



Weekly report

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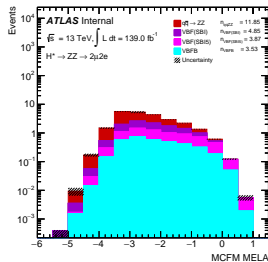
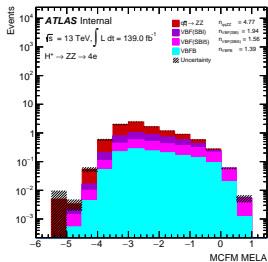
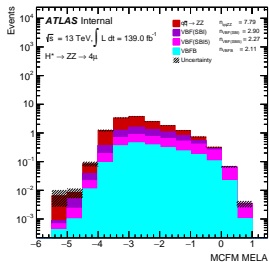
Off-shell couplings measurements: 4ℓ channel

New official samples for the VBF production

- The official samples are finally ready!
- So now we will be using MELA as observable.
- Show kinematic distribution at the SR; only for VBF related samples;
- And some plots in the CR for $m_{4\ell} [130, 220]$ GeV.
- Will be studying the fit at SR with 13 bins in MELA.
- And the fit with SR+CR, see next slides.

Off-shell couplings measurements: 4ℓ channel

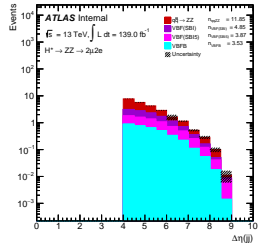
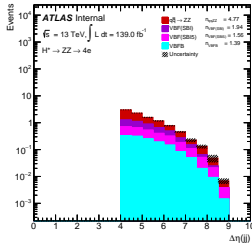
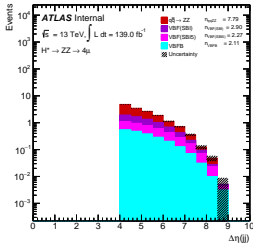
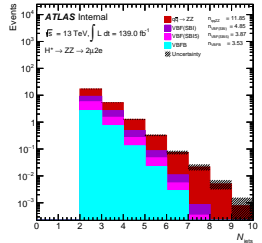
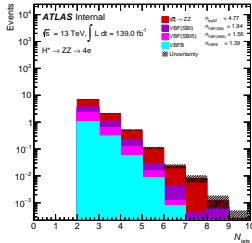
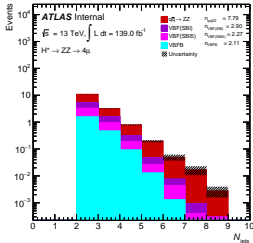
Kinematic distribution on the SR



- $220 < m_{4\ell} < 2000 \text{ GeV}, N_{\text{jets}} \geq 2, \Delta\eta(jj) > 4.0$
- Divide MELA into 13 bins for each channel — namely 4μ , $4e$ and $2\mu 2e$.

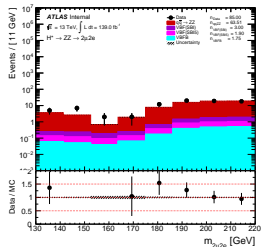
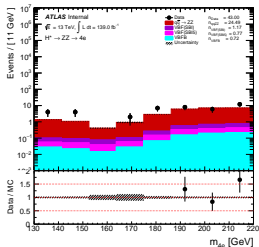
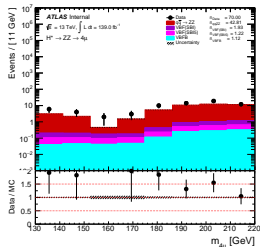
Off-shell couplings measurements: 4ℓ channel

Kinematic distribution on the SR



Off-shell couplings measurements: 4ℓ channel

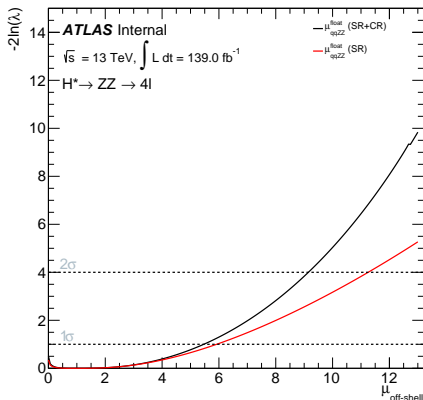
Kinematic distribution on the CR



- $130 < m_{4\ell} < 220$ GeV, $N_{\text{jets}} \geq 2$
- This region will be divided into 8 bins and then added to the SR.
- Currently, we use the MC number in the CR instead of the data.

Off-shell couplings measurements: $4l$ channel

Likelihood scan vs $\mu_{\text{off-shell}}$

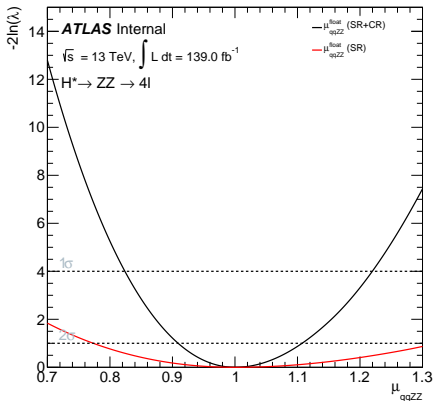


□ SR+CR: best fit $\mu_{\text{off-shell}} = 1.0^{+4.46}_{-1.1}$ at 95% CLs 8.42.

□ SR: best fit $\mu_{\text{off-shell}} = 1.0^{+4.92}_{-1.2}$ at 95% CLs 10.45.

Off-shell couplings measurements: $4l$ channel

Likelihood scan vs μ_{qqZZ}



□ SR+CR: best fit $\mu_{qqZZ} = 1.0^{+0.1}_{-1.0}$.

□ SR: best fit $\mu_{qqZZ} = 1.0^{+0.33}_{-0.22}$.

- Including the CR to the SR improve the fit by $\sim 19\%$.
- No systematic is considered in the fit, only luminosity.
- The normalisation of the $qqZZ$ background is set free.

To do ...

- Adding all the systematic and then try to check the Ranking, pull etc.
- Then see the background normalisation effect.



Thank you!

