

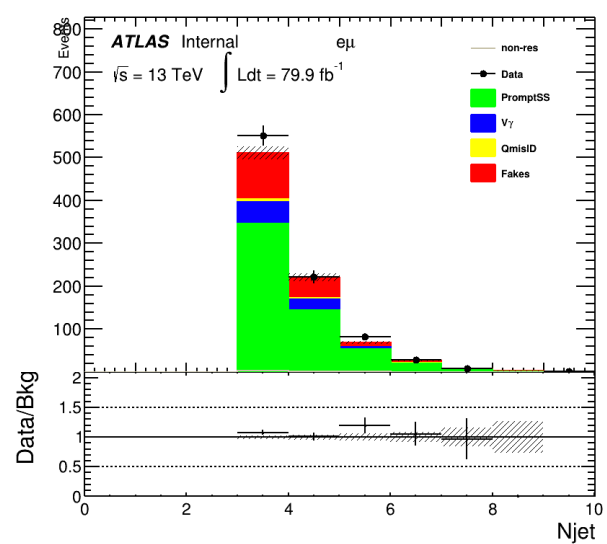
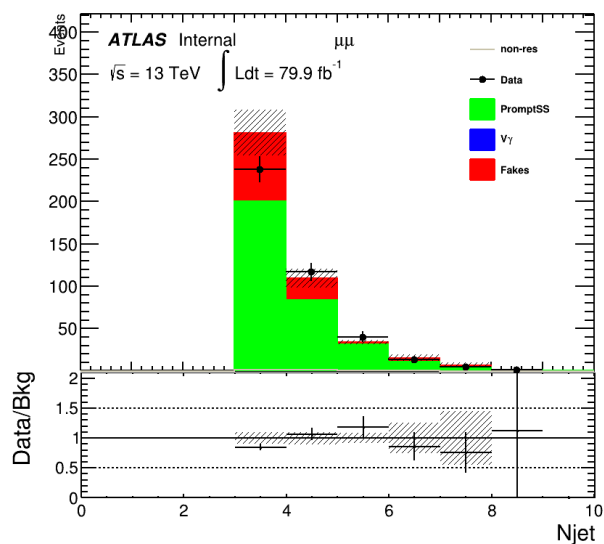
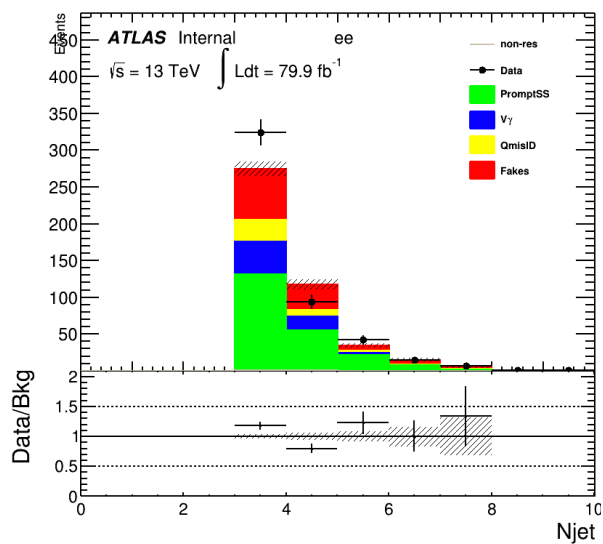
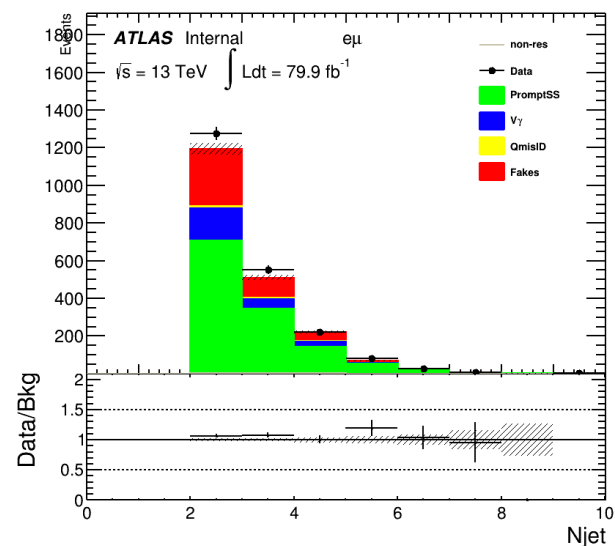
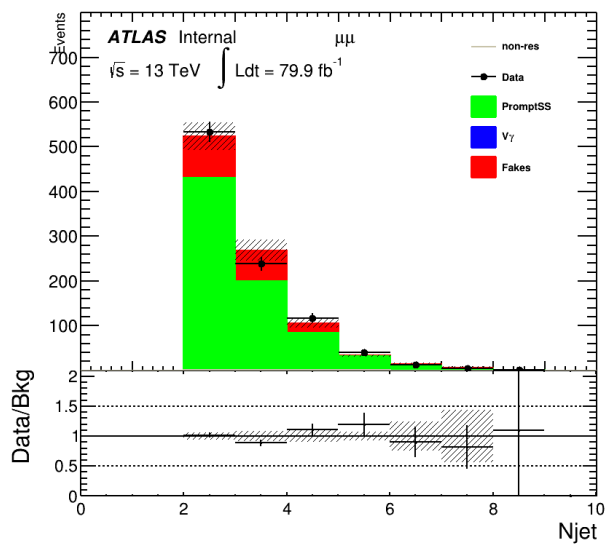
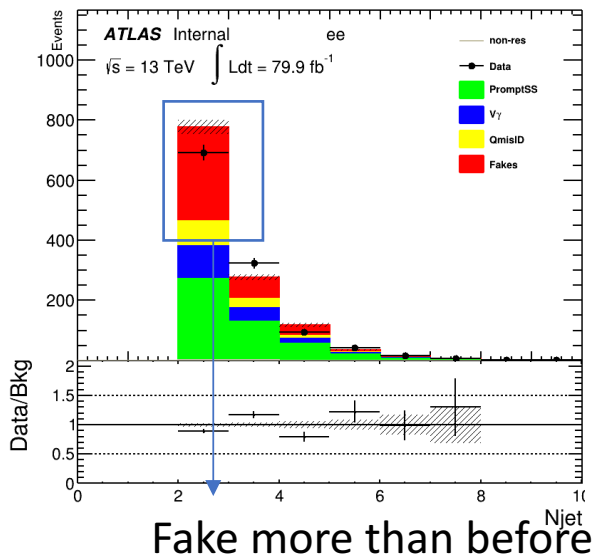
# Weekly Report

Xin Shuiting

# What's New

- Samples with jets momentum available now.
- Looks on  $t\bar{t}$  & Zjets Validation Region
- MVA study.

# Njets $\geq 2$



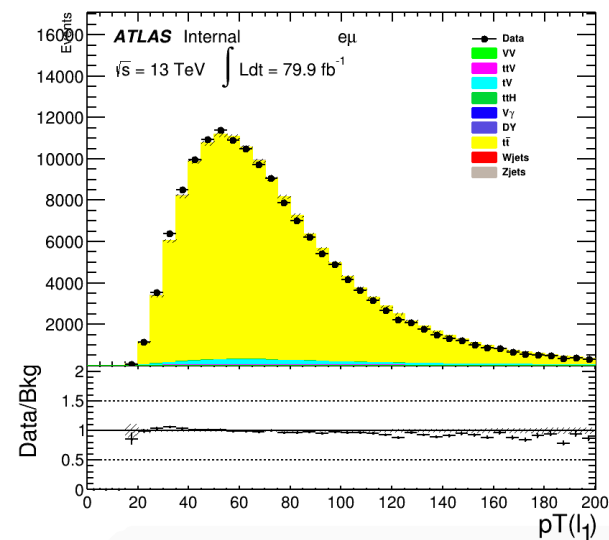
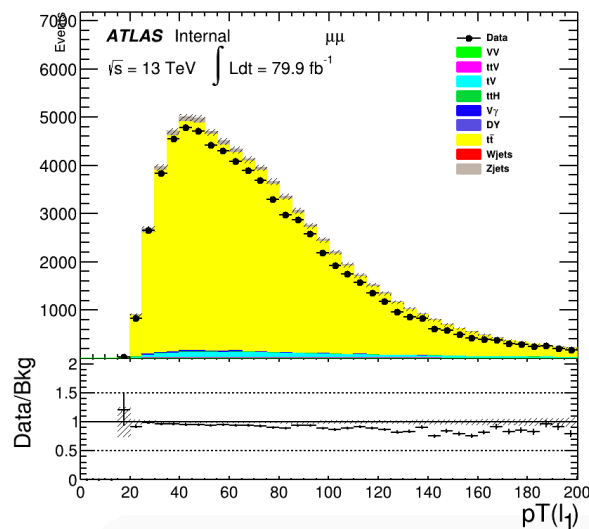
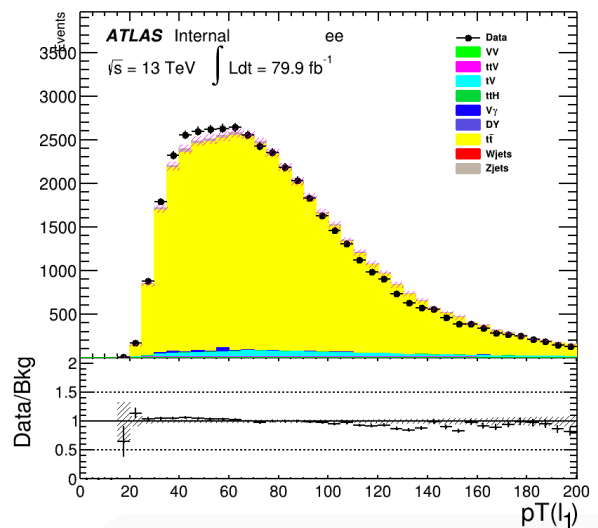
Reweight events by multiplying  $\text{lepSFObjTight} * \text{lepSFTrigTight} (\text{avg} \sim 0.91)$

#Prompt,  $V_\gamma$  decrease and Fake factor become larger

$t\bar{t}$	Two tight leptons with opposite sign leptons ( $M(\ell\ell) - M(Z)) > 20 \text{ GeV}$ At least two b-jets
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Ref:ATL-COM-PHYS-2016-1121, ATL-COM-PHYS-2016-485

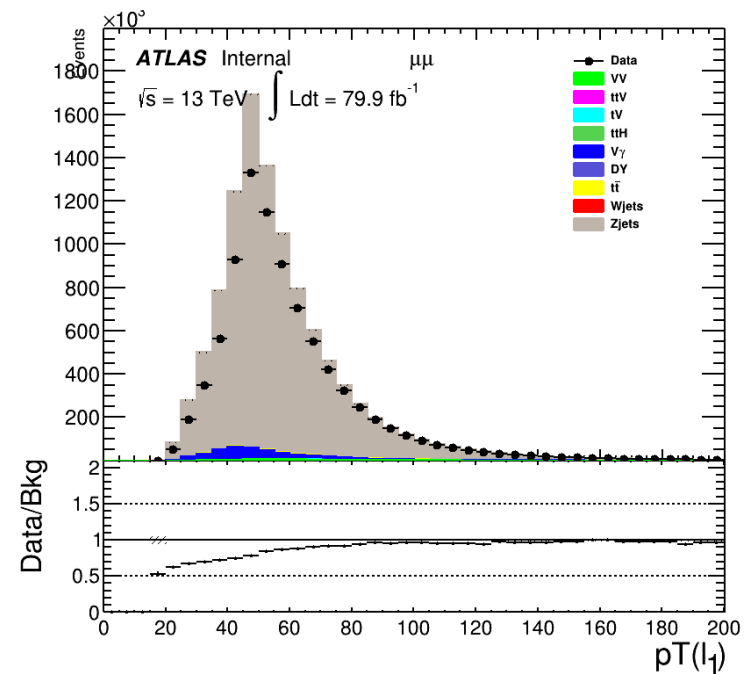
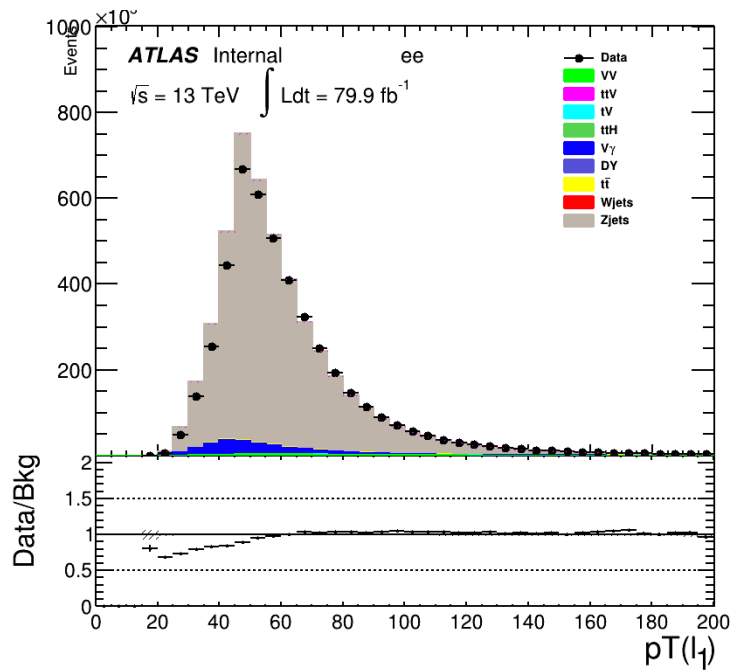
Distriburion with  $\text{lepSF}^*$



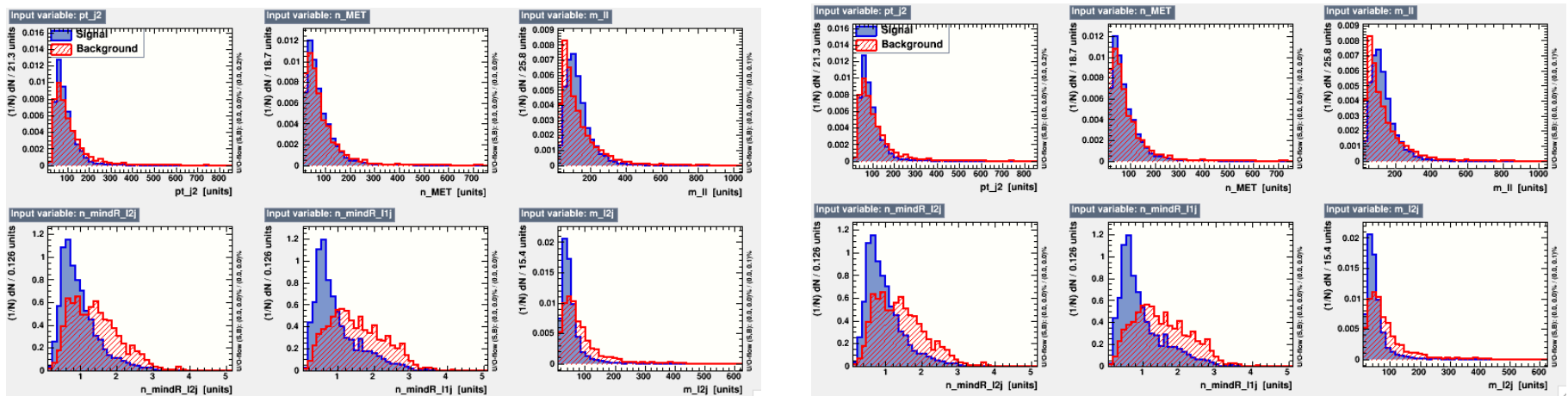
## Bad modeled MC in Zjets CR

Zjets	Two tight leptons with opposite sign and same flavor ( $M(\ell\ell) - M(Z)) < 45$ GeV b veto, at least one jet
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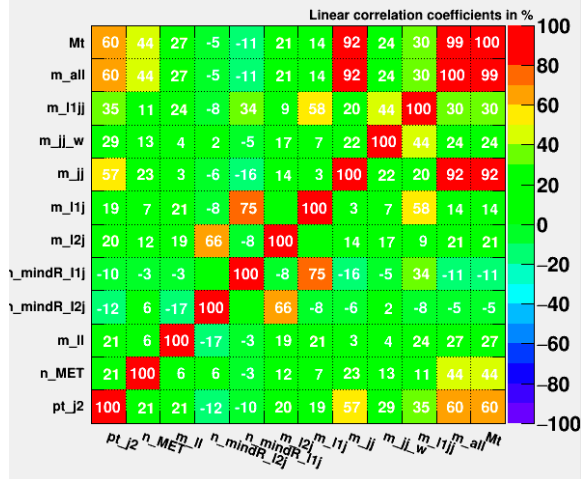
Zjets DSID:364100~354139(ee,uu,tautau final state)



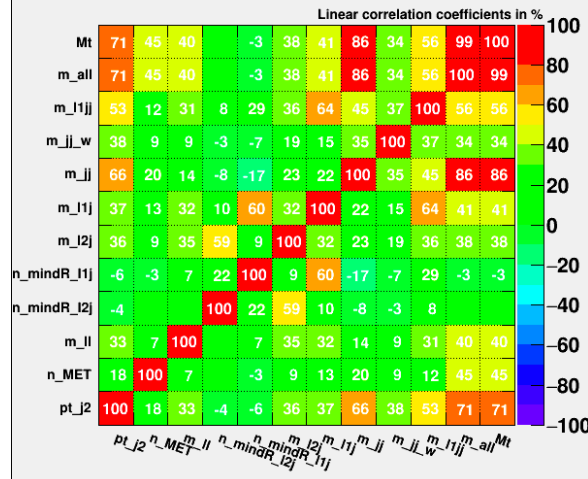
Input variable selection: all bkg and nonres samples are used for training.



### Correlation Matrix (signal)



## Correlation Matrix (background)



Variable	Separation
mindR_l1j	1.734e-01
mindR_l2j	1.681e-01
m_l1jj	1.354e-01
m_ll	4.579e-02
m_all	2.757e-02

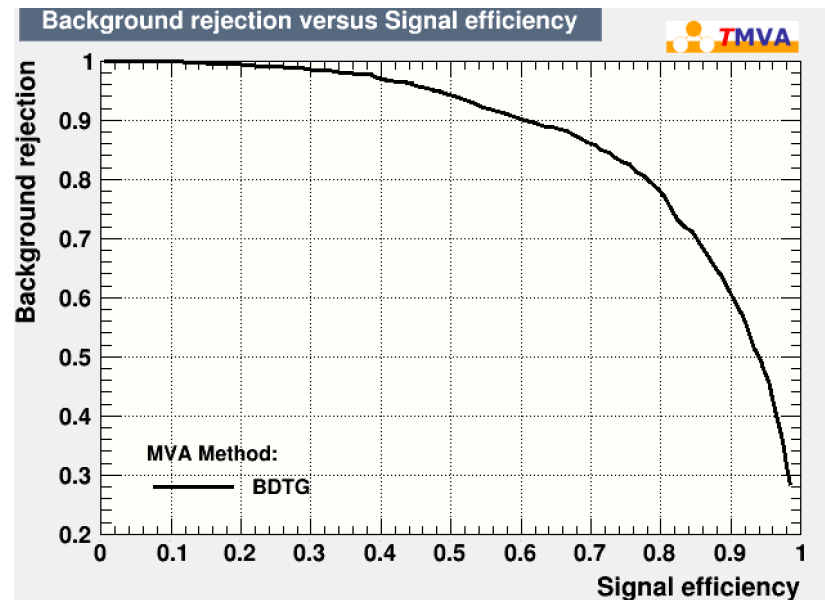
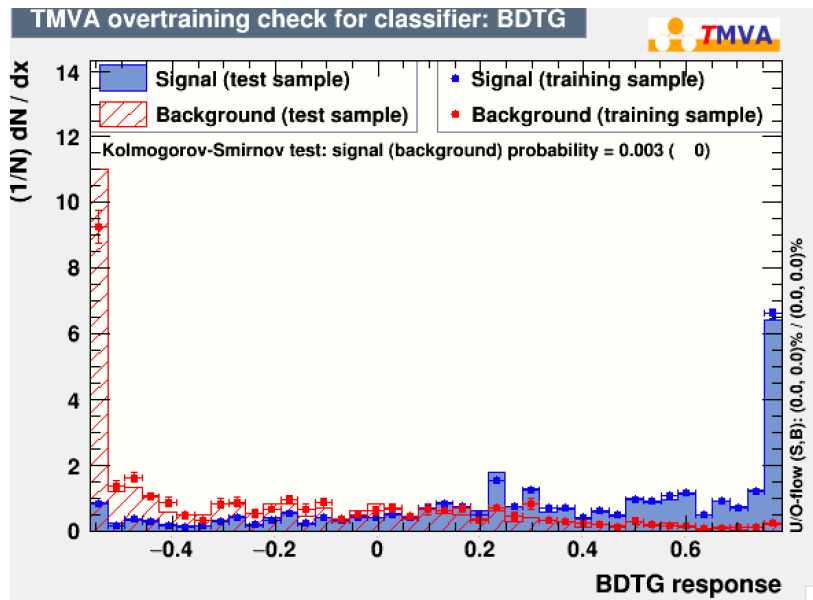
Drop high correlated variables. Finally Top five variables are used

Tmva will drop events with negative weight. Negative weight comes from

- MC generator (mcWeightOrg)
- Fake background: 
$$N_{ee}^{\text{fakes}}(N_{\text{jet}} \geq 3) = (N_{e\ell}^{\text{data}} - N_{e\ell}^{\text{promptSS}} - N_{e\ell}^{V\gamma} - N_{e\ell}^{\text{QmisID MC}})(N_{\text{jet}} \geq 3) \times \theta_e$$

Minus weights

Solution: Convert it to PDF (not complete yet)



However, this results ignore all negative weights.

## Summary & to dos

- Results updates based on how good modeled the samples are (don't wanna spend time on this )
- Mva with negative weights.
- Think about closure test of Fake factor Methods: Different yields in low Njets and higt Njets region. will be treated as Sys.