



Simulation-Based Inference for Off-Shell Higgs Boson Analysis in ATLAS

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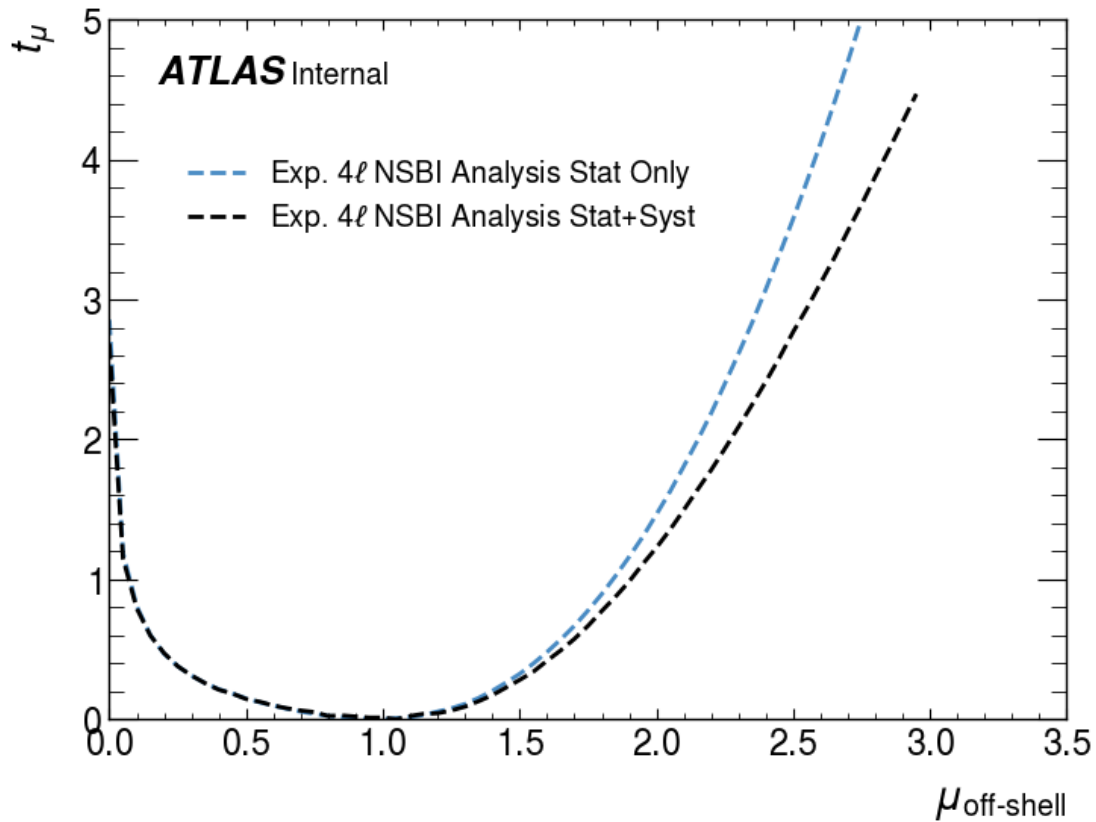
Yingjie Wei

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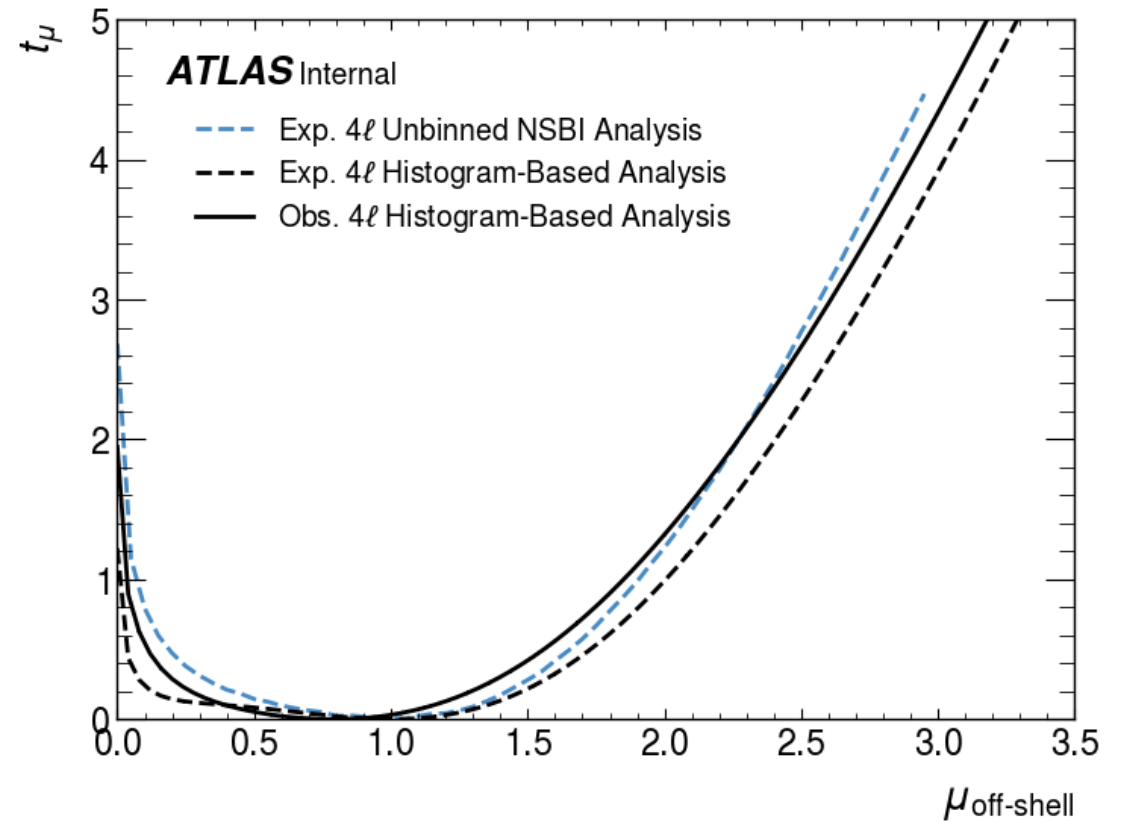


Final Paper Plots

To-do: Add the NC contours (under construction by Arnaud)



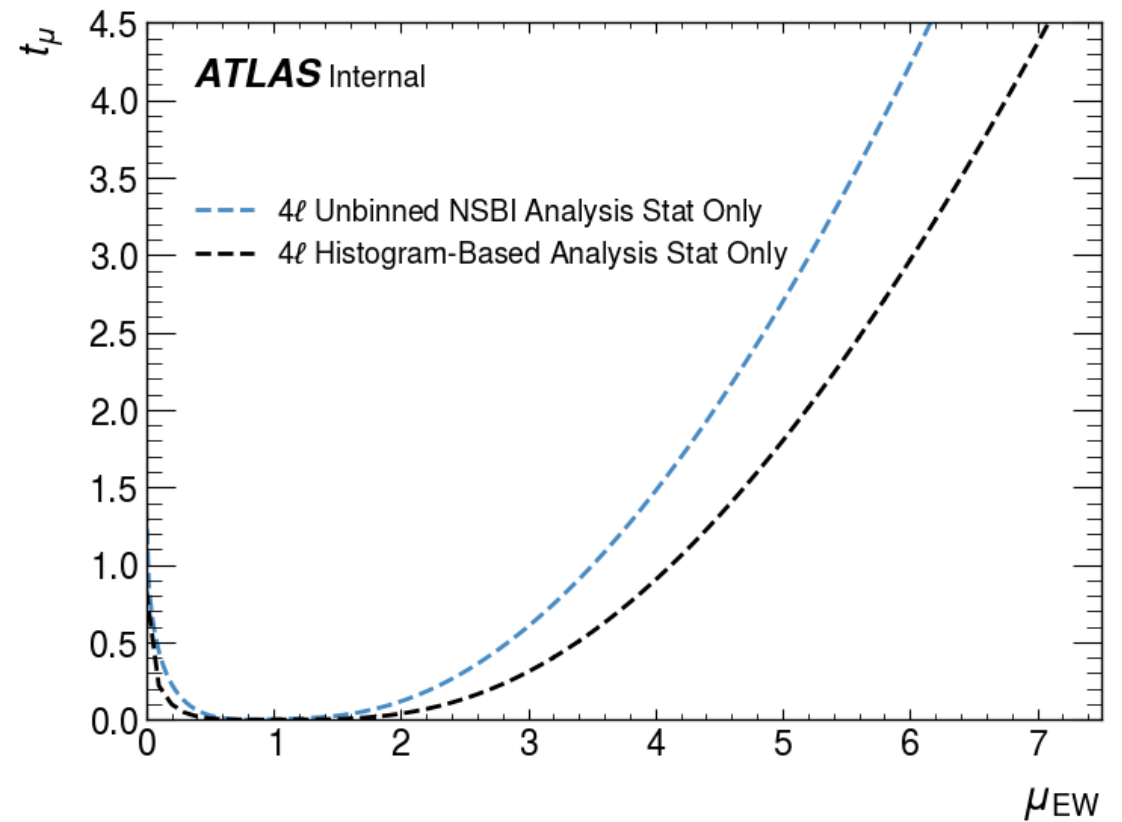
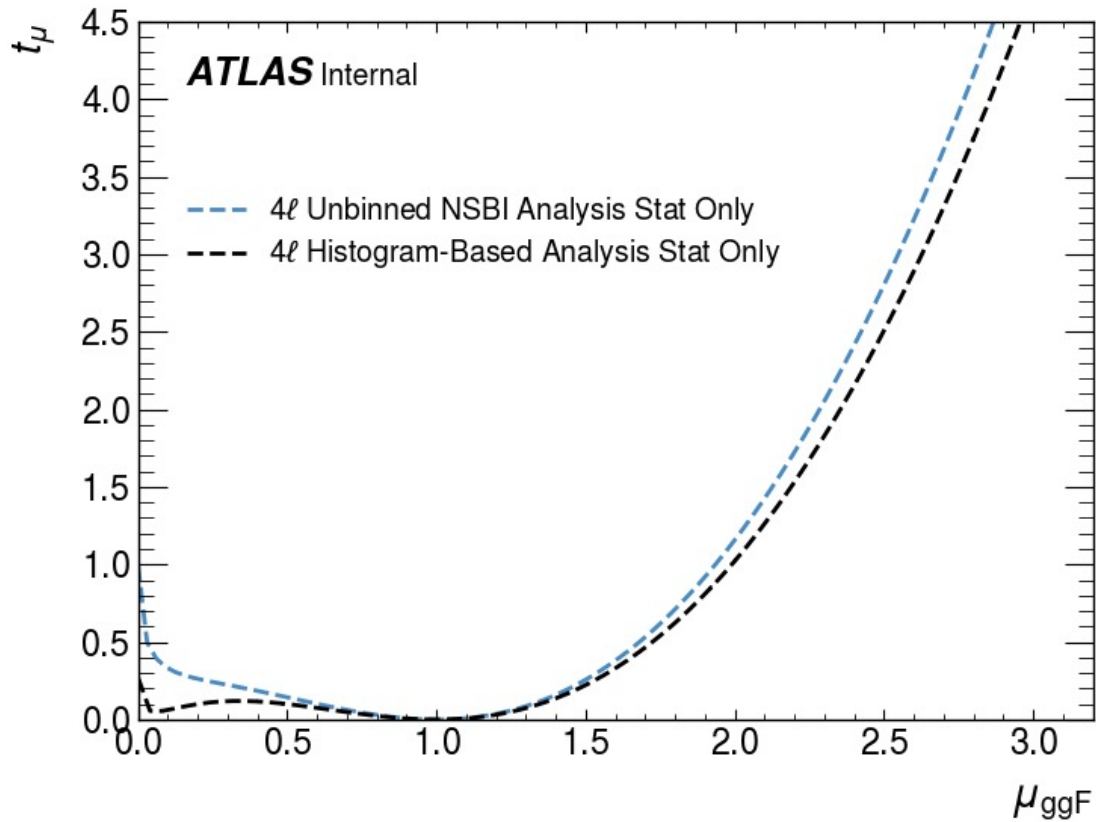
Impact from systematics
(Auxiliary plot)



Main “improvement” result

Final Paper Plots

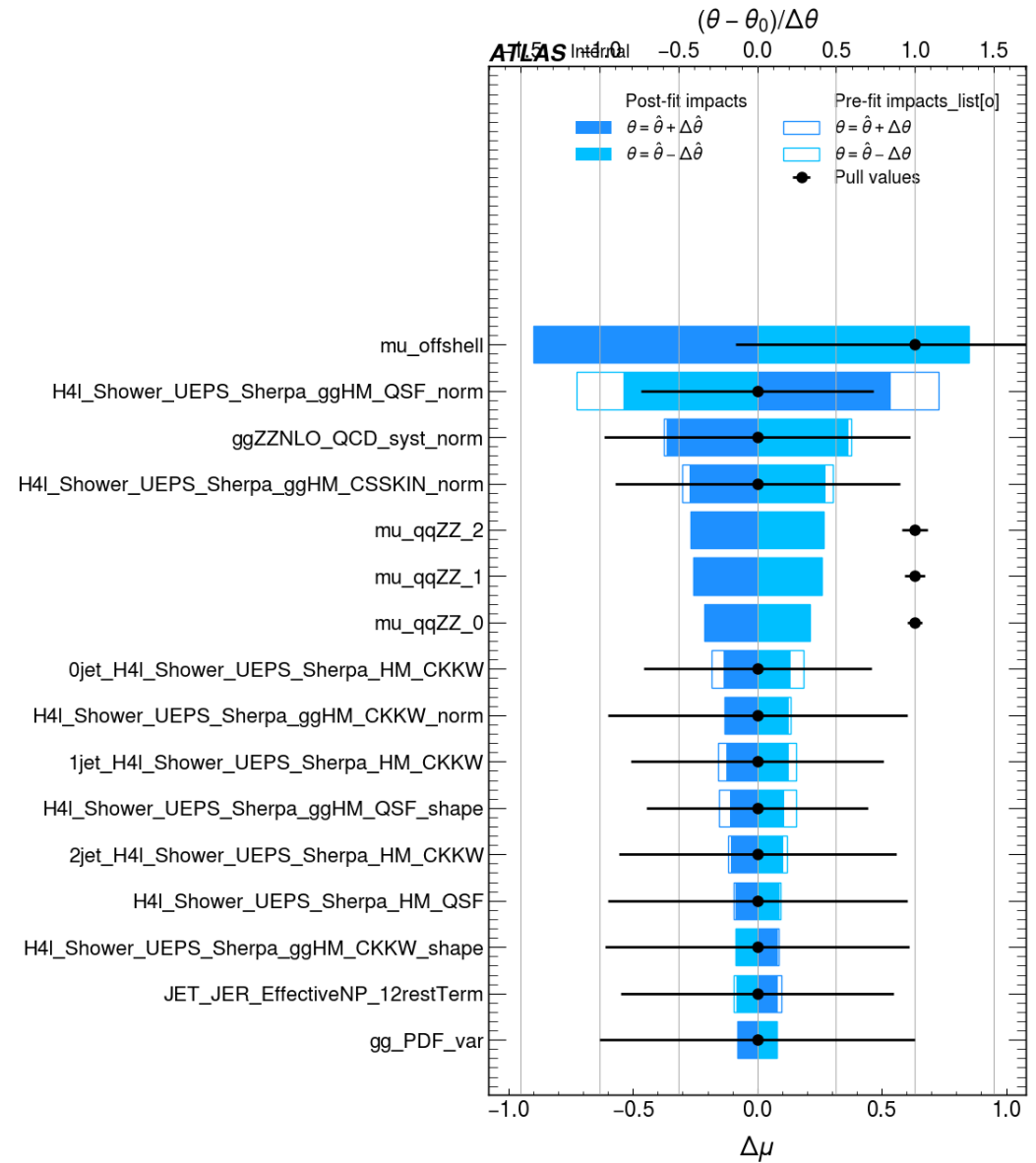
To-do: perform a stat+syst fit



Perhaps not directly shown in the paper – but quote limits

Final Paper Plots

Convert this to a table for the most impactful NPs



Ongoing tasks before unblinding

- Performing combination fits (using the full systematic model) with both the off-shell $2\ell 2\nu$ and on-shell 4ℓ channels.
- Update the Internal note with all the latest figures and results. (New CDS document to come live tomorrow)
- Prepare all the plots for the final physics paper.

In the off-shell channels, show 4ℓ -only plots to highlight improvements

But quote also $4\ell + 2\ell 2\nu$ measurements in a table as an updated measurement?

Observable	Hypotheses	Observed (expected) Result at 68% CL.	Observed (expected) Limit at 95% CL.
$\mu_{\text{off-shell}}^{\text{ggF}}$	-	1.0 ± 0.1 (1.0 ± 0.1)	2.0 (1.0)
$\mu_{\text{off-shell}}^{\text{EW}}$	-	1.0 ± 0.1 (1.0 ± 0.1)	2.0 (1.0)
$\mu_{\text{off-shell}}$	$\mu_{\text{off-shell}}^{\text{ggF}} = \mu_{\text{off-shell}}^{\text{EW}}$	1.0 ± 0.1 (1.0 ± 0.1)	2.0 (1.0)
R^{ggF}	$R^{\text{EW}} = 1$ $\mu_{\text{ZZ}} \text{ profiled}$	1.0 ± 0.1 (1.0 ± 0.1)	2.0 (1.0)
R^{EW}	$R^{\text{ggF}} = 1$ $\mu_{\text{ZZ}} \text{ profiled}$	1.0 ± 0.1 (1.0 ± 0.1)	2.0 (1.0)
Γ_H	$\mu_{\text{off-shell}}^{\text{ggF}} = \mu_{\text{off-shell}}^{\text{EW}}$ $\mu_{\text{ZZ}} \text{ profiled}$	1.0 ± 0.1 (1.0 ± 0.1)	2.0 (1.0)
Γ_H	$\mu_{\text{off-shell}}^{\text{ggF}} = \mu_{\text{off-shell}}^{\text{EW}}$ $\mu_{\text{ZZ}} = 1$	1.0 ± 0.1 (1.0 ± 0.1)	2.0 (1.0)

Table 6: Caption