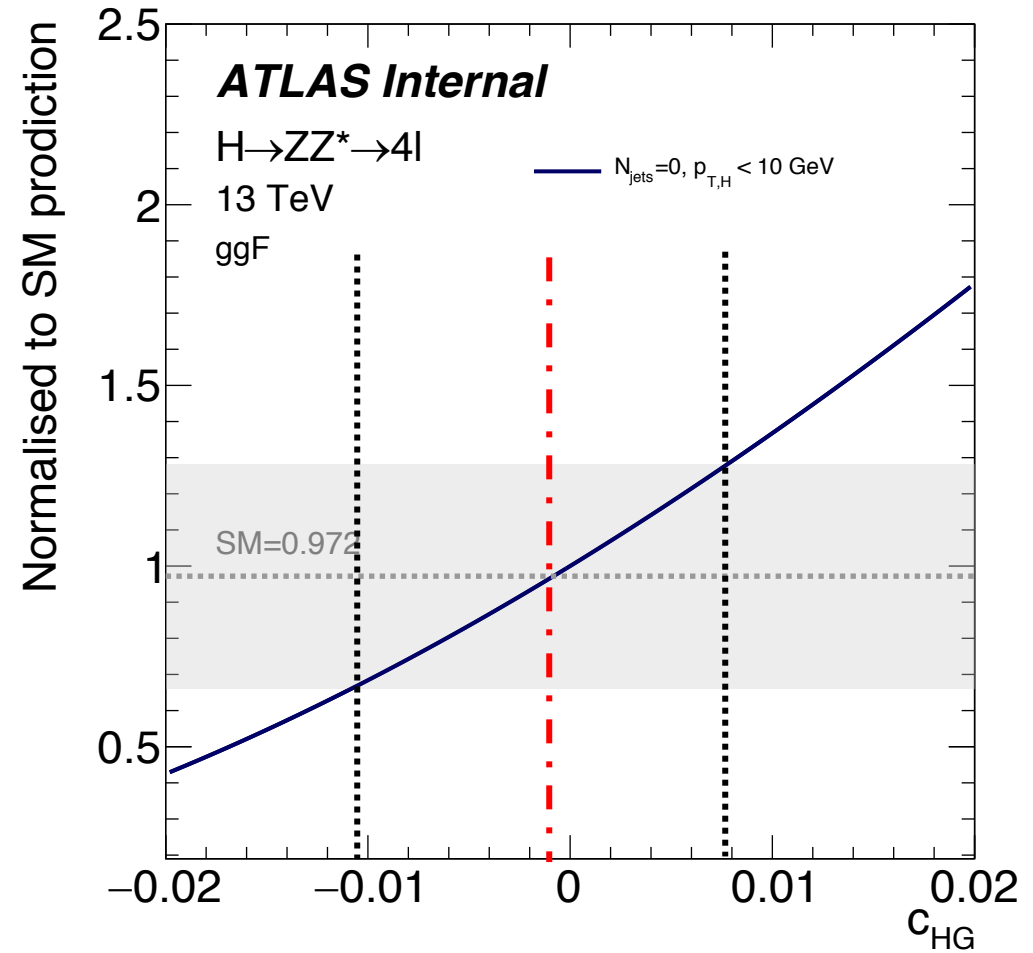
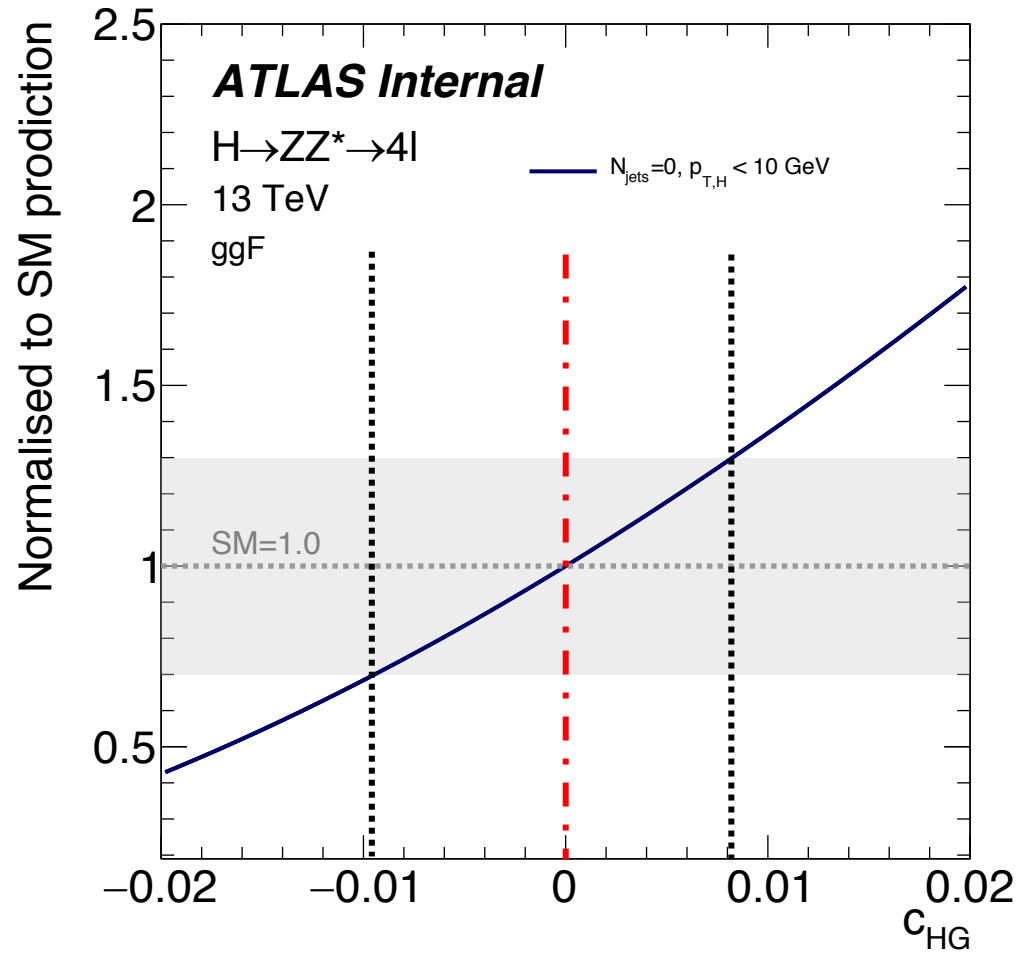


- Additional ttH hadronic event with low score
- No other significant changes

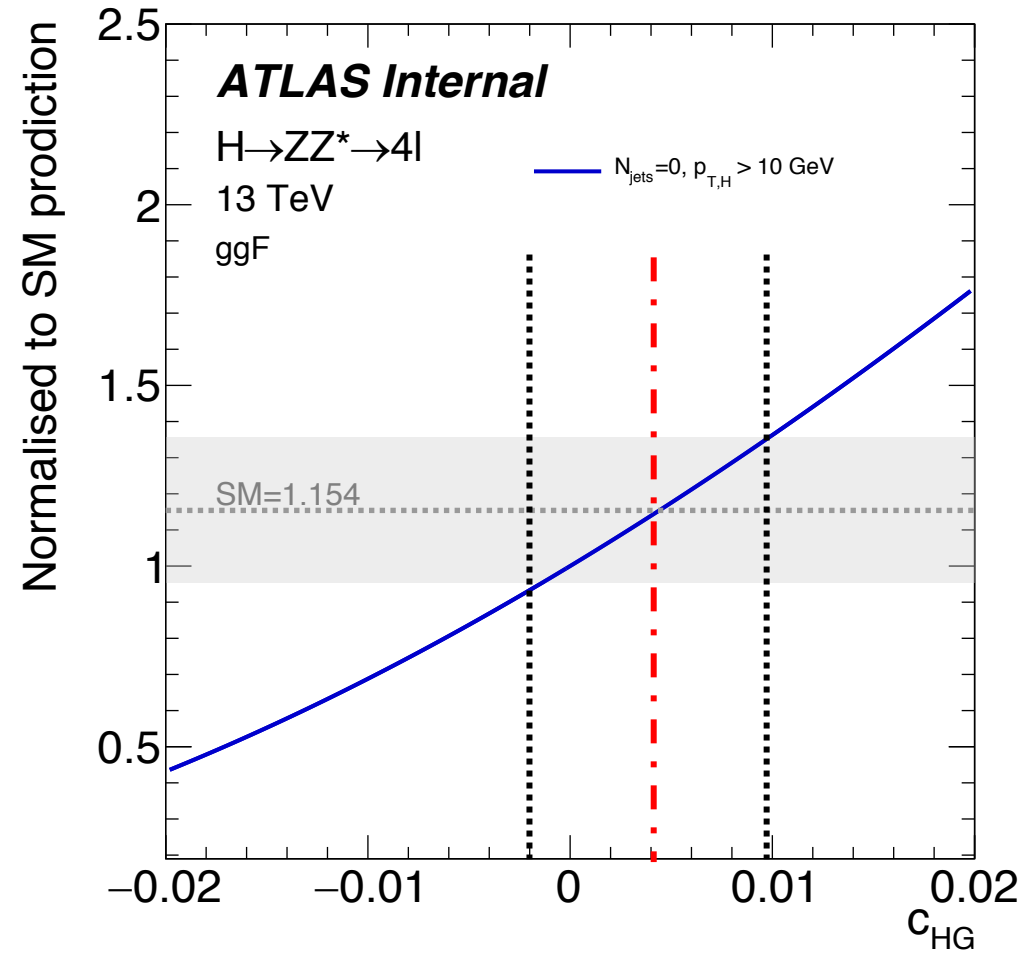
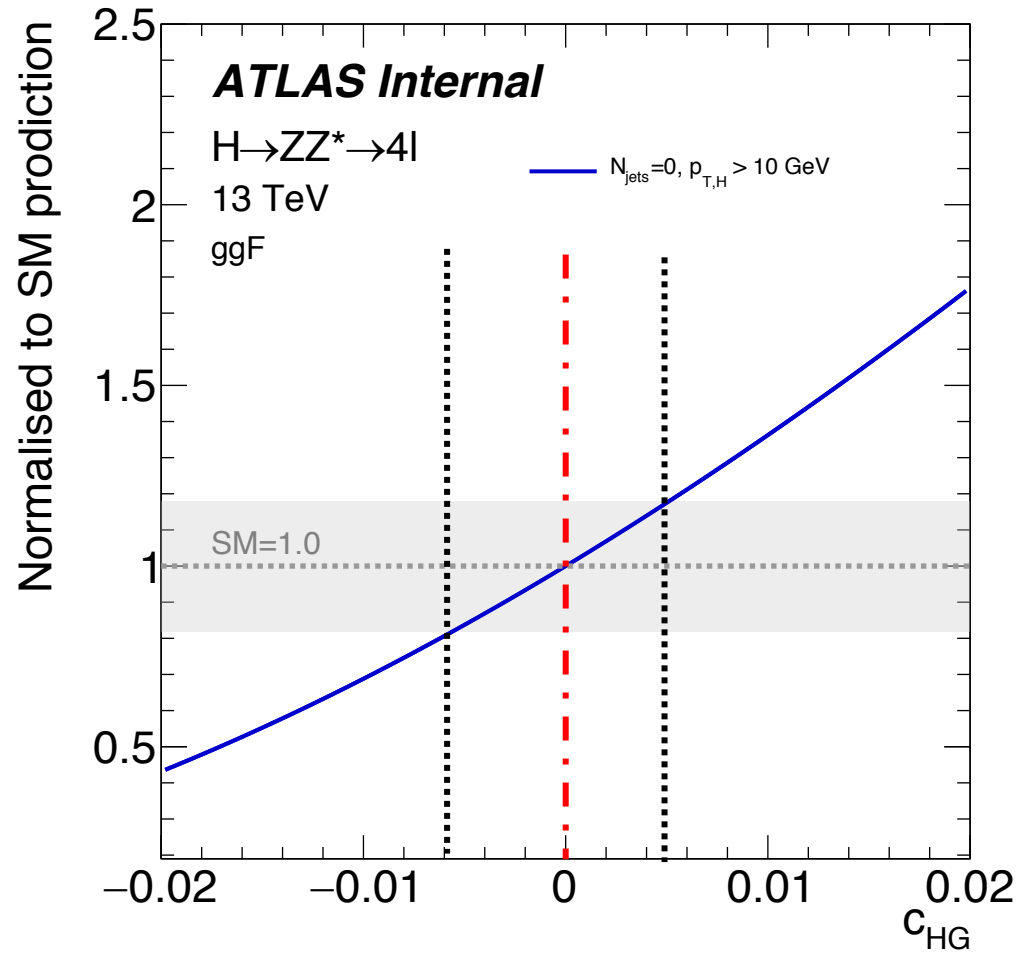




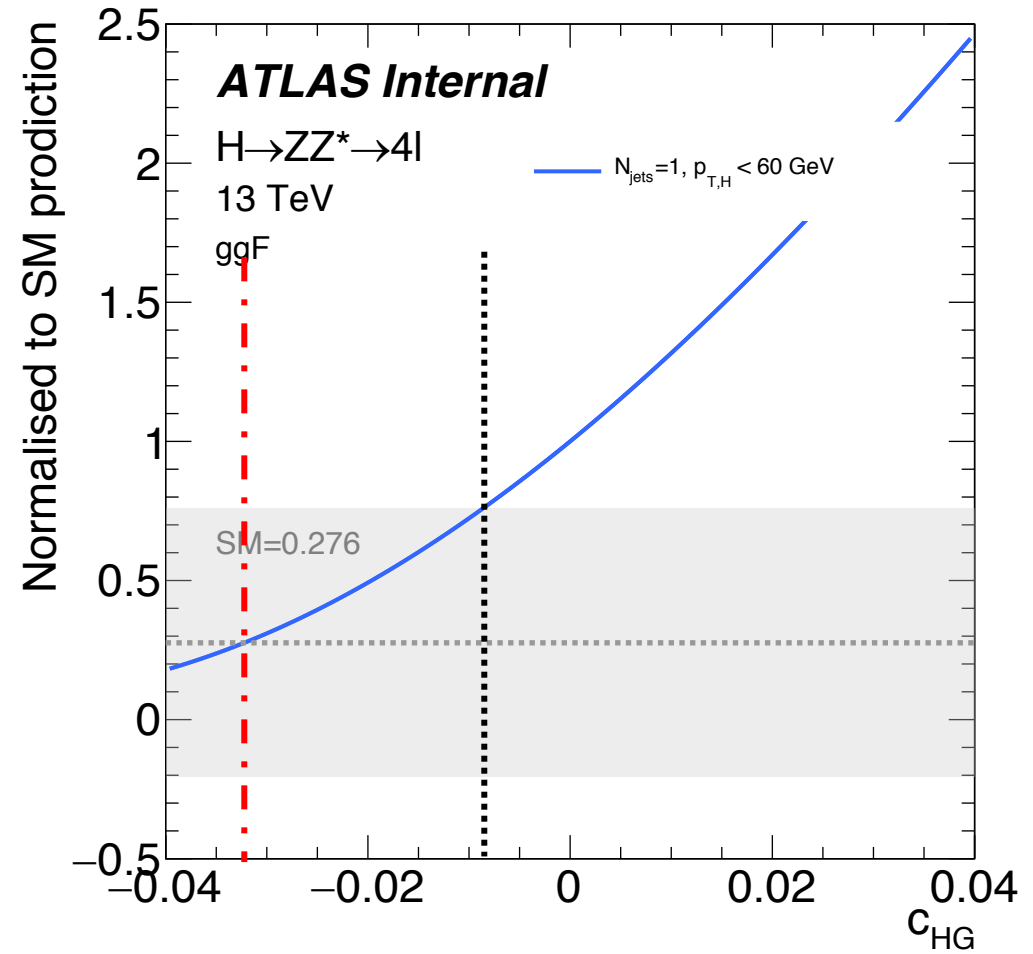
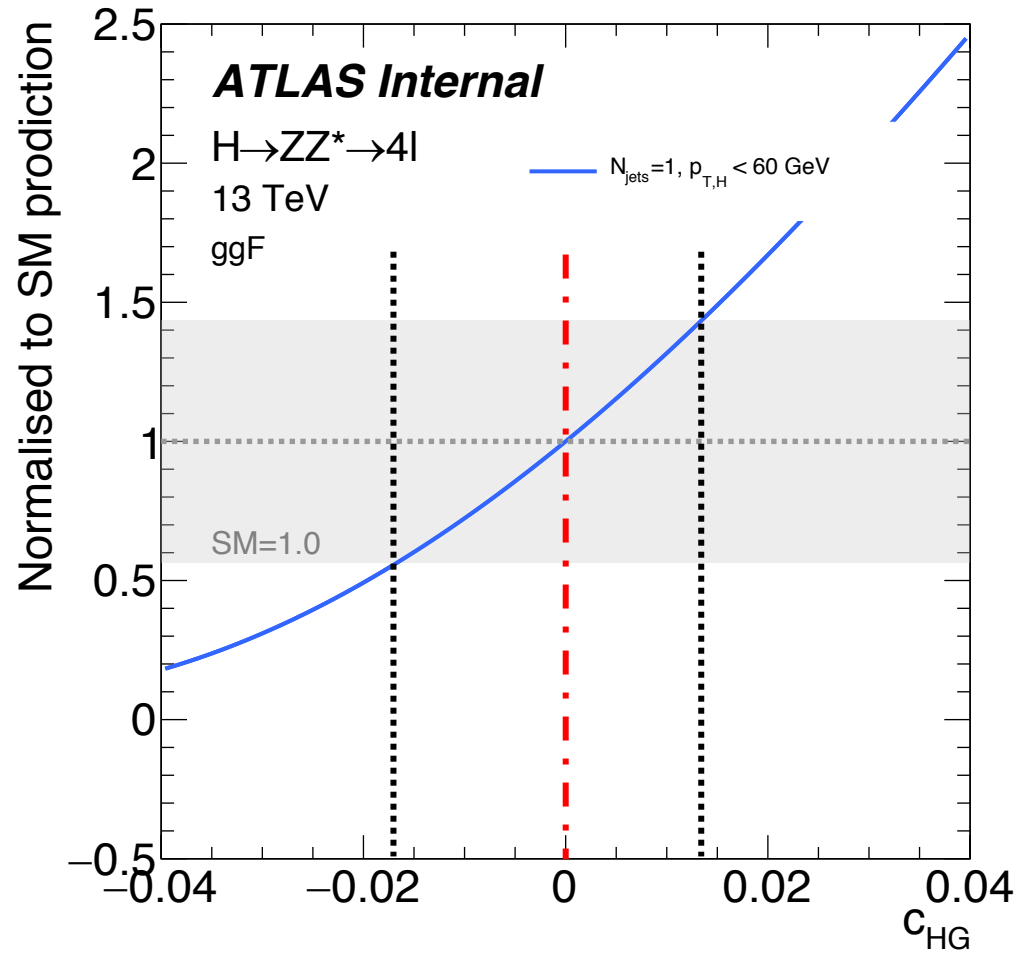
gg2H-0j-pTH-Low



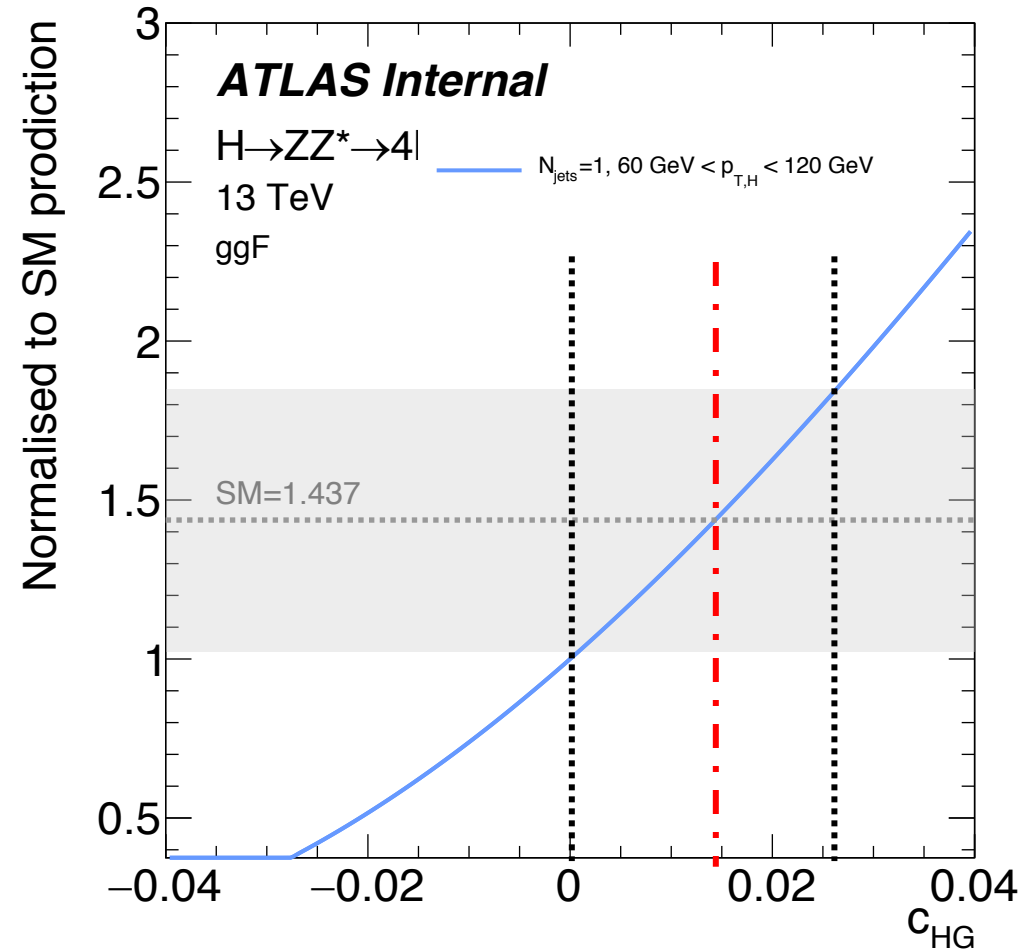
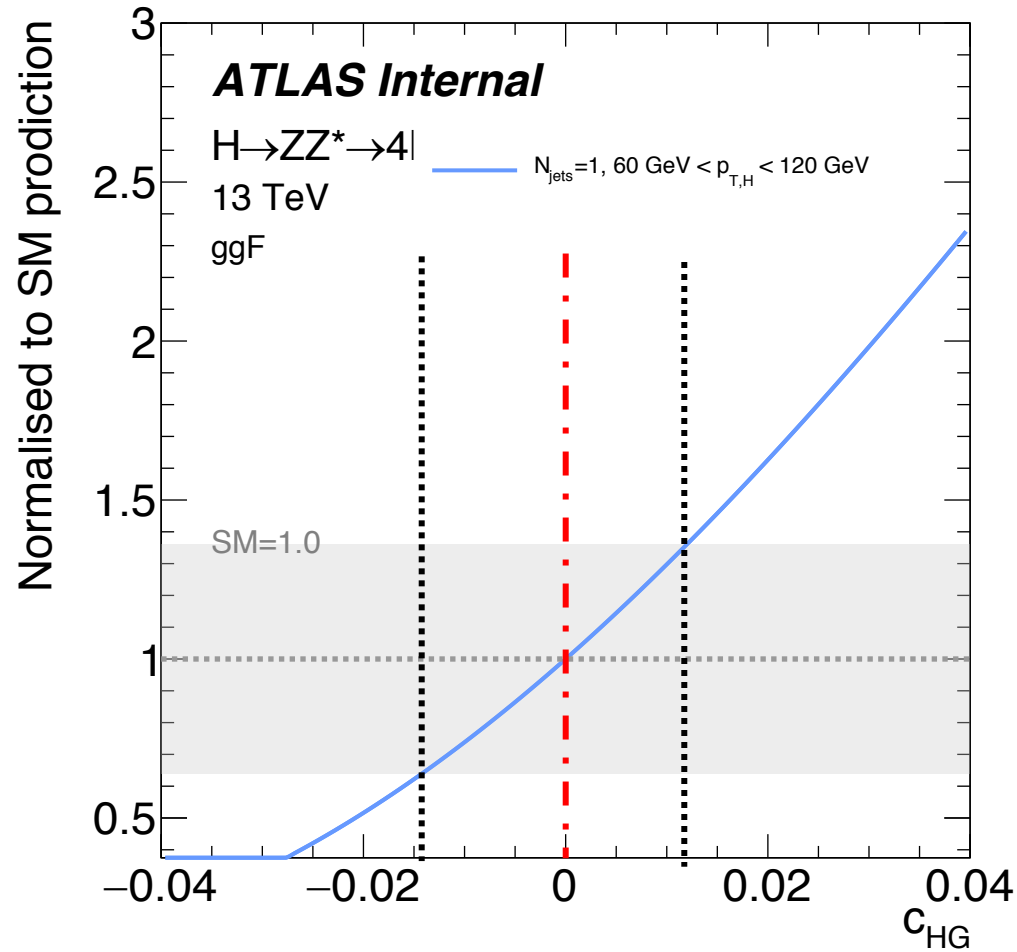
gg2H-0j-pTH-High



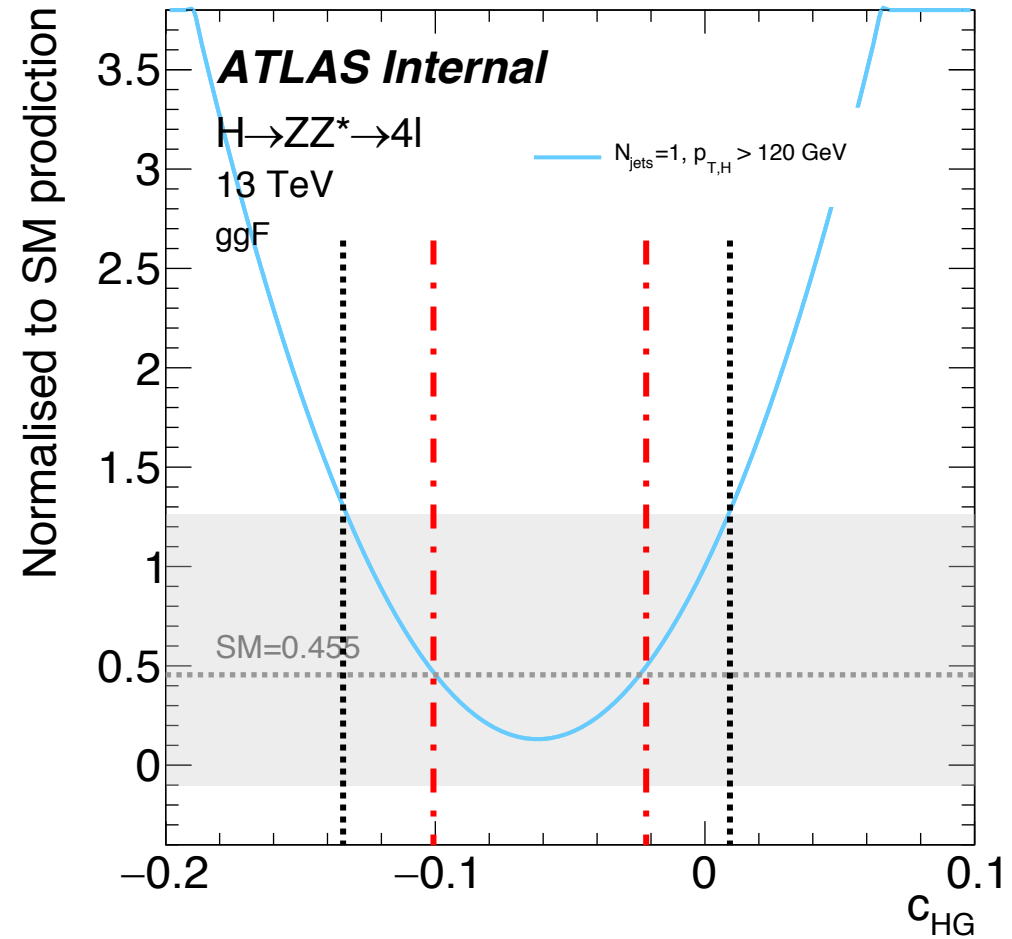
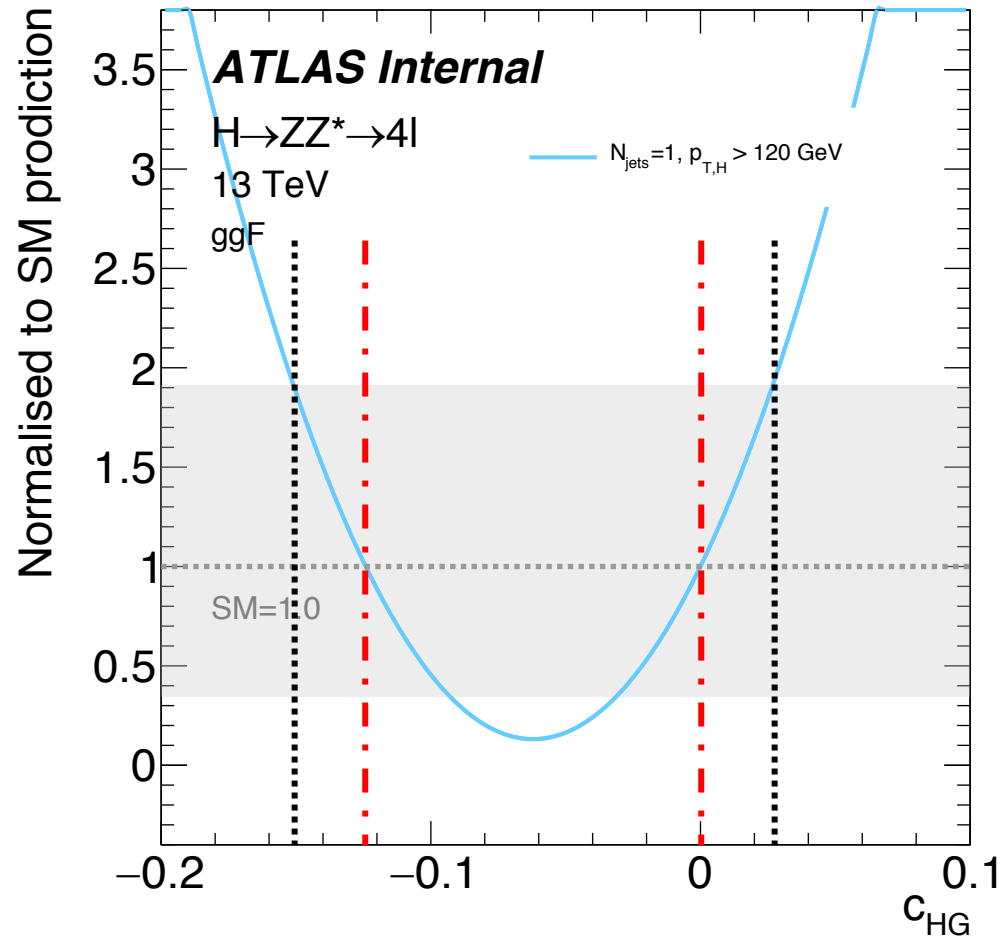
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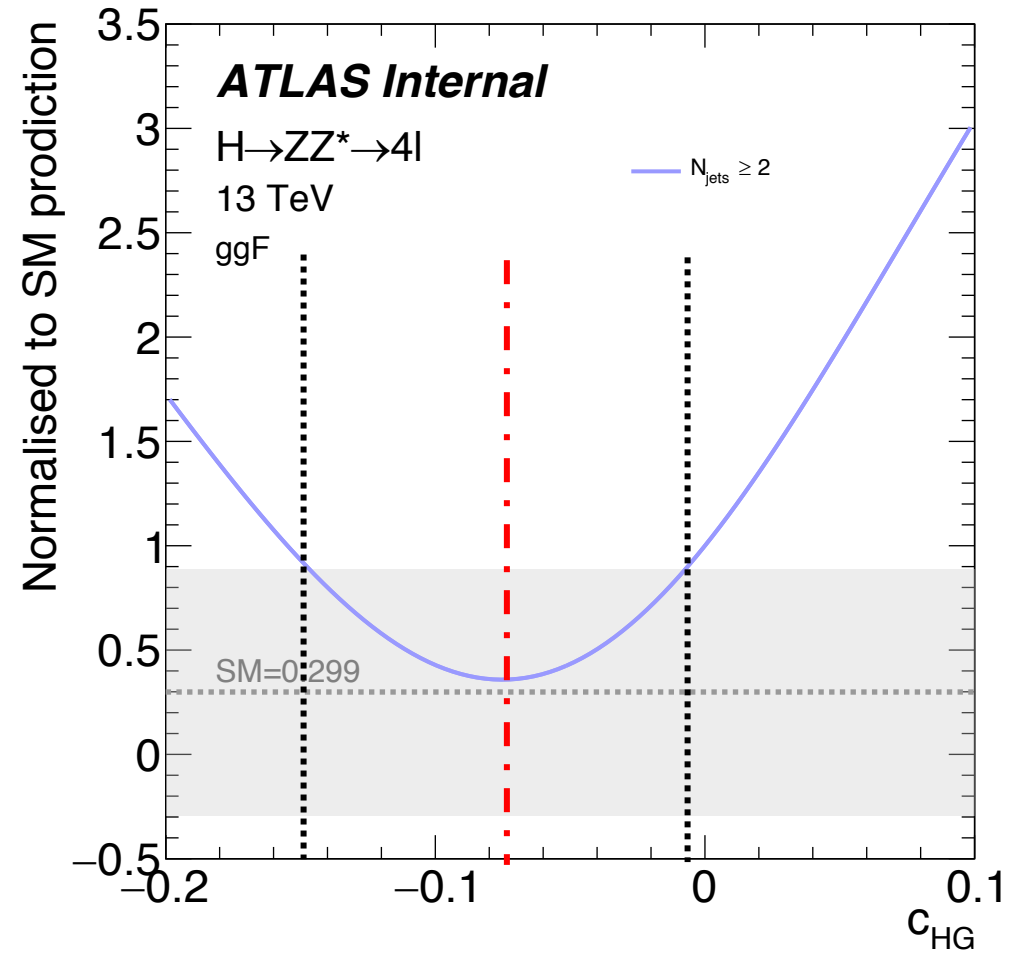
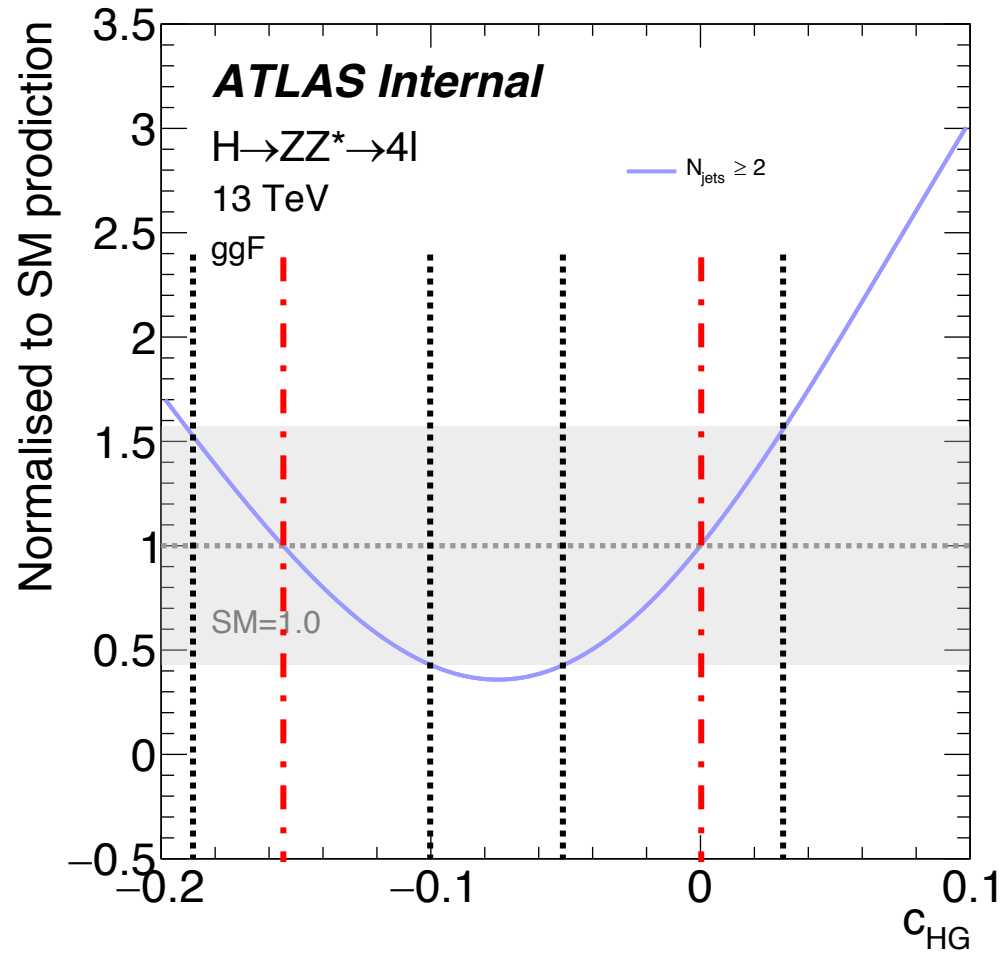
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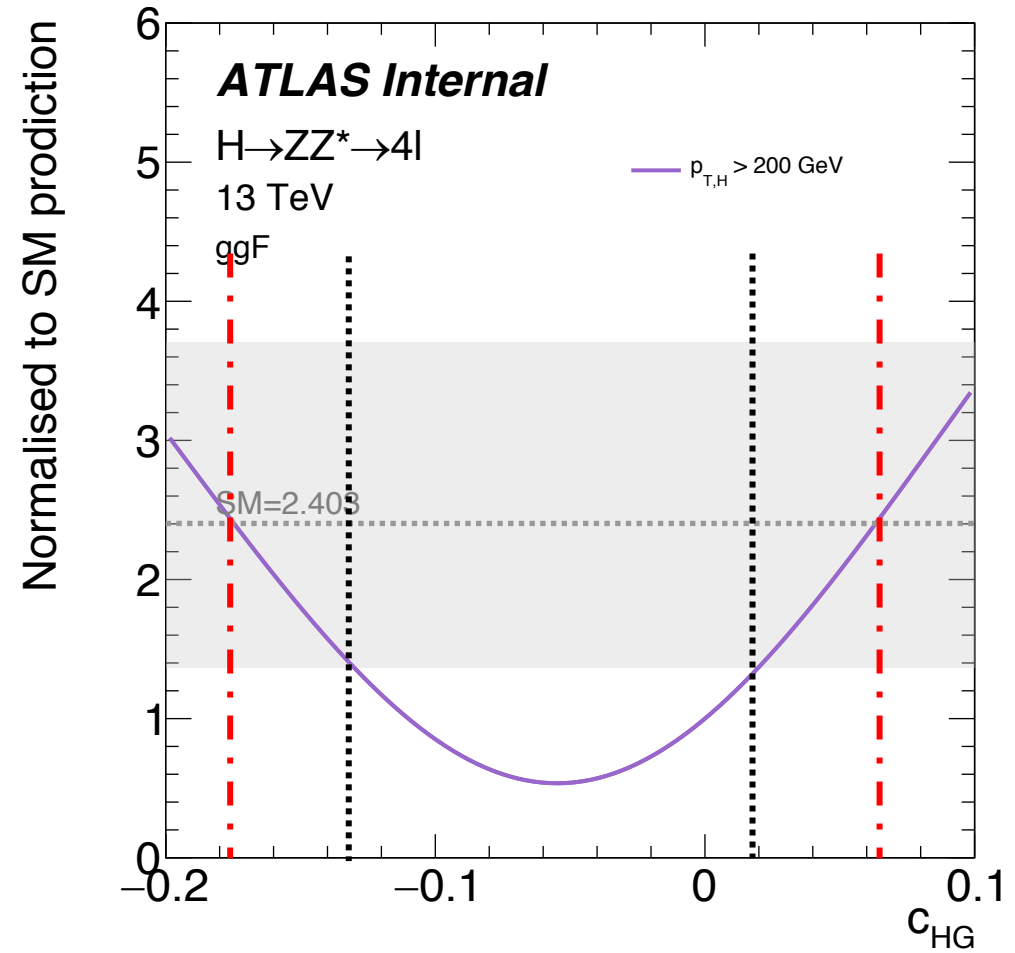
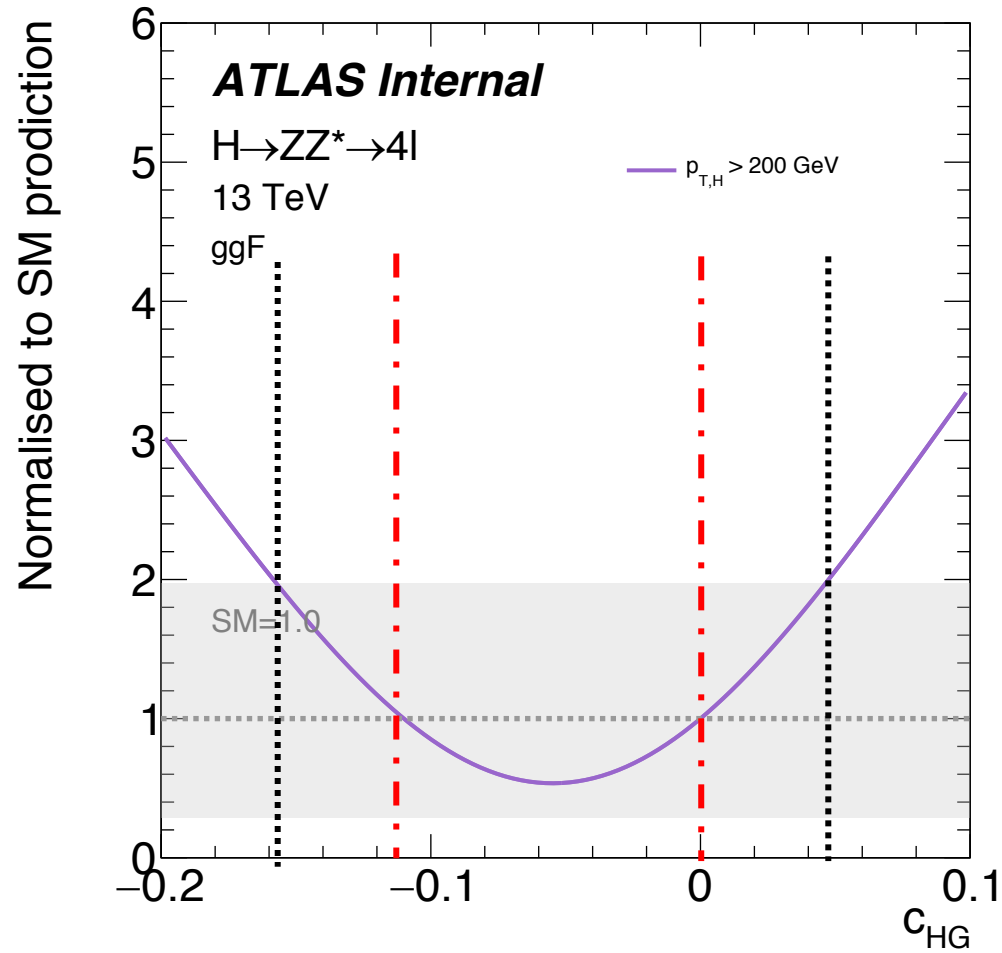
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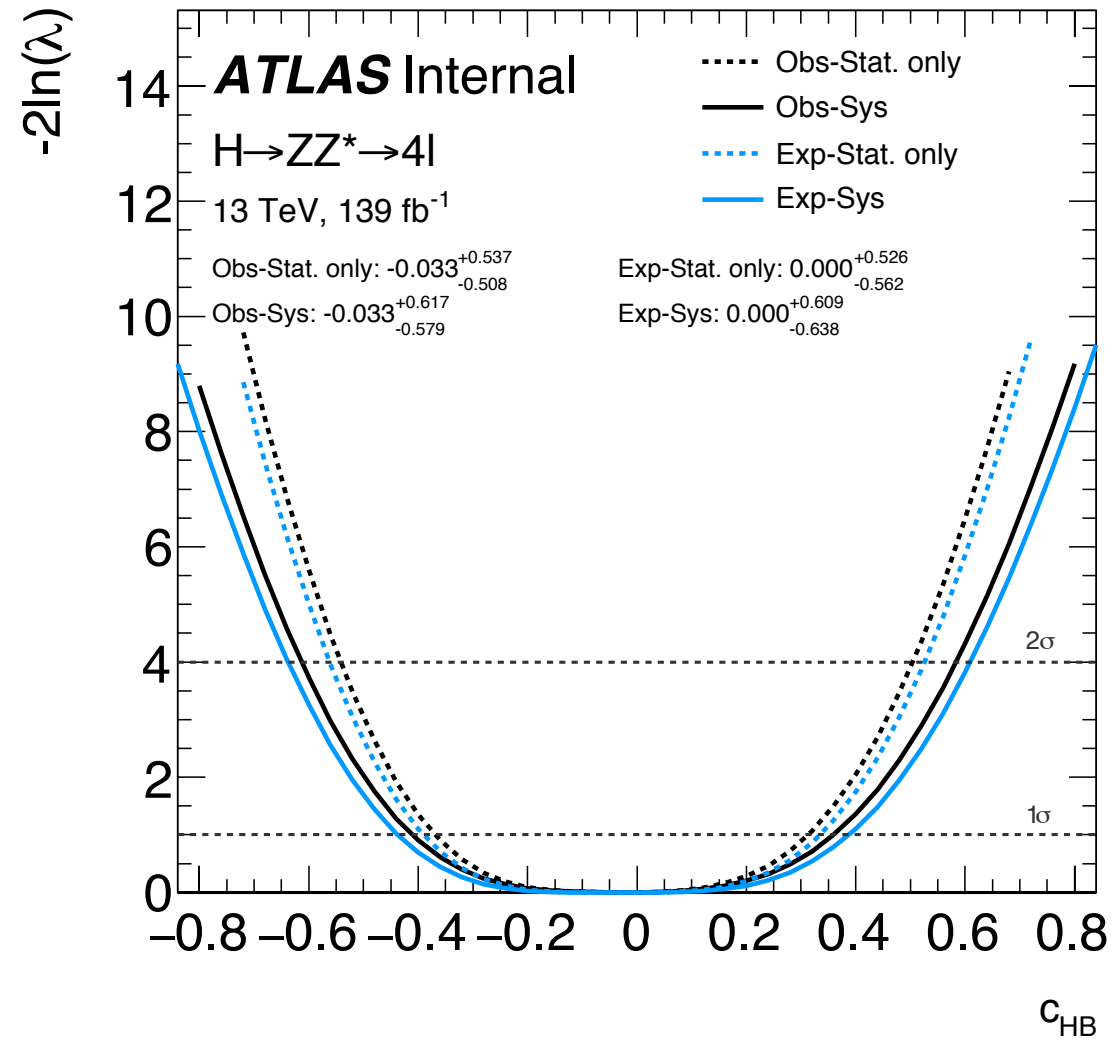


gg2H-2j

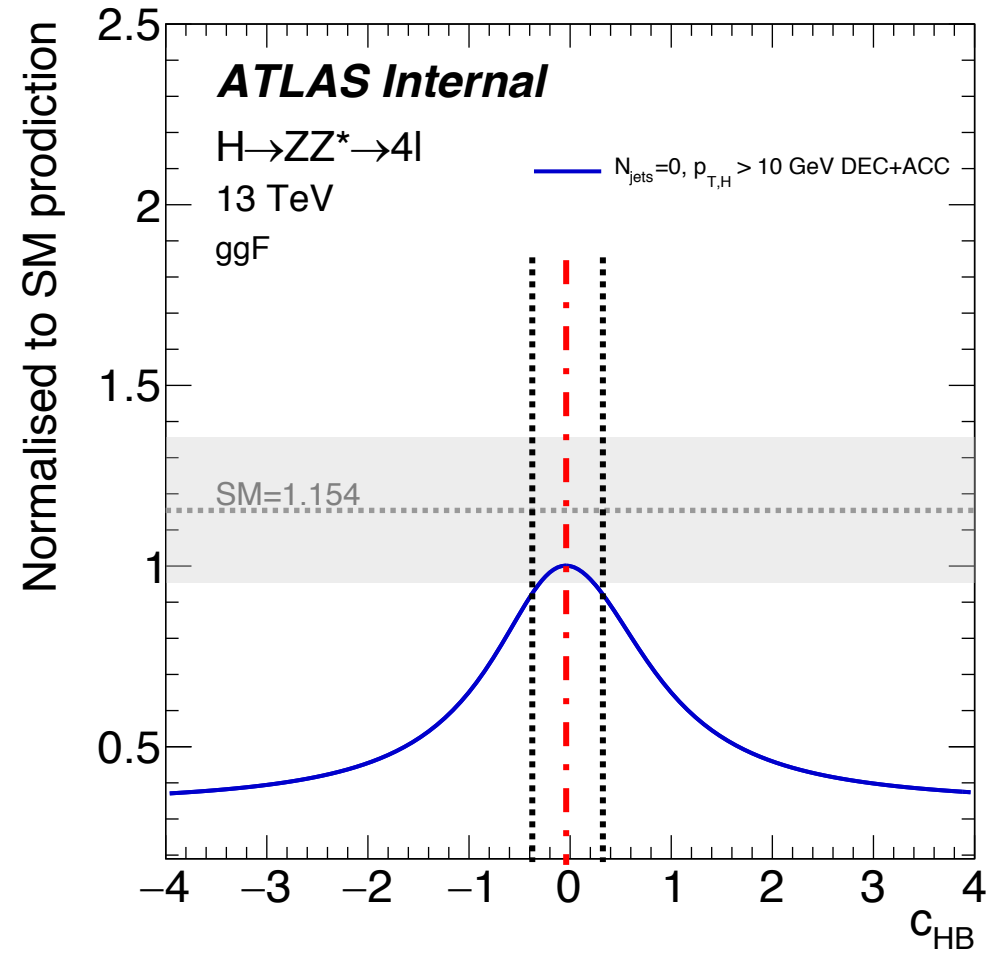
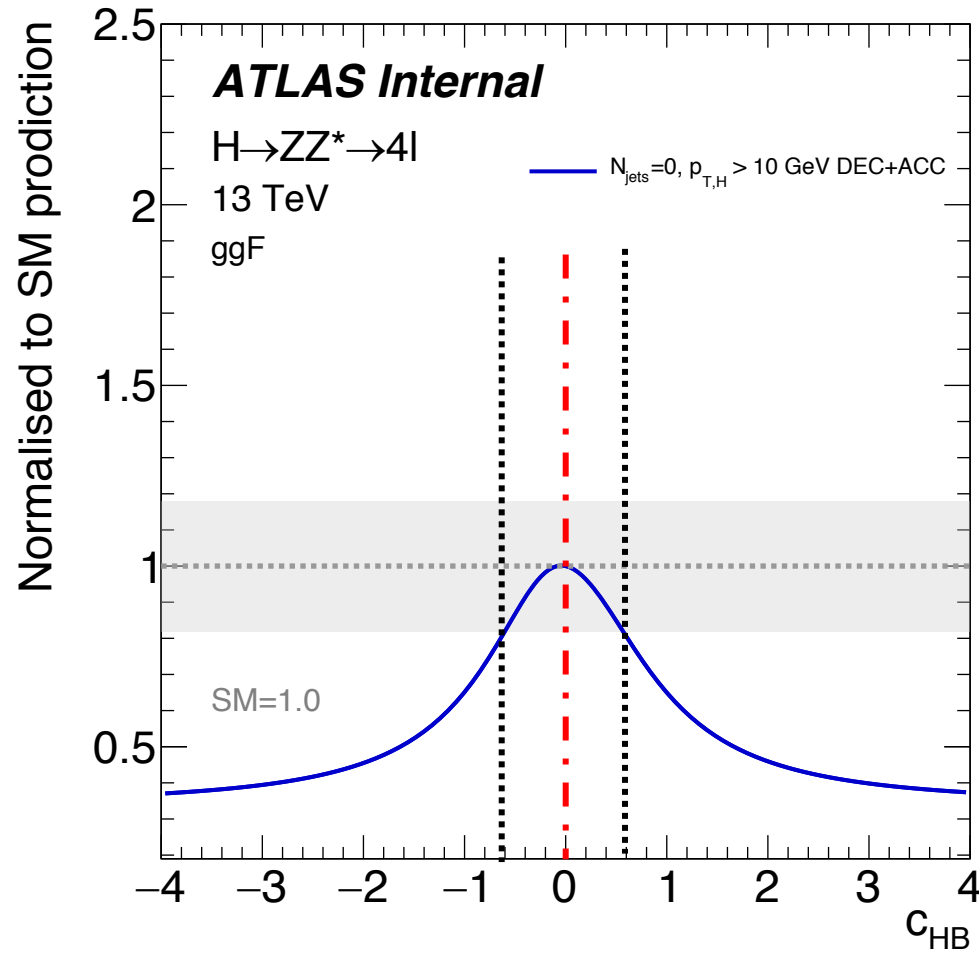


gg2H-pTH-High

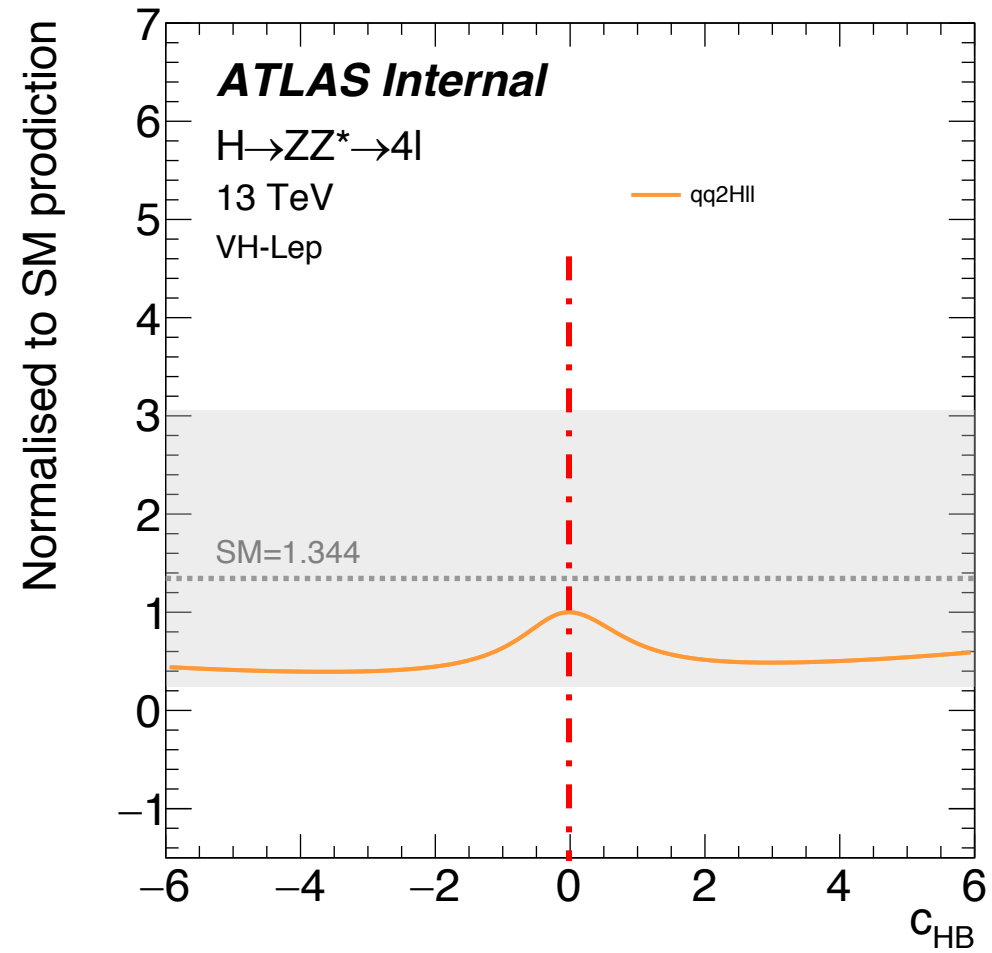
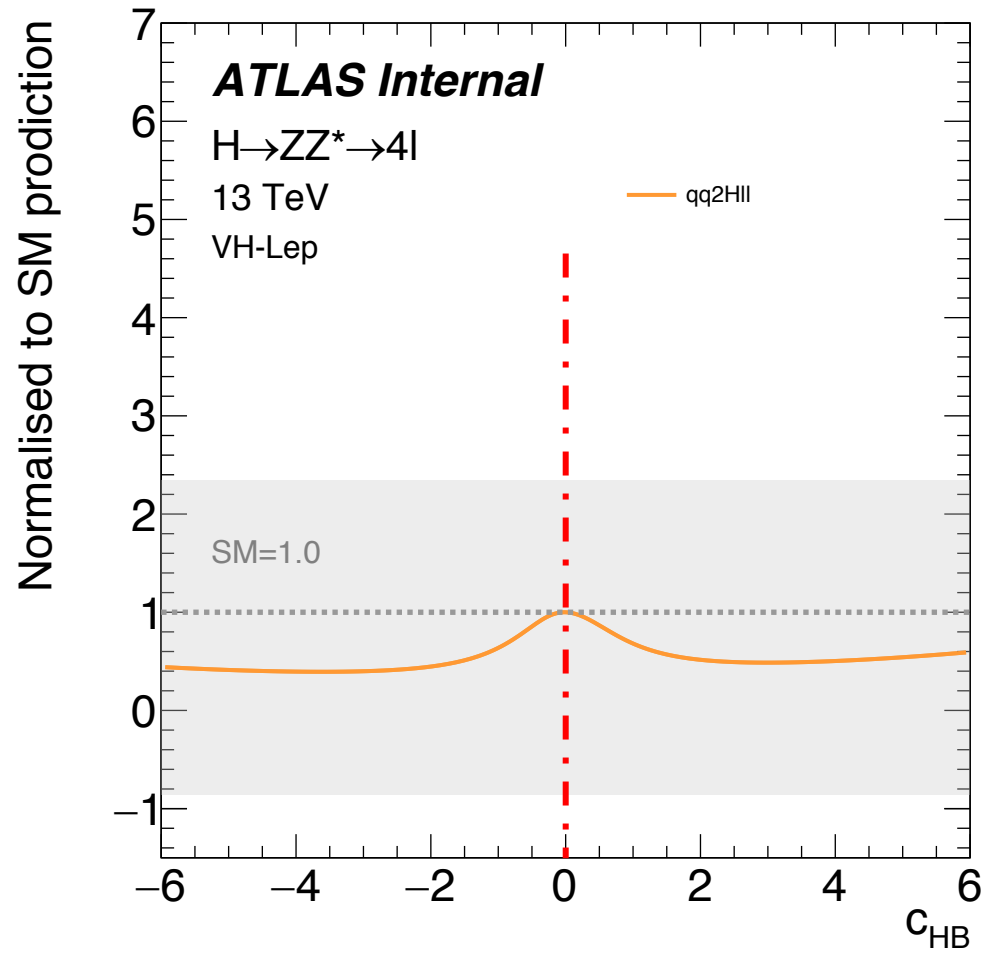




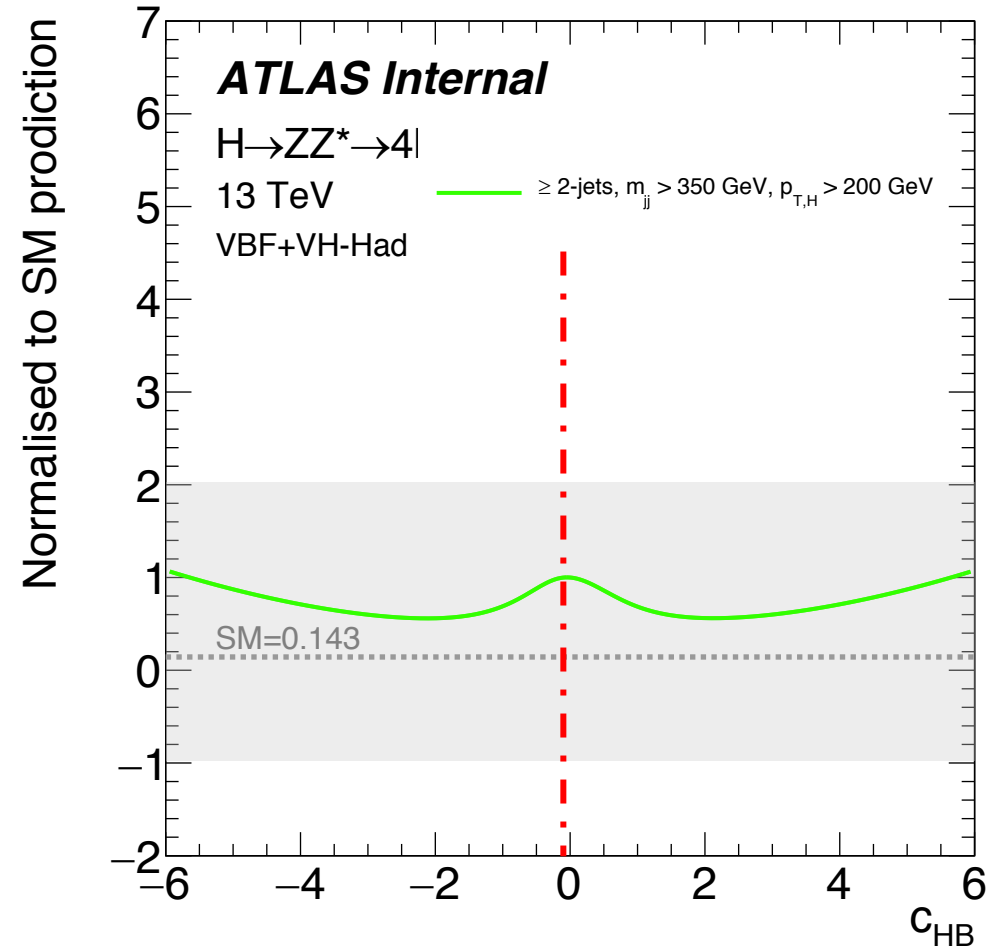
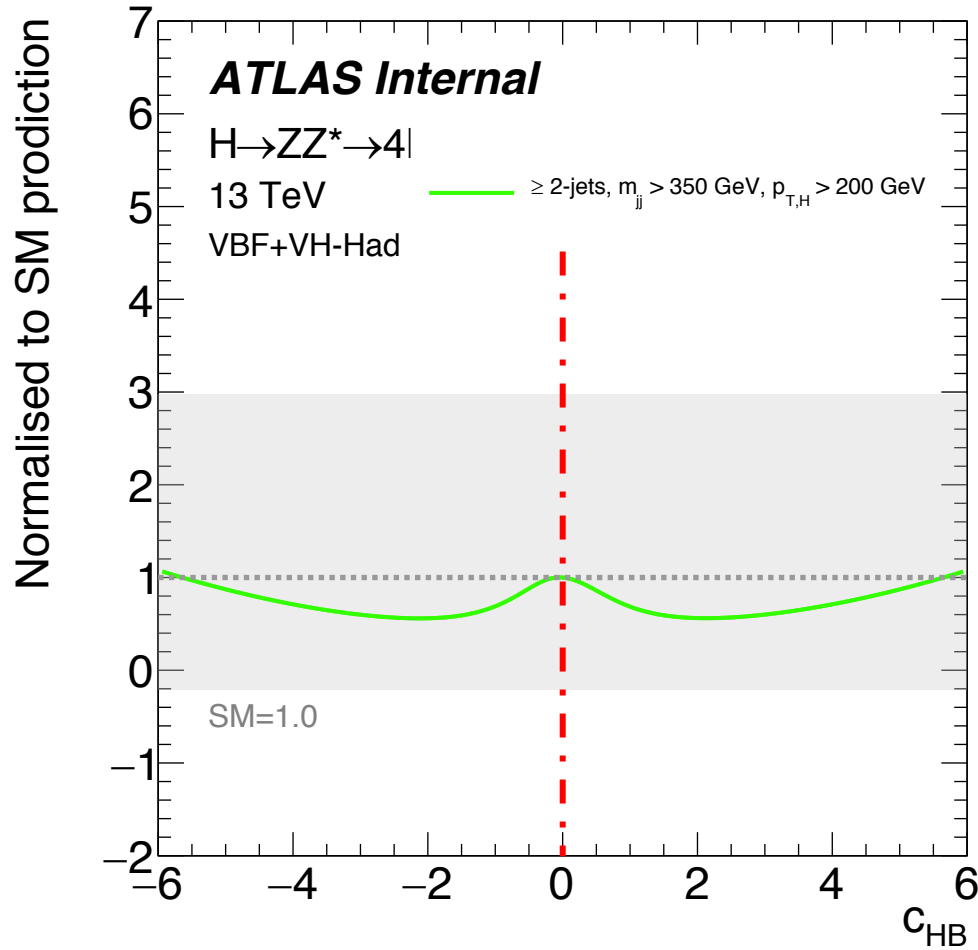
gg2H-0j-pTH-High



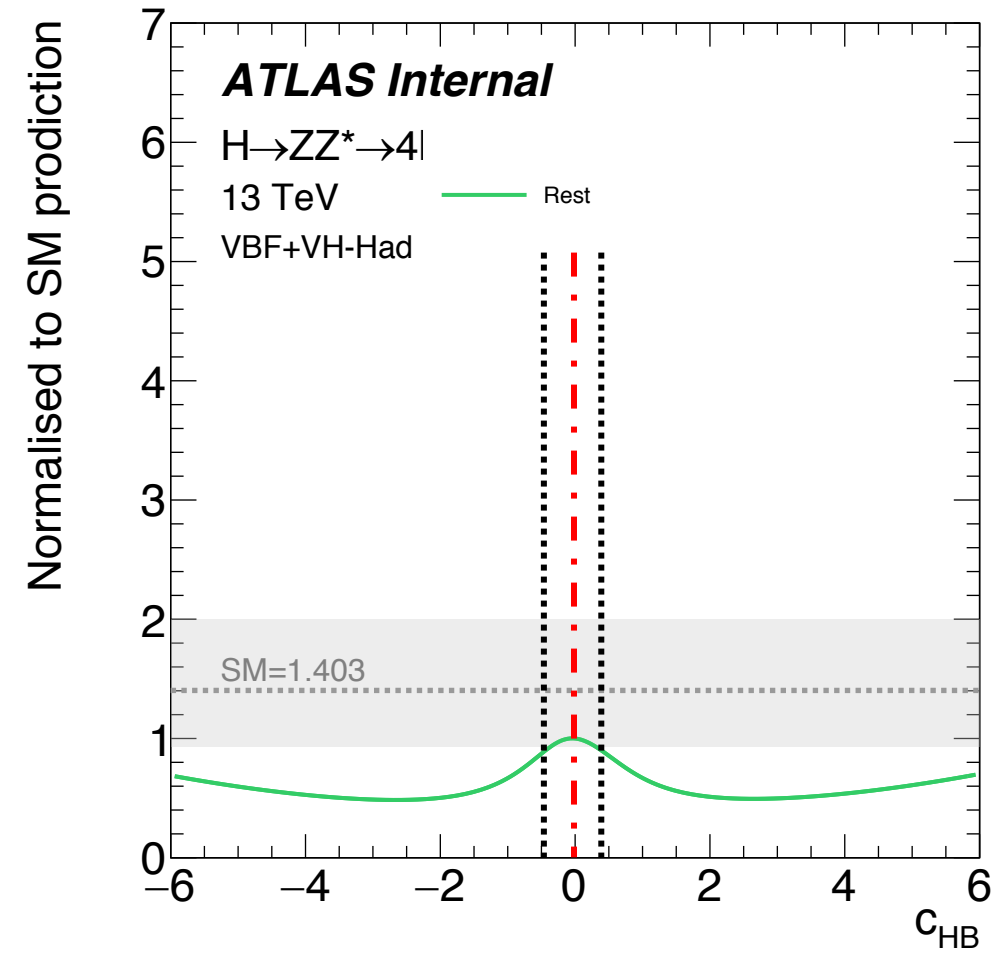
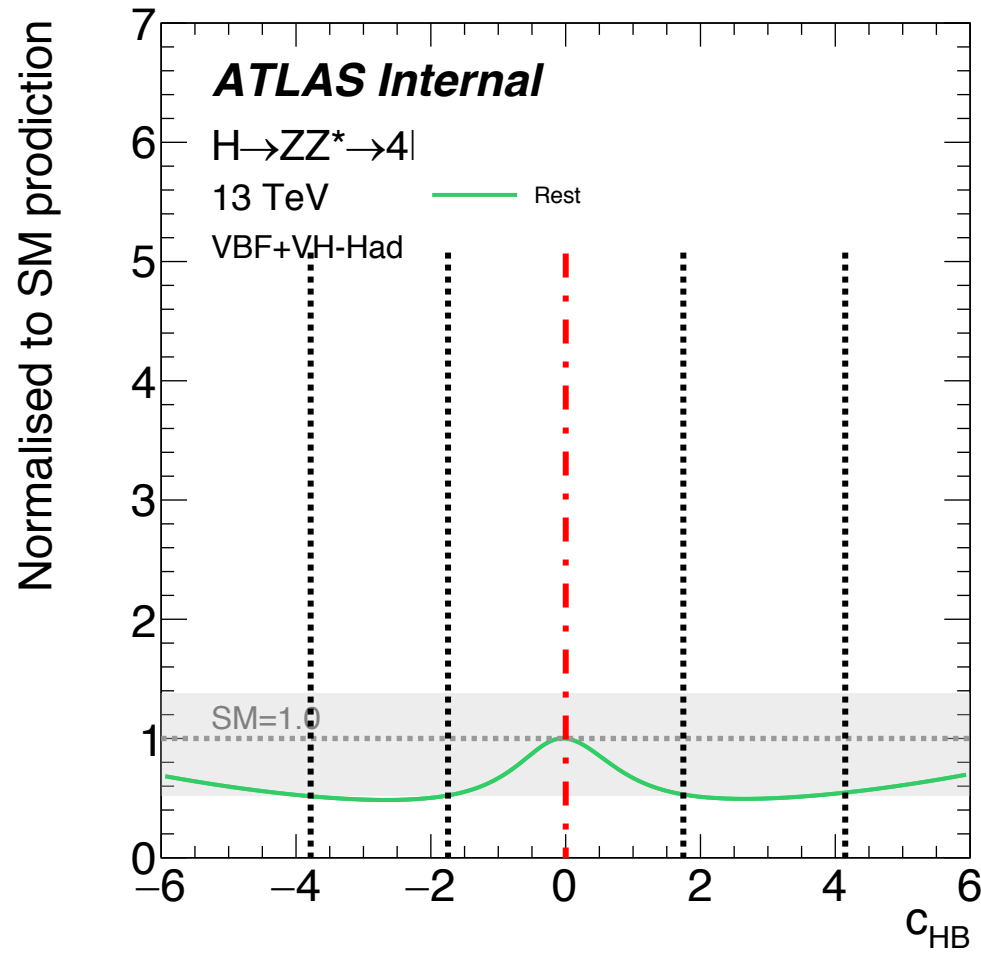
qq2Hlep



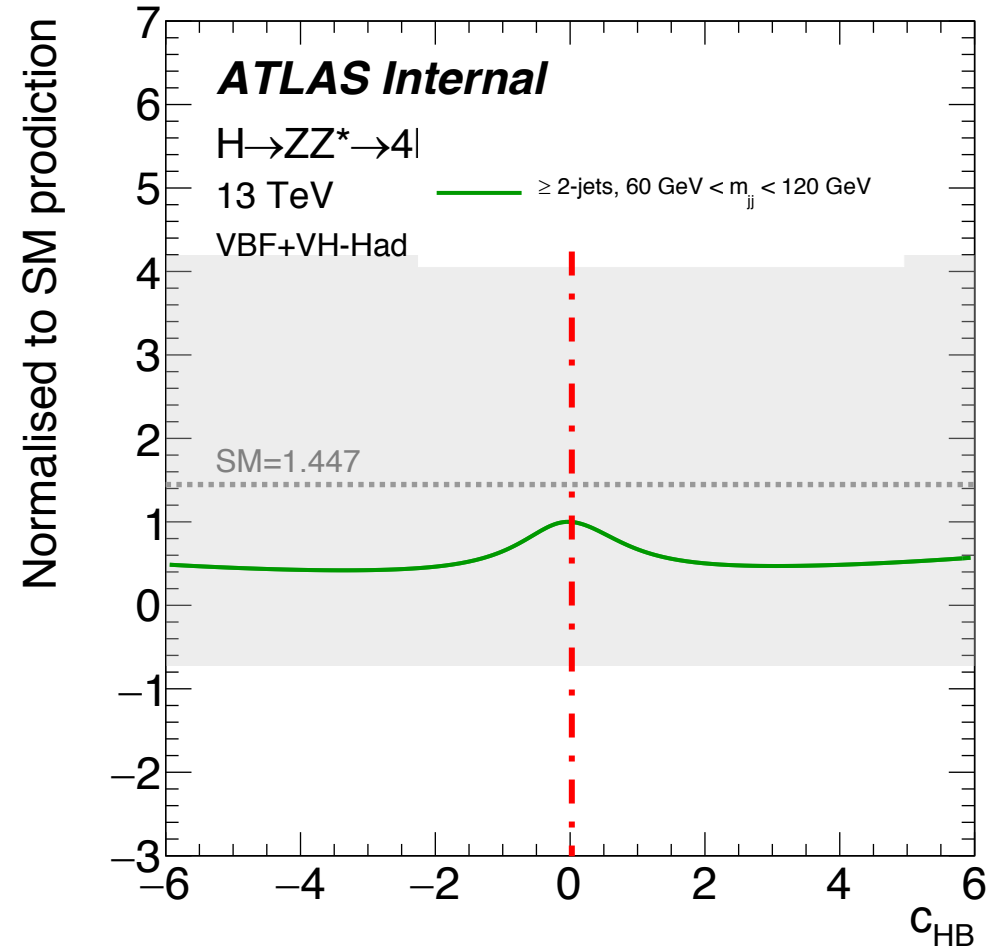
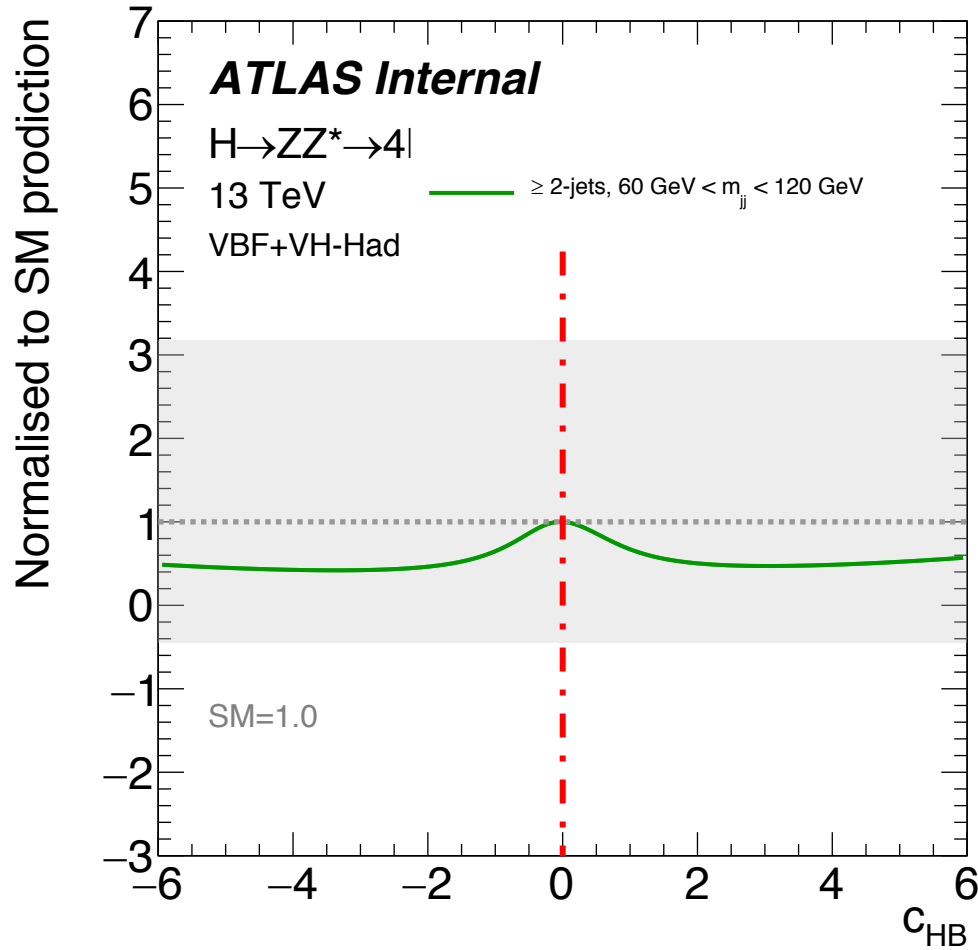
qqH2qq-pTH, mjj-High

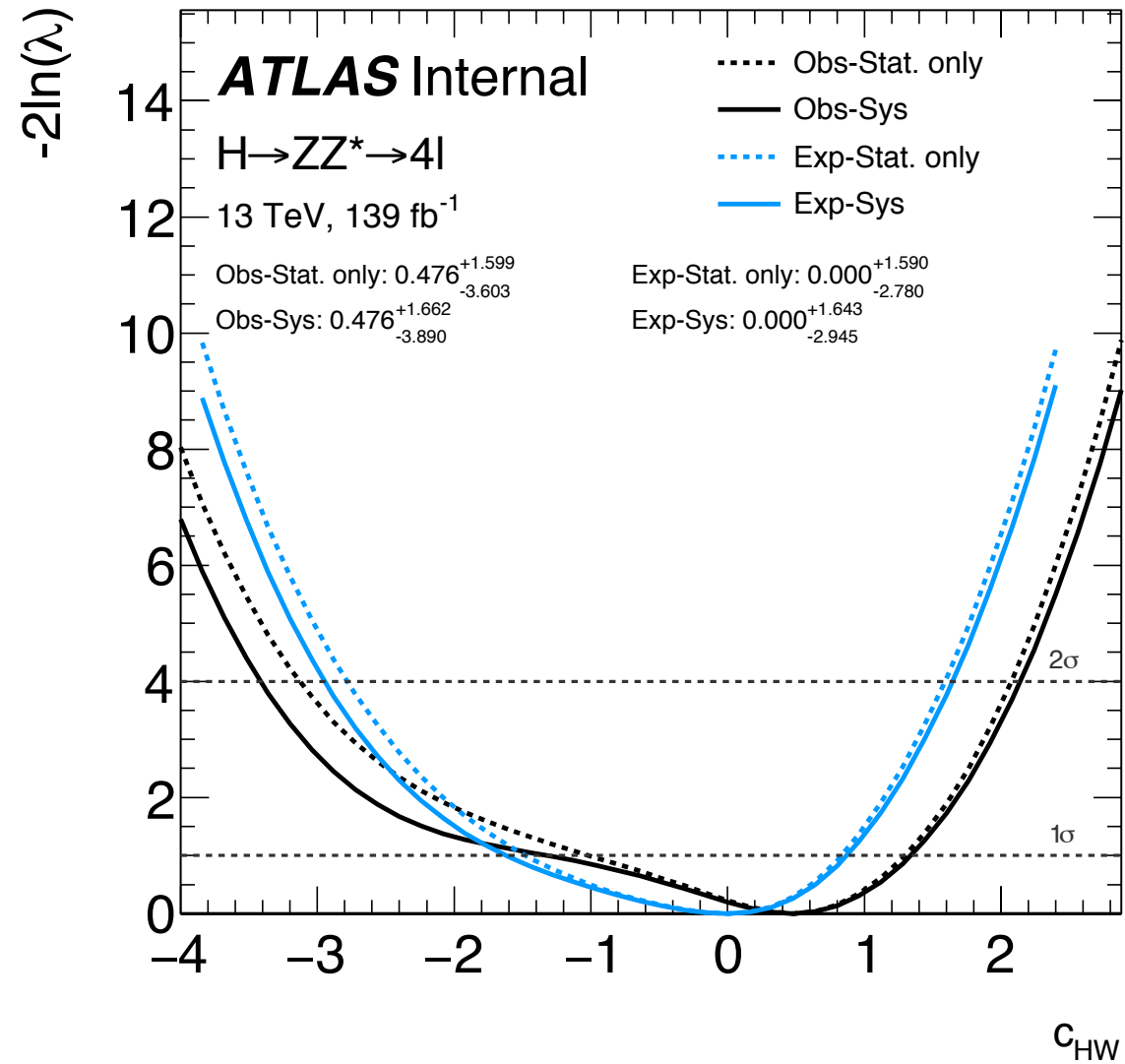


qqH2qq-Rest

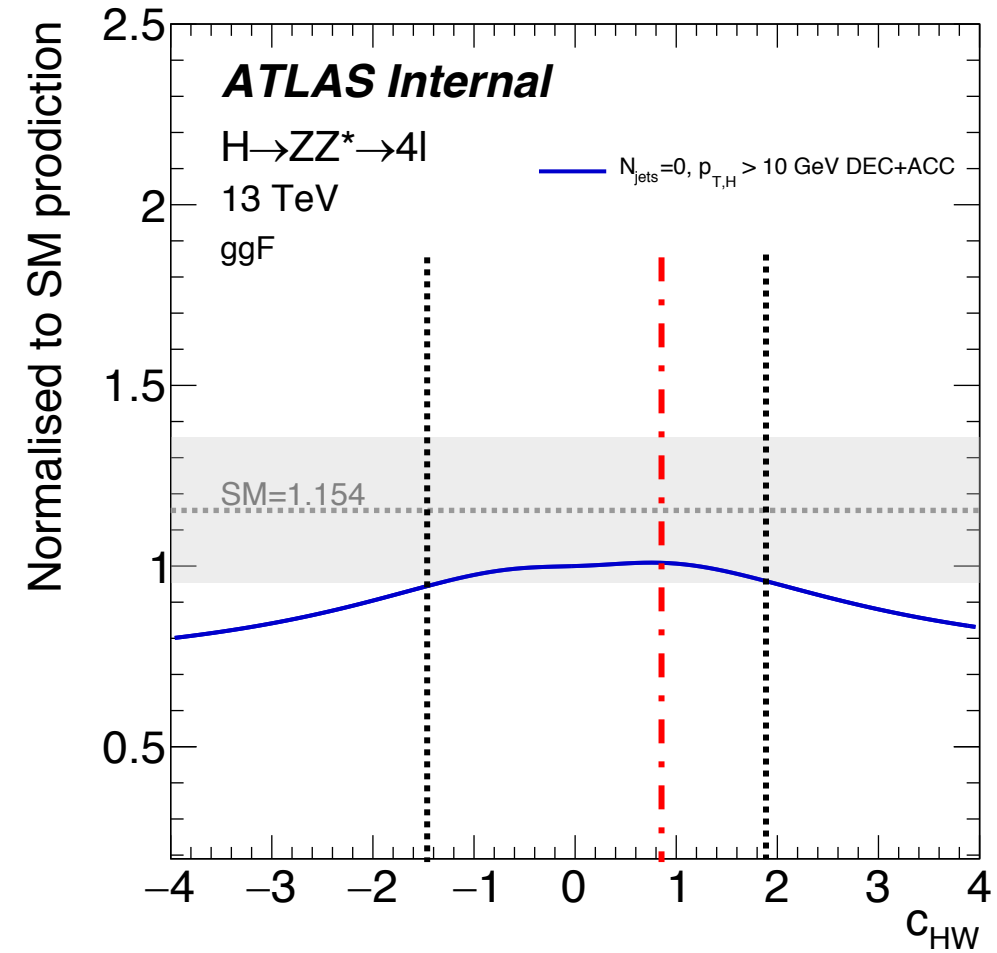
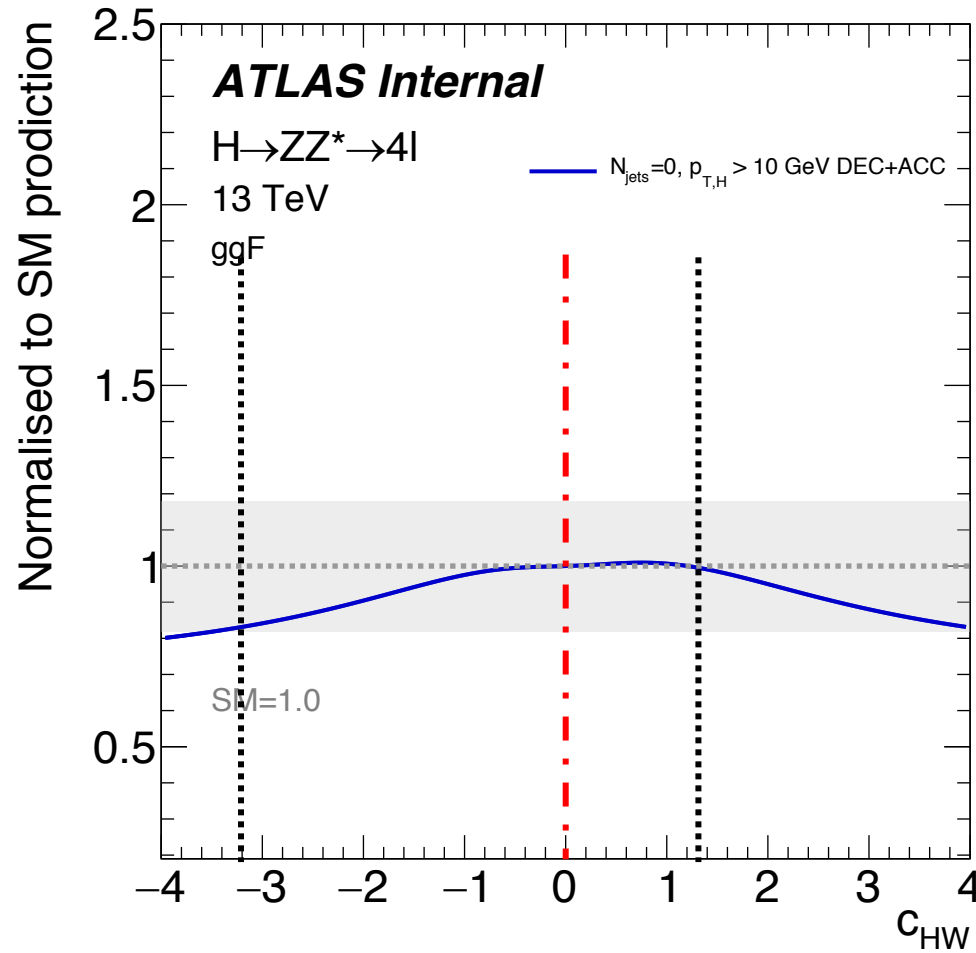


qqH2qq-VH-Like

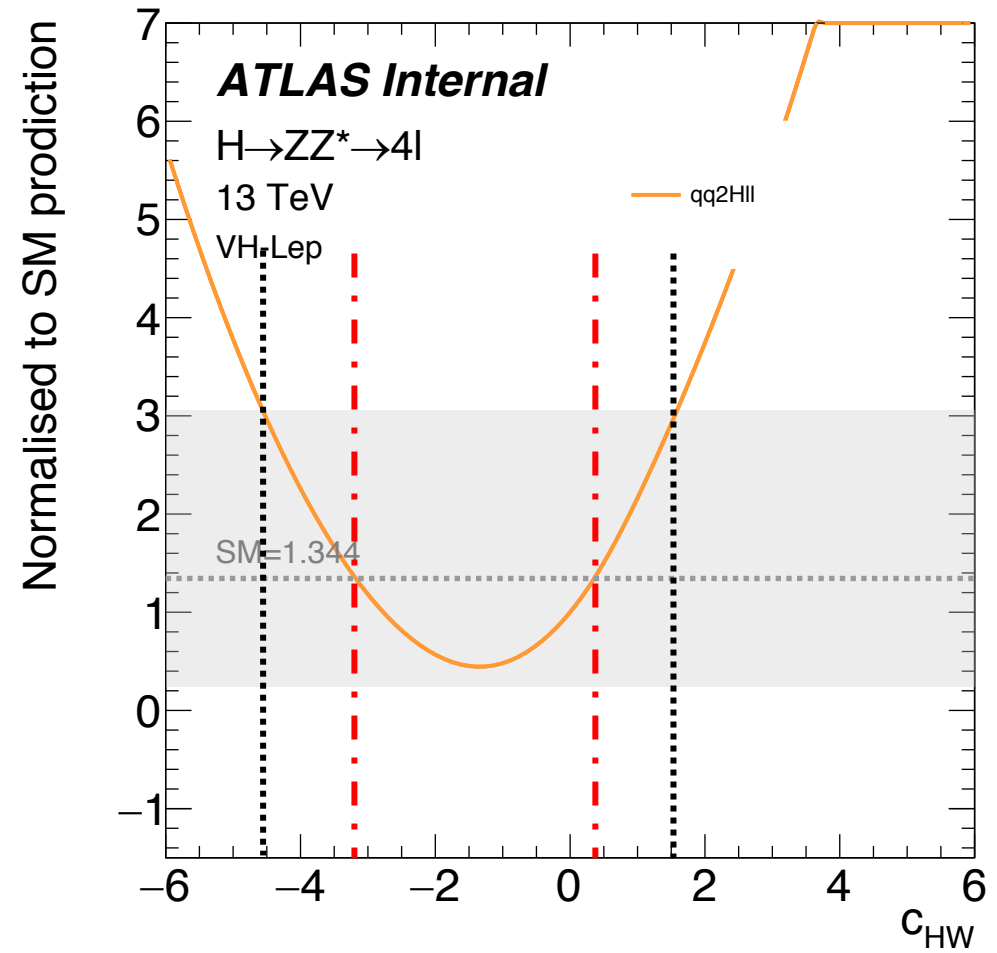
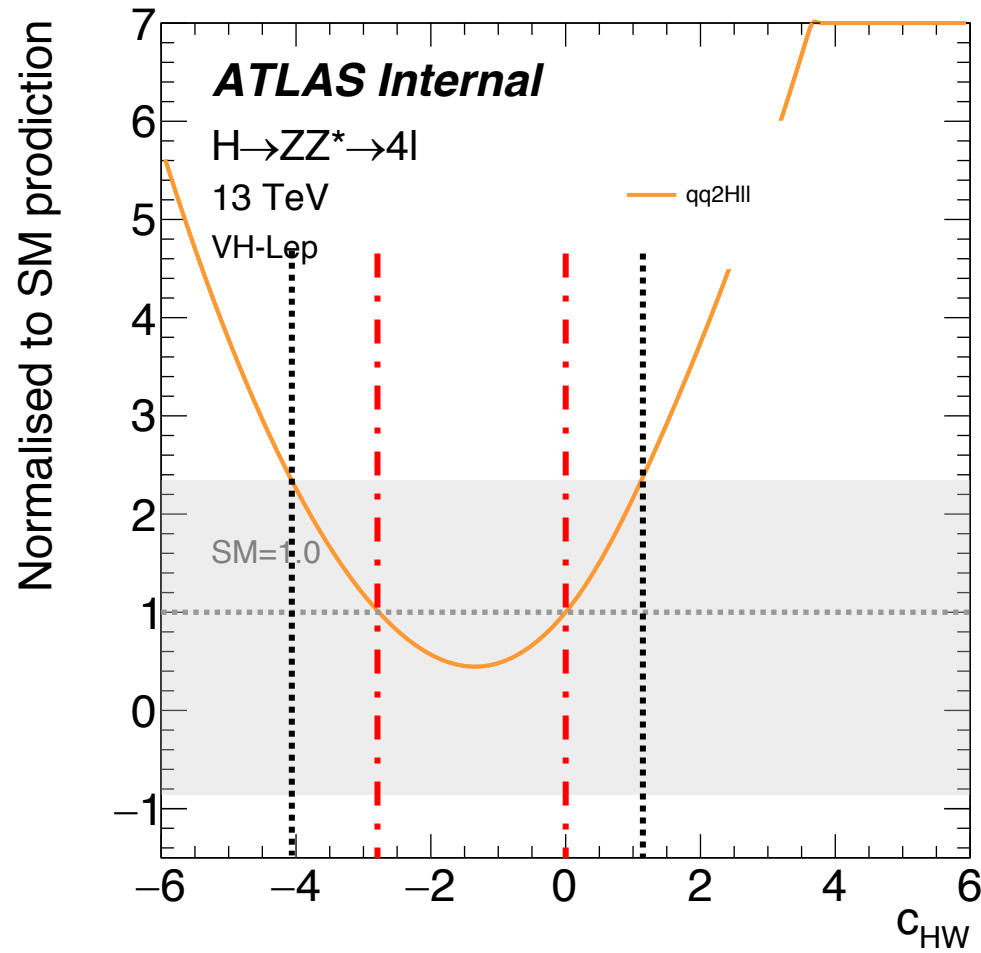




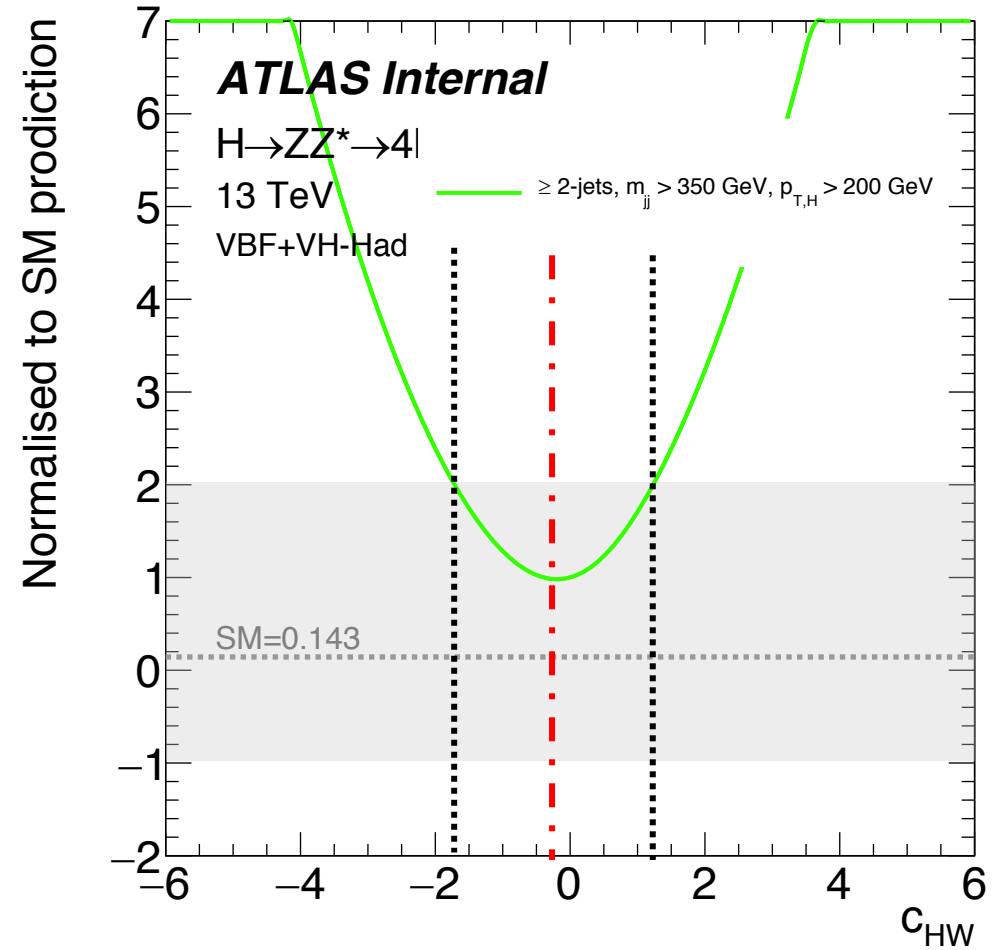
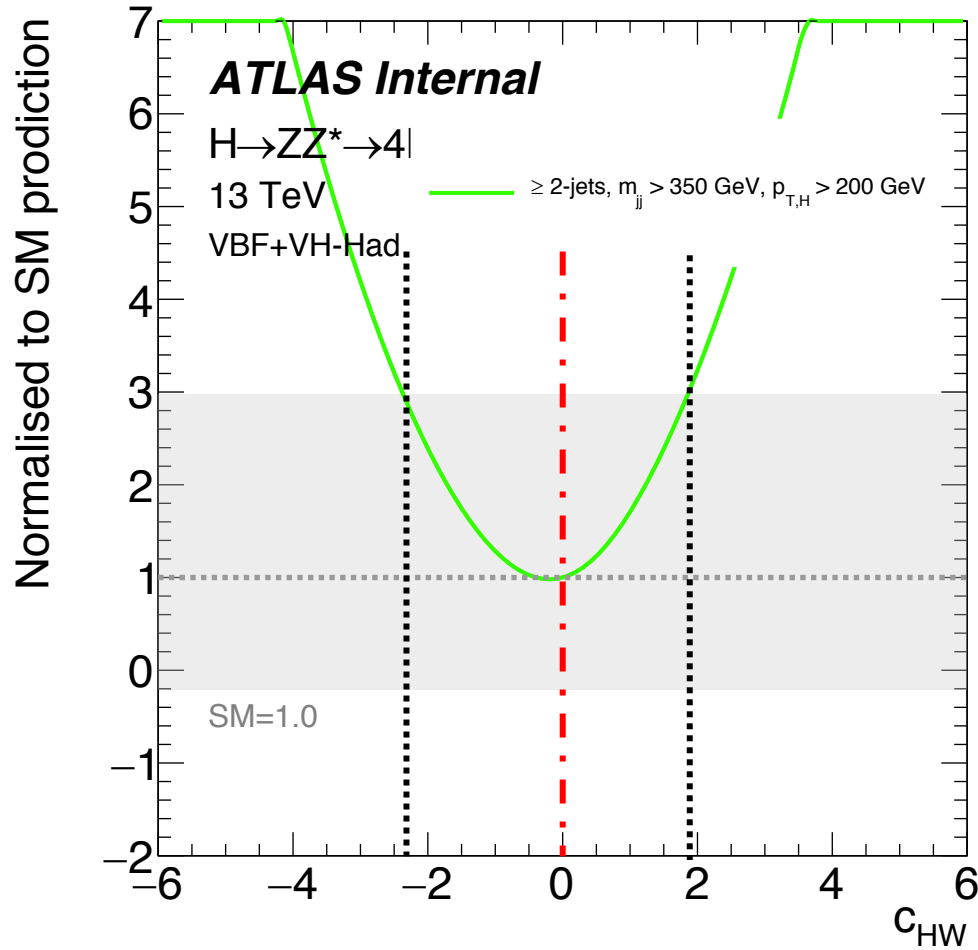
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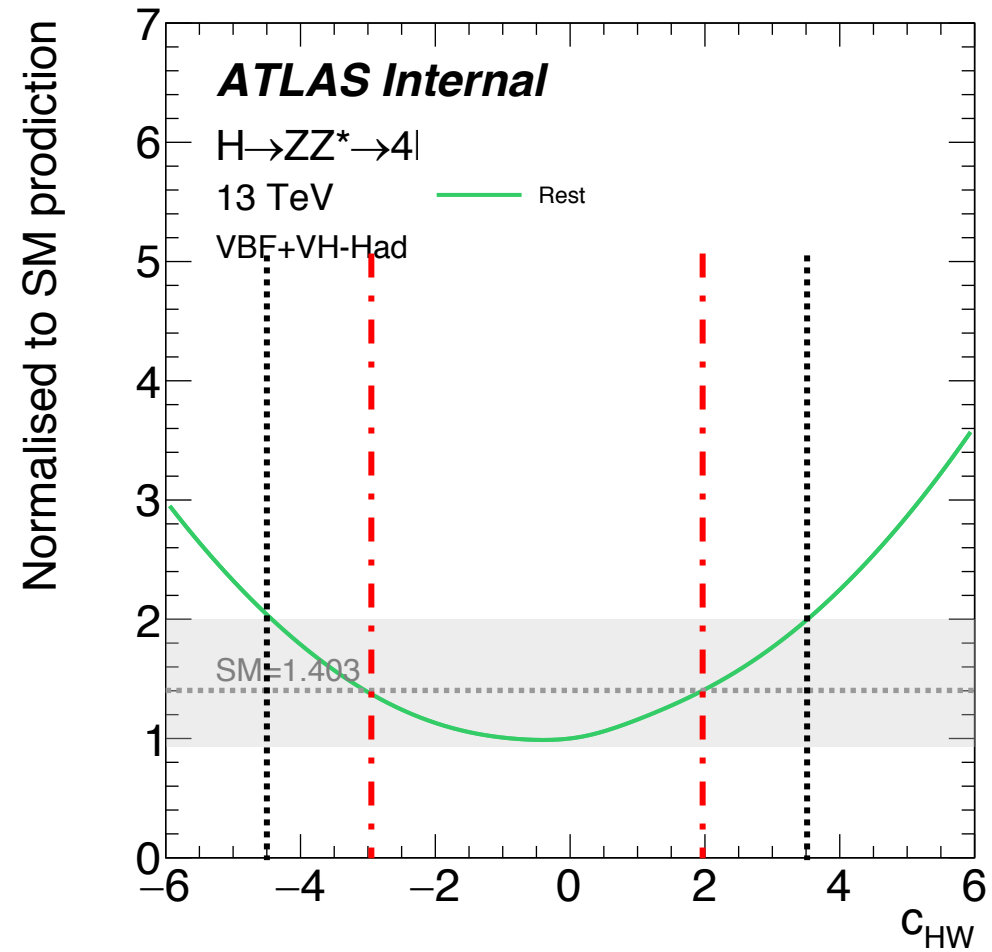
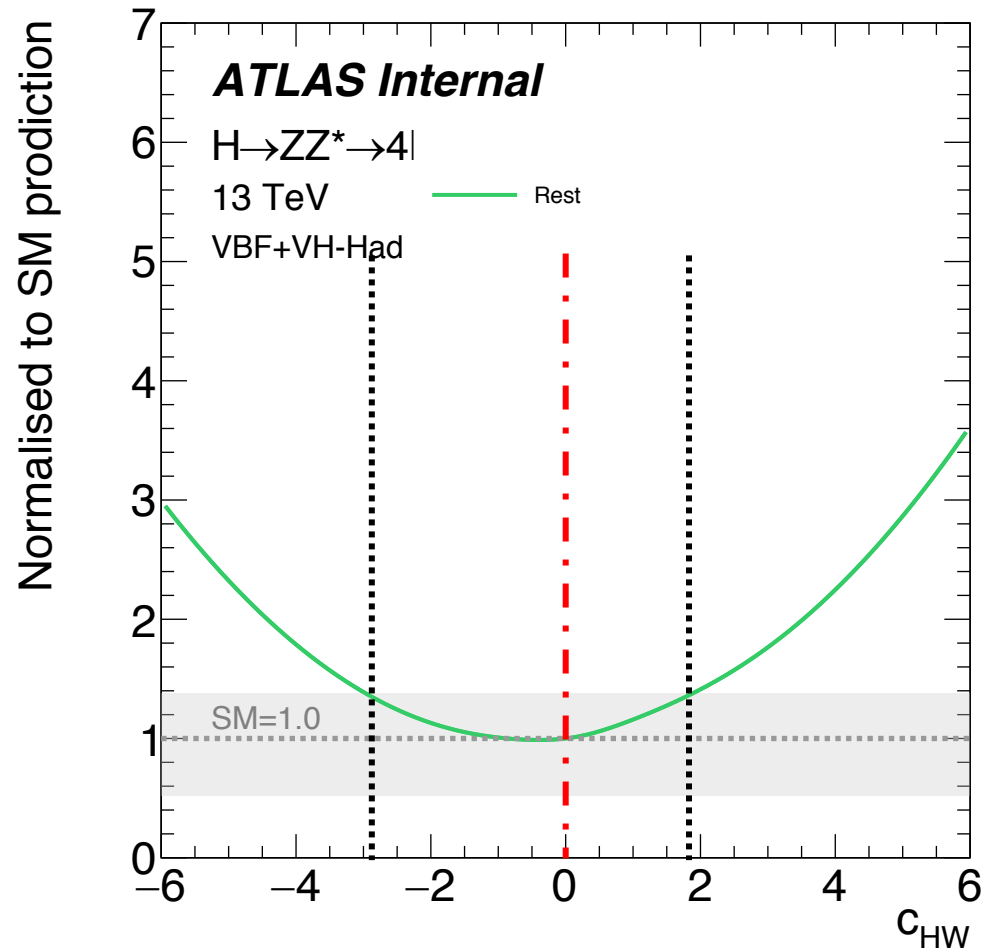
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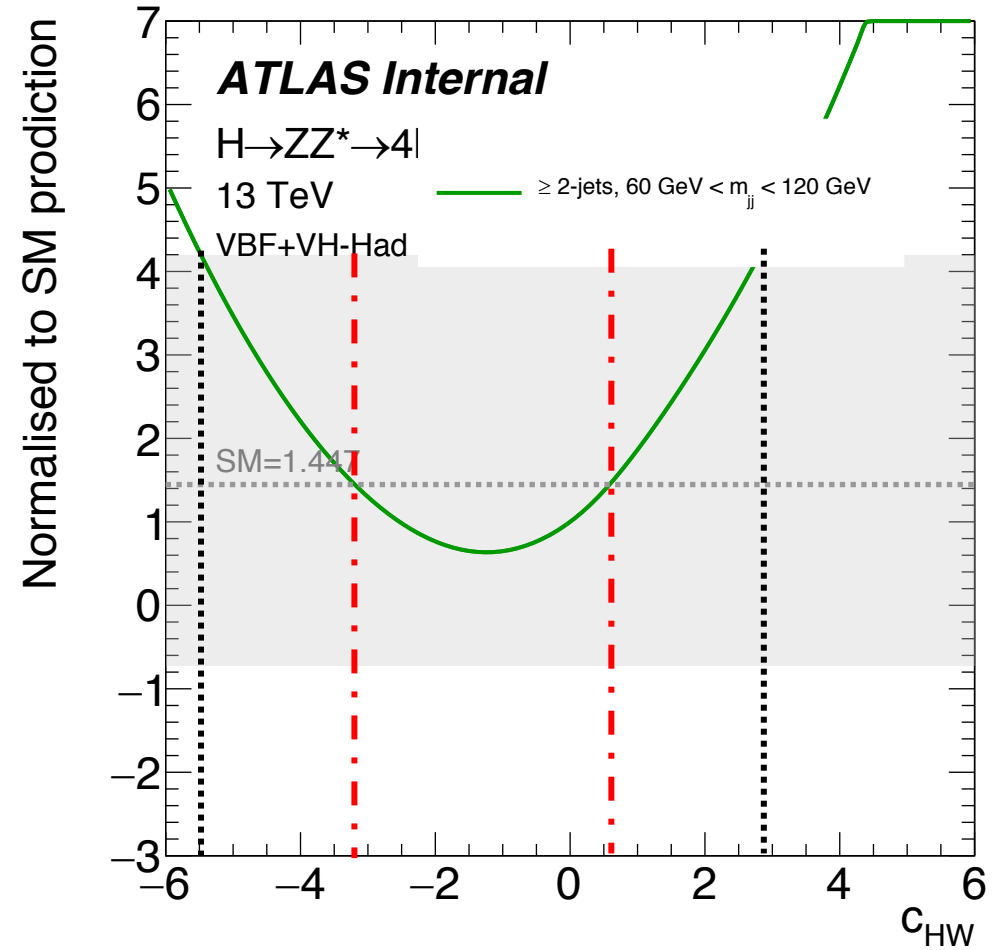
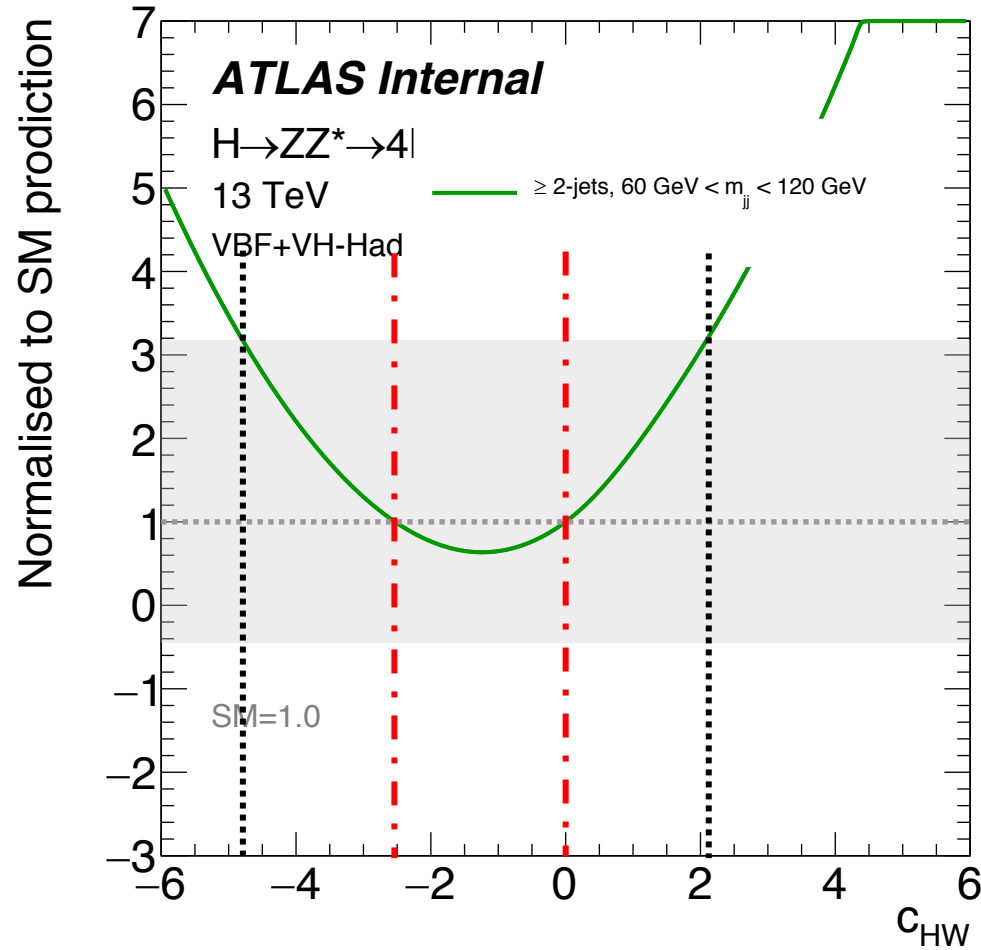
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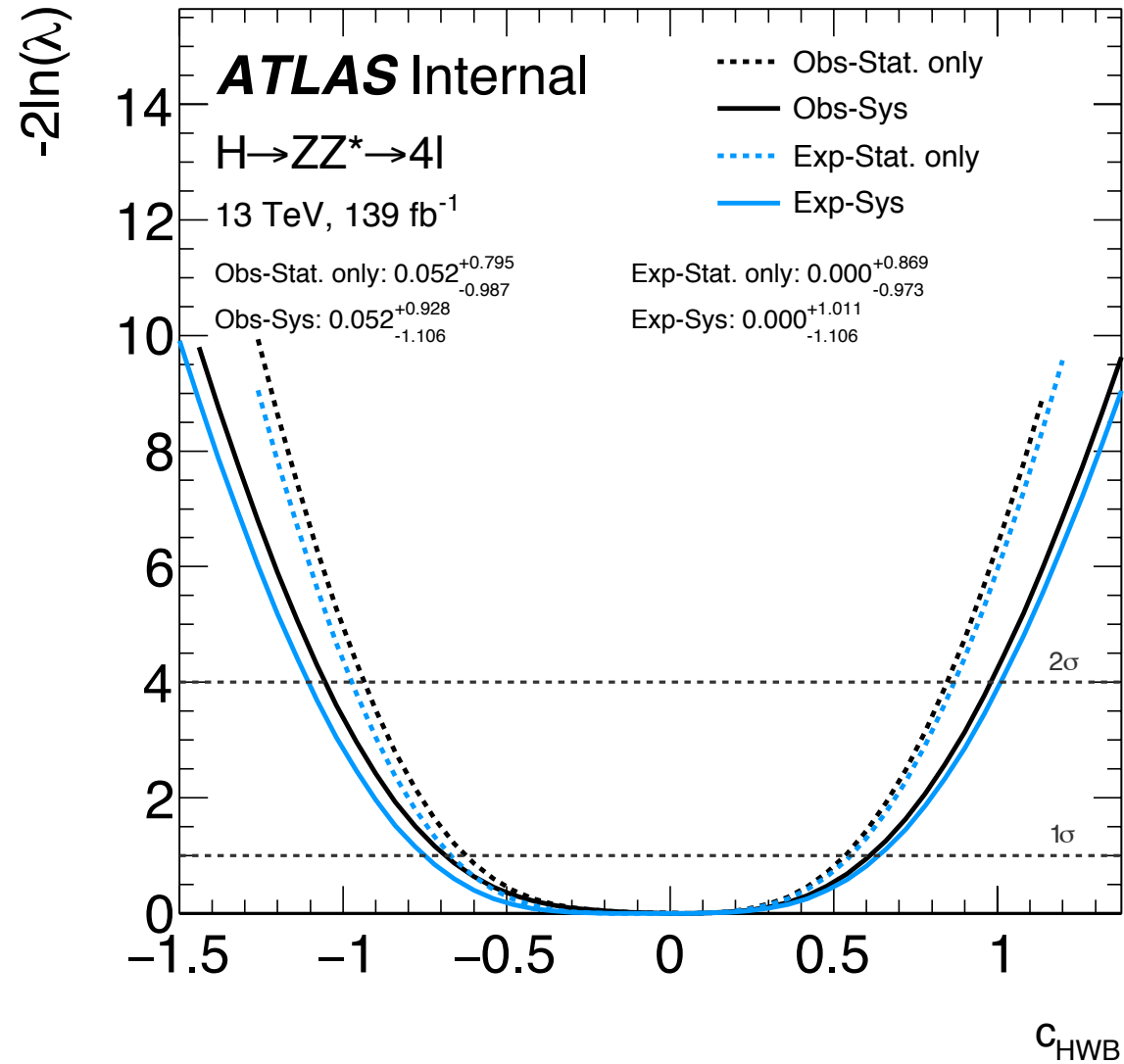


qqH2qq-Rest

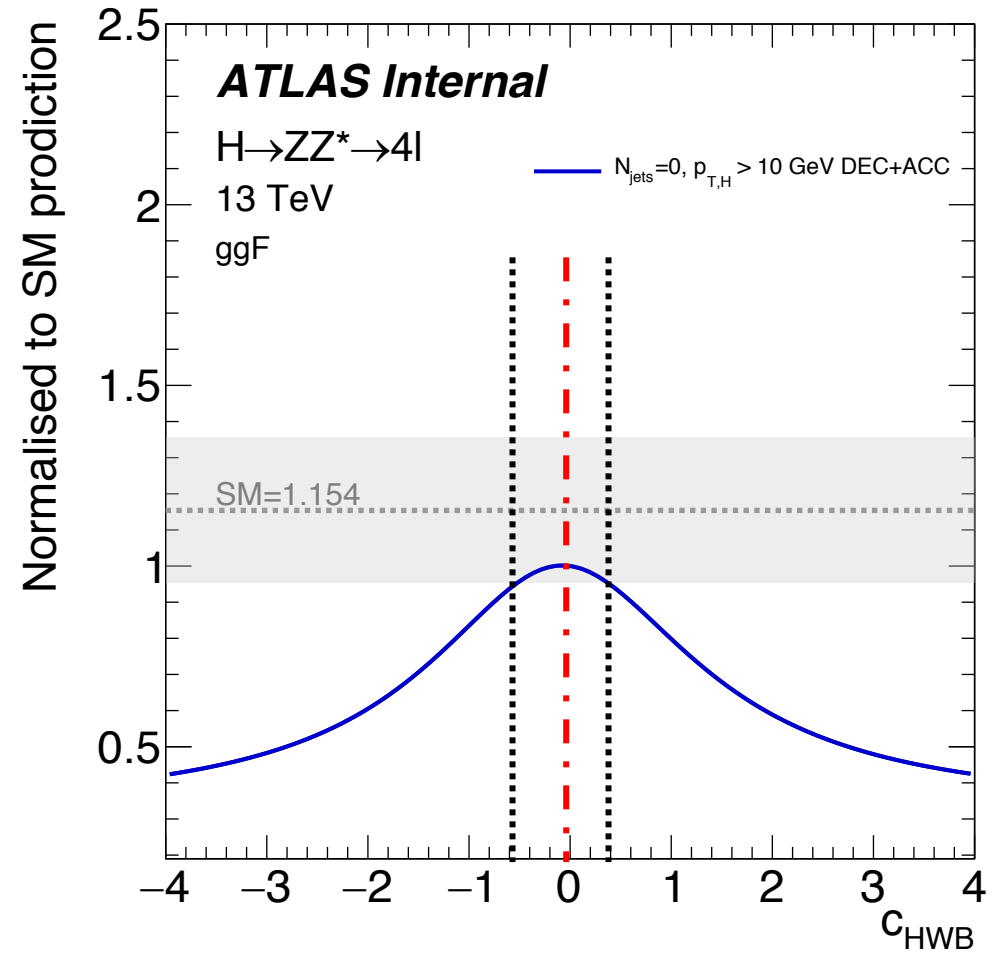
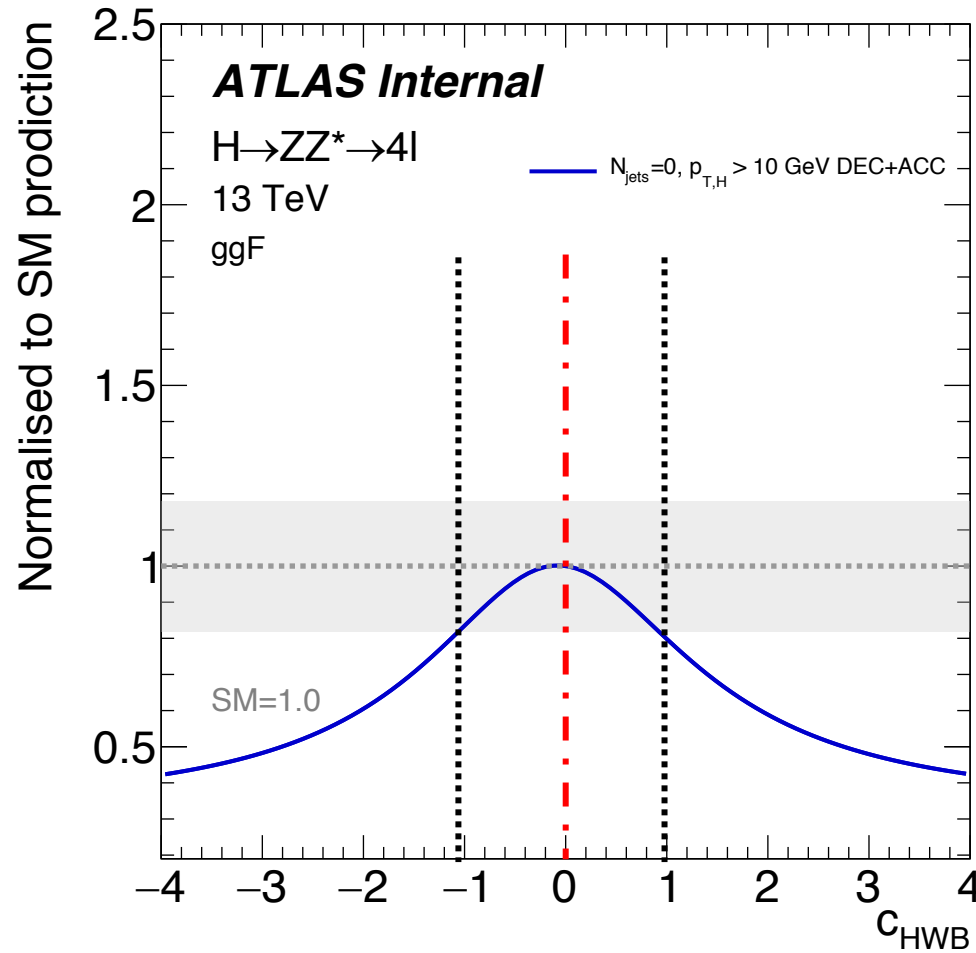


qqH2qq-VH-Like

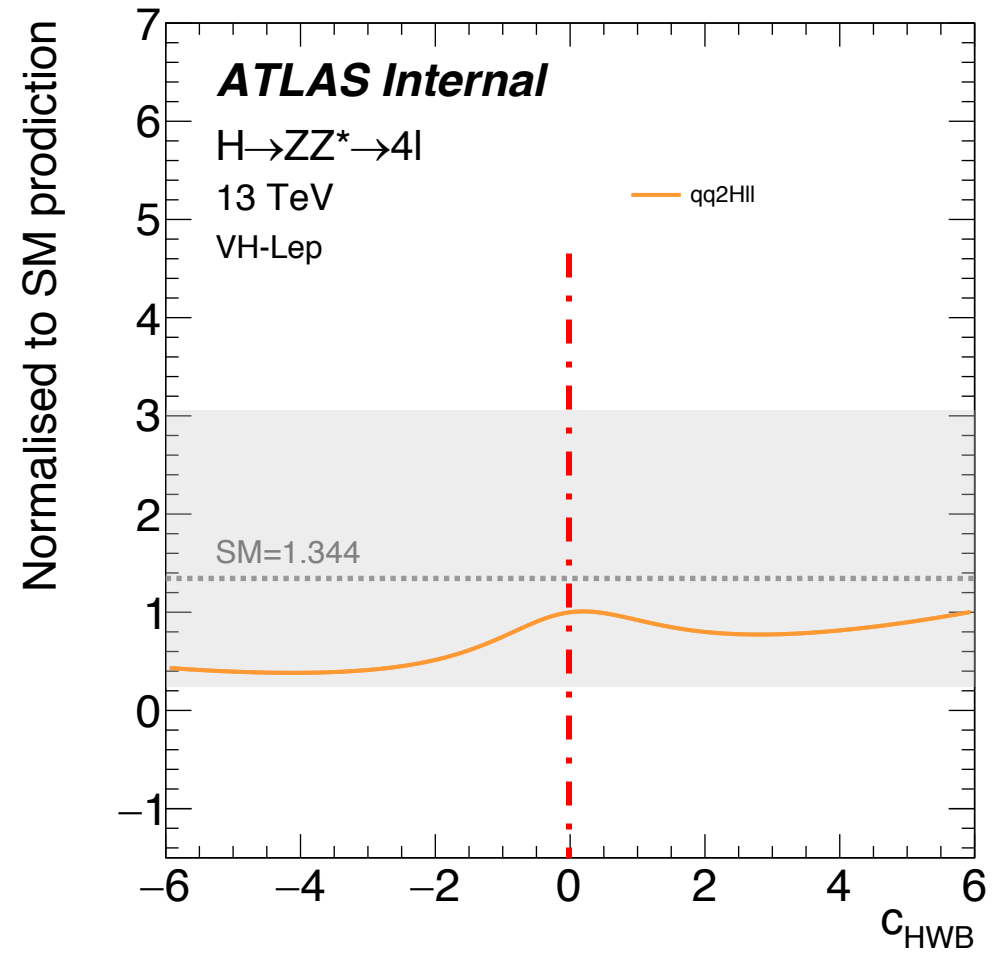
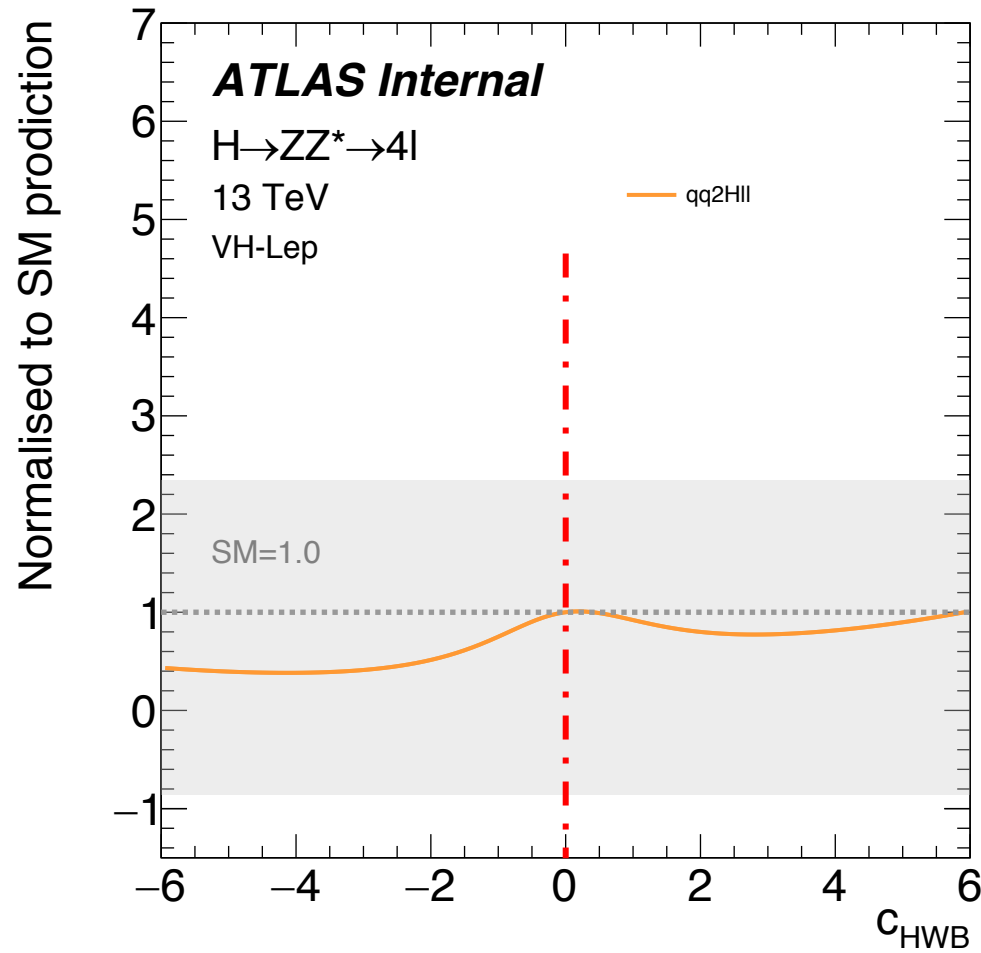




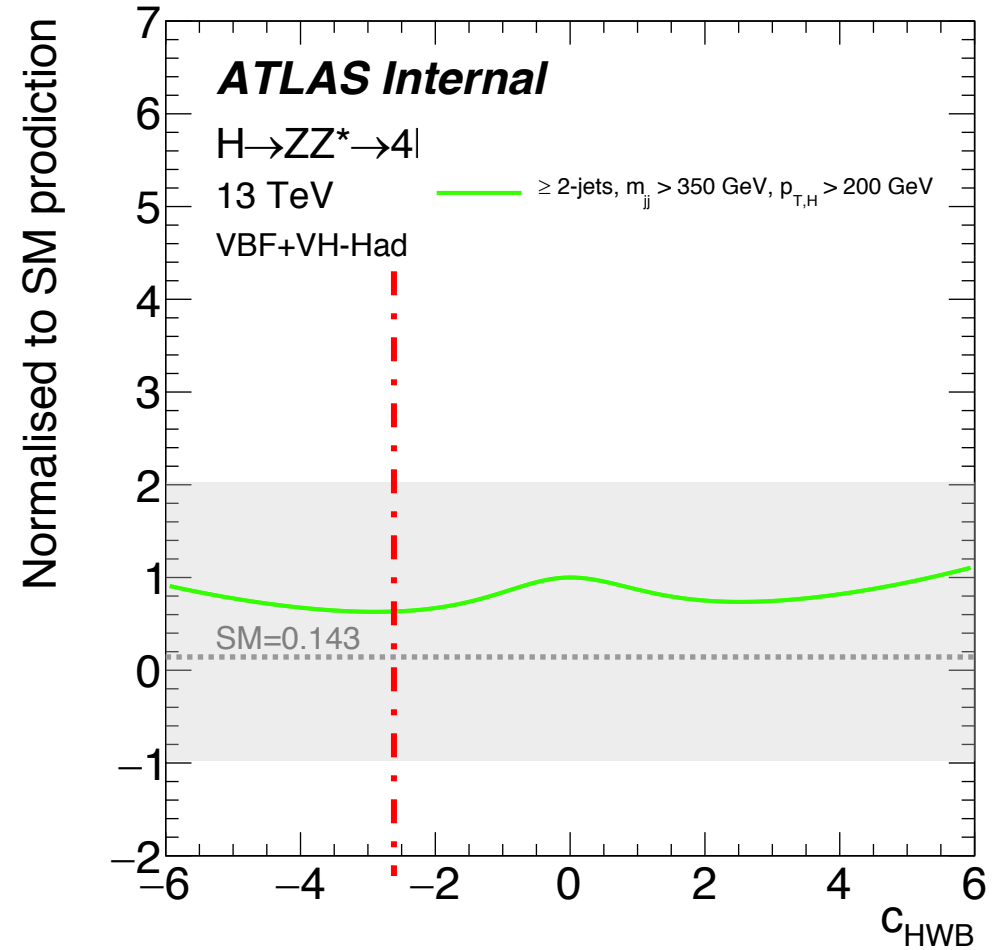
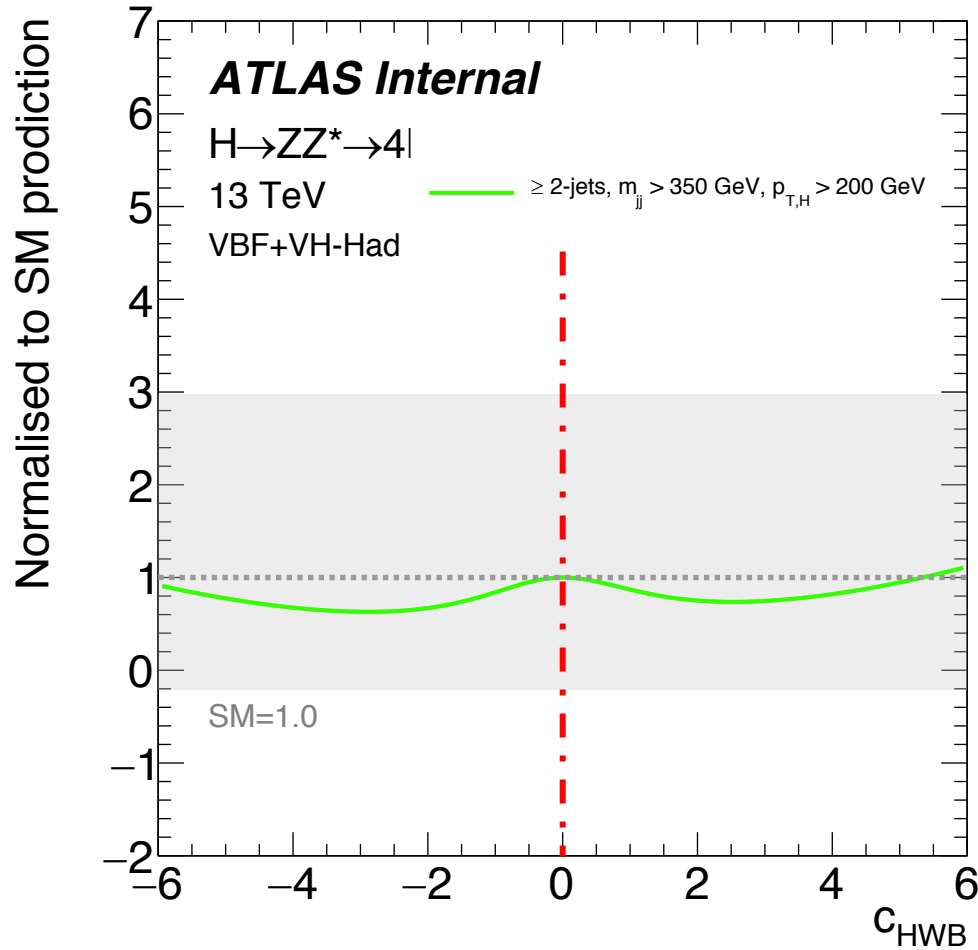
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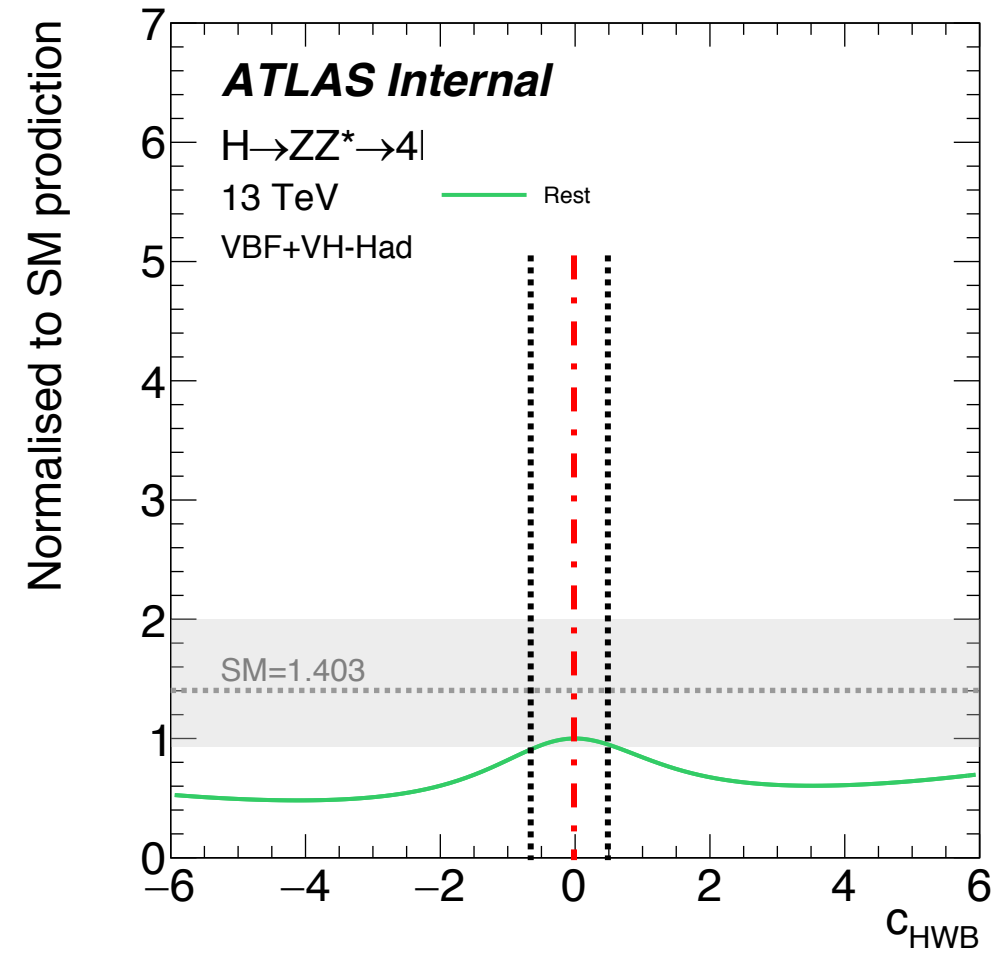
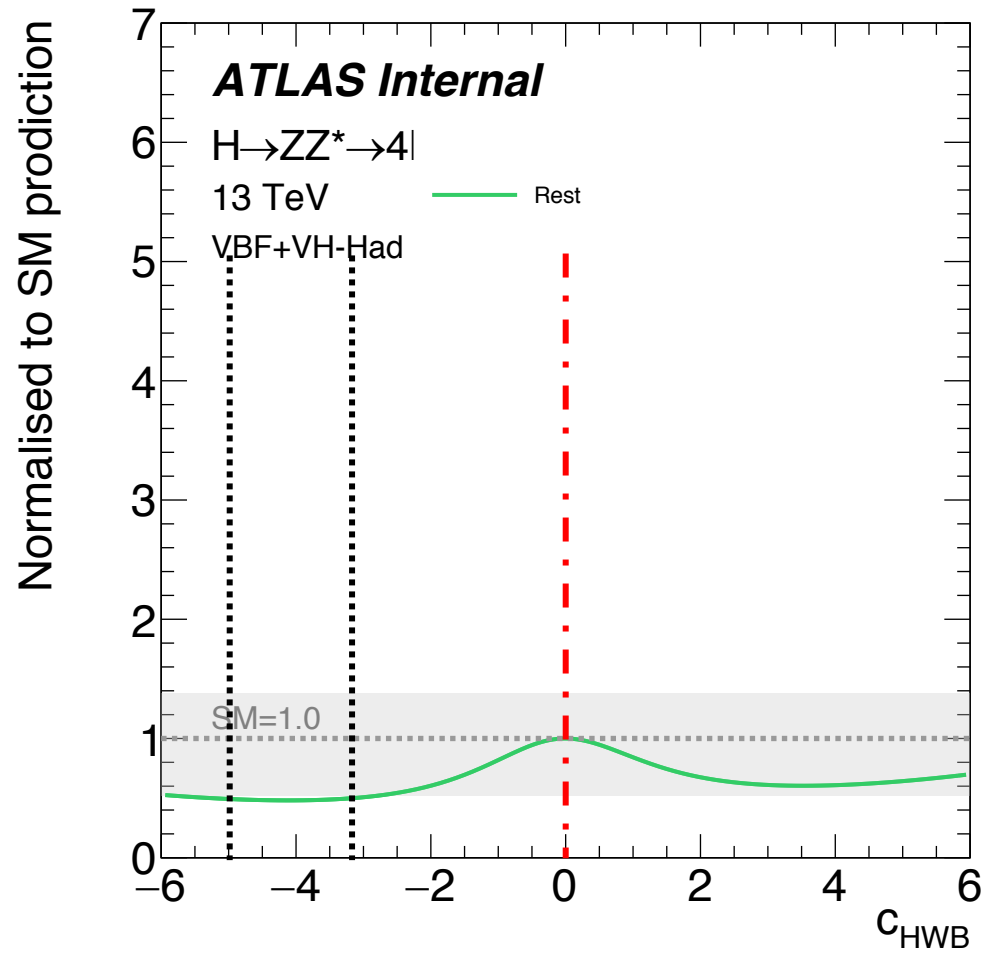
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qqH2qq-pTH, mjj-High



qqH2qq-Rest



qqH2qq-VH-Like

