

Weekly Report NTUA 20/3/2020

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Status Report

- Analysis:
 - Mass fit
 - Reduce the ttbar contamination
 - Simultaneous fit in 0 and 2btag region
 - Unfolding
 - Result of the fit has a small deviation regardless the method we are using
 - Signal Extraction--> Unfolding to parton or particle level and comparison with 2016 paper results

$$S(x_{reco}) = D(x_{reco}) - N_{QCD, reduced}^{(2)} C_{QCD}^{shape}(x_{reco}) Q(x_{reco}) - B(x_{reco})$$

The diagram illustrates the equation for signal extraction, $S(x_{reco}) = D(x_{reco}) - N_{QCD, reduced}^{(2)} C_{QCD}^{shape}(x_{reco}) Q(x_{reco}) - B(x_{reco})$, with callouts for each term:

- Fiducial Yield**: Points to $S(x_{reco})$
- Measured dist from data**: Points to $D(x_{reco})$
- Mass Fit**: Points to $N_{QCD, reduced}^{(2)}$
- QCD shape taken from Data (CR)**: Points to $C_{QCD}^{shape}(x_{reco})$
- QCD shape correction factor**: Points to $Q(x_{reco})$
- Subdominant bkg shape and contribution (MC)**: Points to $B(x_{reco})$



Workaround

For selecting a Control and Signal Region we apply the following:

Signal Region

- Basic Selection
- Medium b-tagging WP
- Top Tagger Cut (> selected WP)

Control Region

- Basic Selection
- **NOT** Loose b-tagging WP
- **NOT** Top Tagger Cut (< selected WP)
- !! Giannis Suggested applying a harder cut in the Control region to reduce Top Contamination
- !! I suggest that we do the same thing we do with b-tagging:
- For the CR:
 - **NOT** Top Tagger Cut lower than working point that is bkg dominated. For example we could take -0.6 up to -0.3

