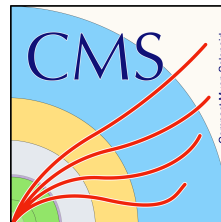


Weekly Report NTUA 27/3/2020

George Bakas



Status Report

- Analysis:
 - New Method for extracting Nqcd in signal region
 - Fit not possible because 0btag and 2btag QCD have very different shapes
- 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

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

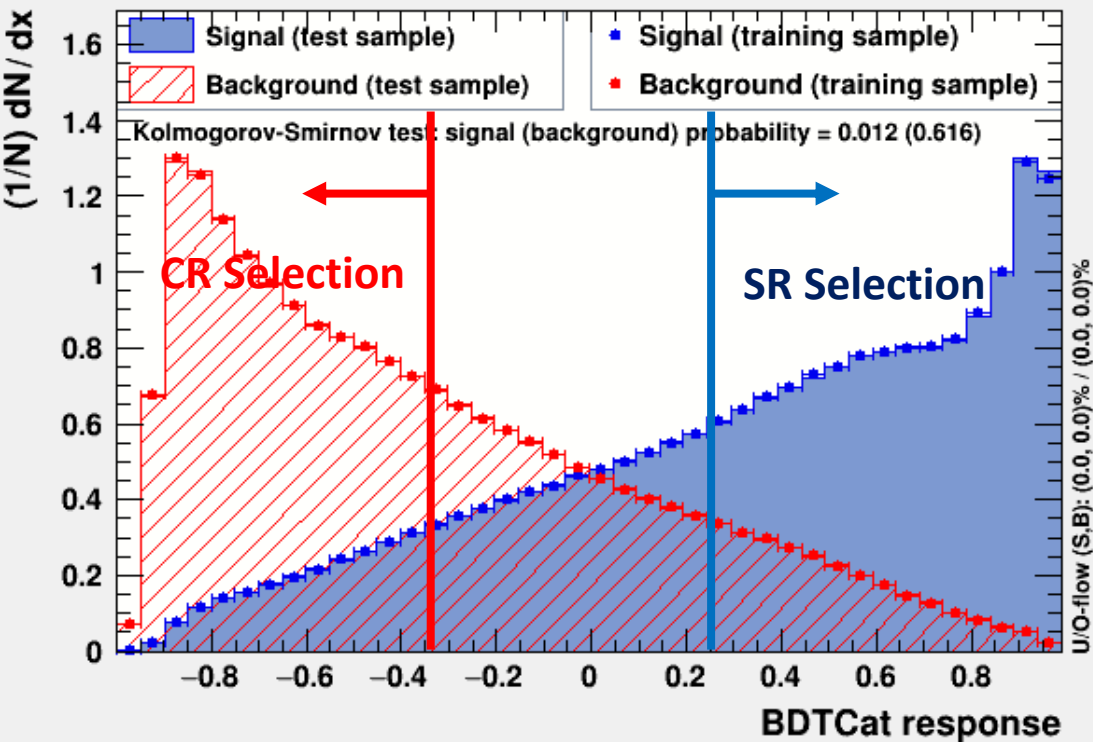
The diagram illustrates the ABCD method equation with callouts for each term:

- Fiducial Yield**: Points to $S(x_{reco})$
- ABCD Method**: Points to the equation
- Measured dist from data**: Points to $D(x_{reco})$
- QCD shape taken from MC**: Points to $Q(x_{reco})$
- QCD shape correction factor**: Points to $C_{QCD}^{shape}(x_{reco})$
- Subdominant bkg shape and contribution (MC)**: Points to $B(x_{reco})$



Workaround

TMVA overtraining check for classifier: BDTCat



$$C = \frac{A}{B} D$$

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

Signal Region

- Basic Selection
- Medium b-tagging WP
- Top Tagger Cut (> selected WP1)

Control Region

- Basic Selection
- **NOT** Loose b-tagging WP
- **NOT** Top Tagger Cut (< selected WP2)

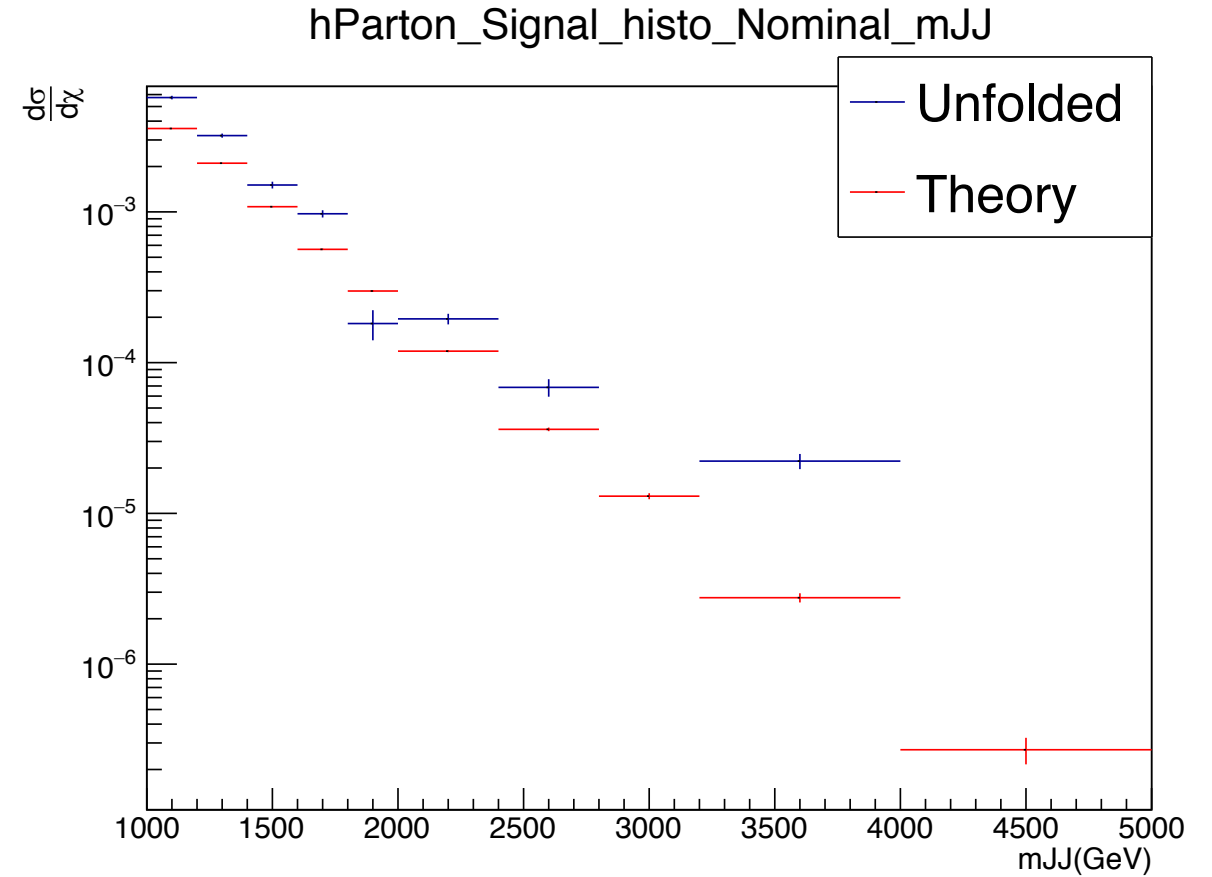
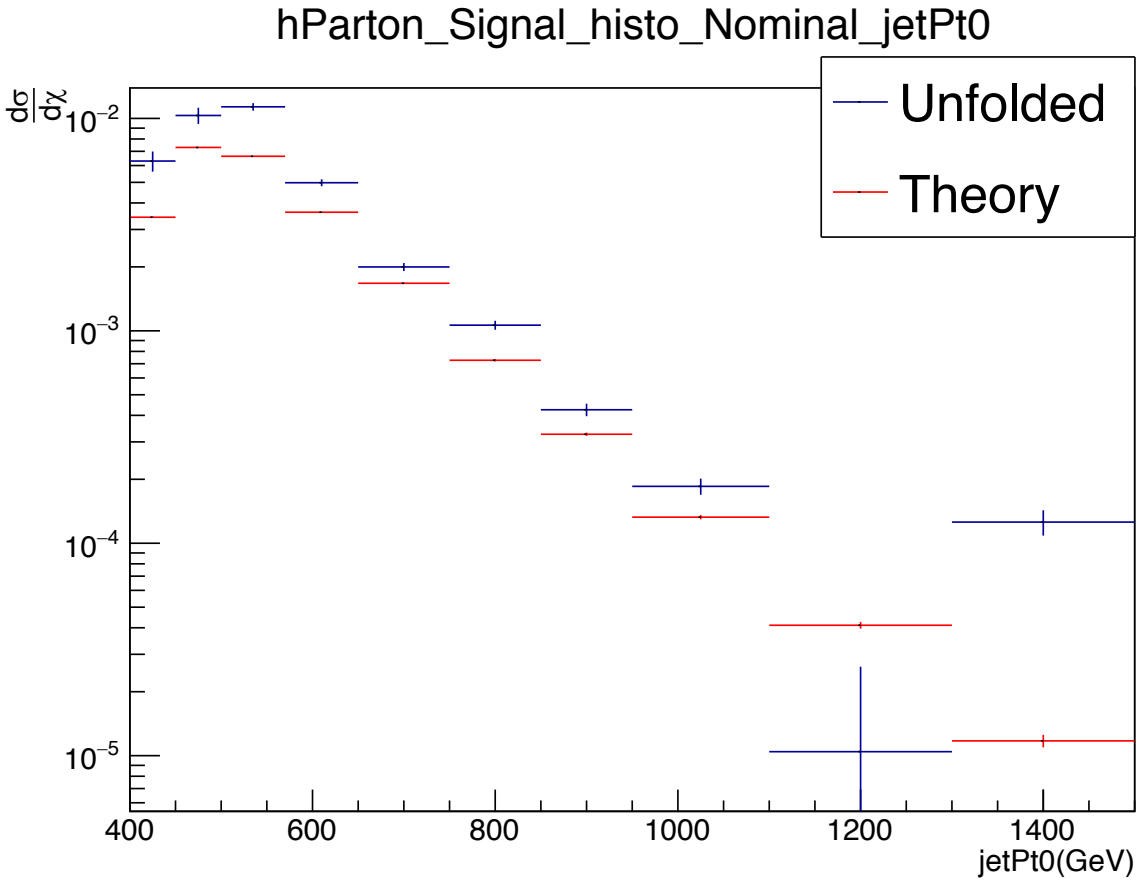
Top tagged

Both jets TopTagged + Both jets !B-tagged A	Both jets TopTagged + Both jets B-tagged (Signal Region) C
Both jets !TopTagged + Both jets !B-tagged B	Both jets !TopTagged + Both jets B-tagged D

B tagged



Unfolding Parton



Unfolding Particle

