

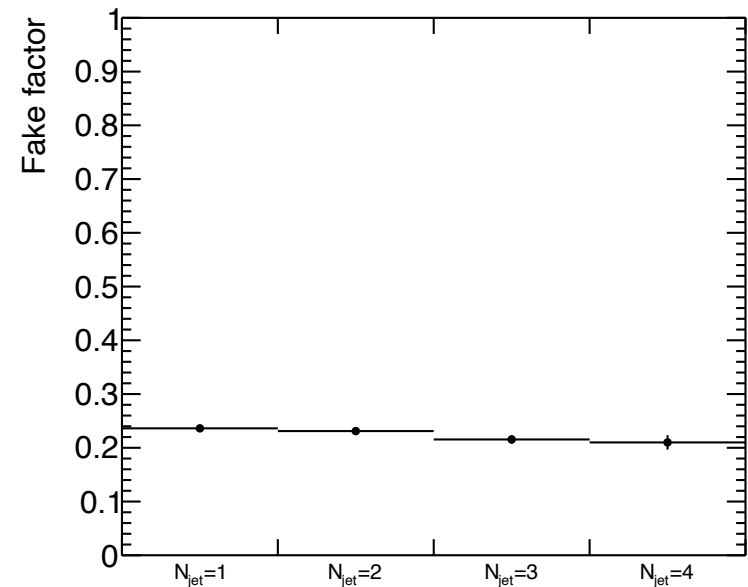
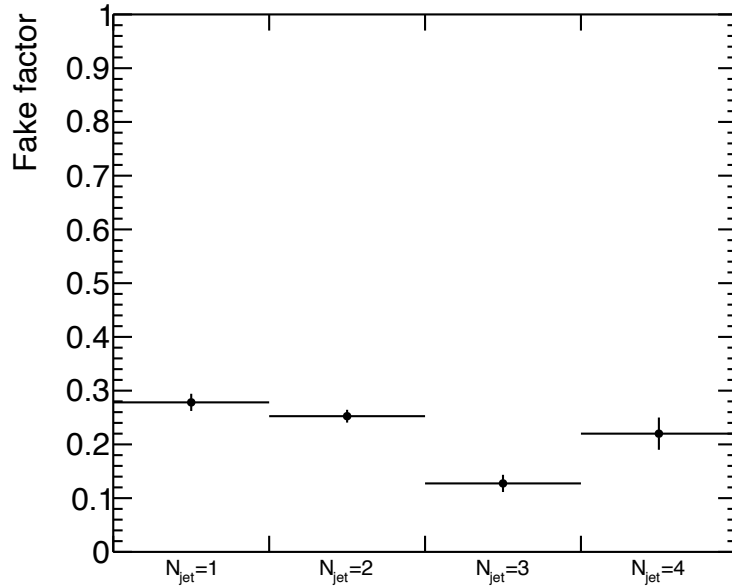
Weekly Report

Shuiting Xin

Feb 1.2021

HHML 2LSS analysis

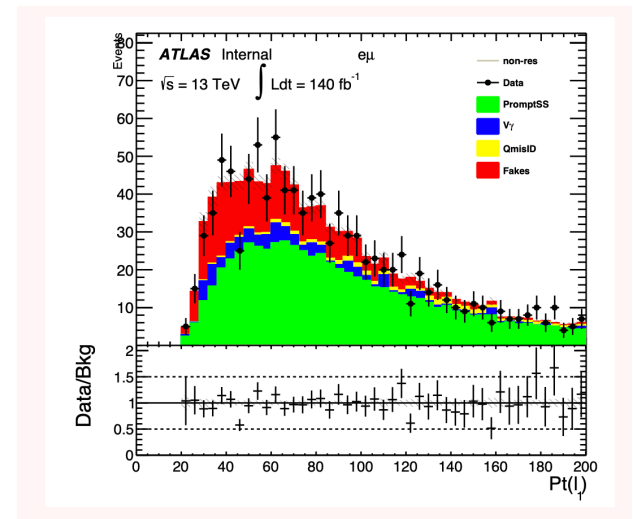
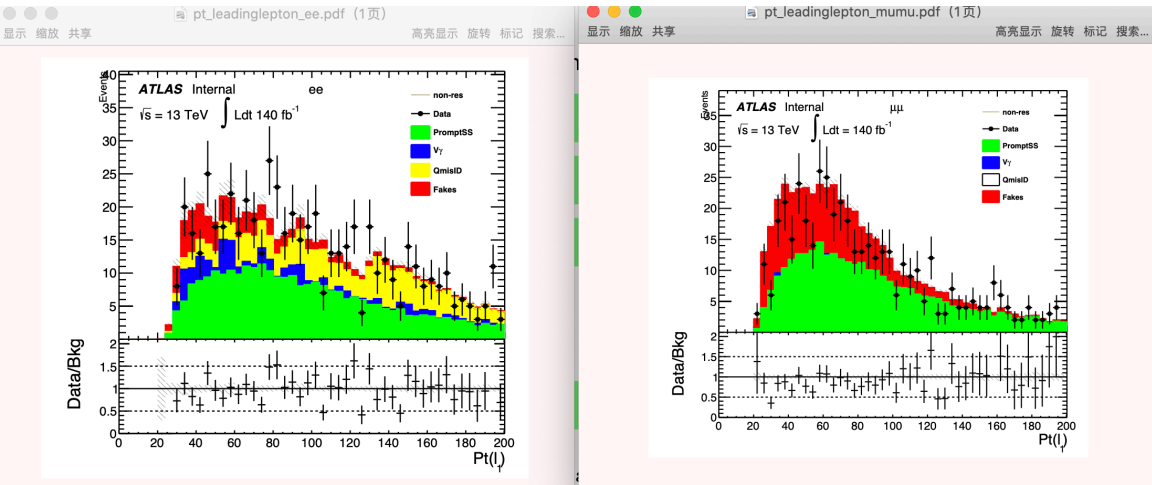
❖ Njets dependence check



- ◇ Tight : FCLoose & PLVTight. FCLoose
- ◇ An-tight : !FCLoose or !PLVTight. !FCLoose
- ◇ Drawback of without PLV : huge ttbar events

Improve ff stability

- ❖ category in pt bins.
- ❖ apply truth match and trigger match to leading pt lepton. From kinematics pt of fake lepton is smaller usually.



Cross-validation BDT

❖ Construct discriminate variables

- ◇ max_eta
- ◇ MLepMet
- ◇ mjjMax_frwdJet

❖ Cross-validation

- ◇ Able to use all data.
- ◇ Folded with 3 category.
- ◇ A python function was used to search the best parameter space: hyperopt.fmin
- ◇ Can find best Ntrees, MaxDepth, Ncuts, Shrink...

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: Rank : Variable           : Separation  
-----  
: 1 : n_mindR_l1j           : 1.739e-01  
: 2 : m_l2j                 : 1.529e-01  
: 3 : n_mindR_L2j          : 1.462e-01  
: 4 : DRl101               : 1.130e-01  
: 5 : max_eta               : 7.299e-02  
: 6 : m_all                 : 5.836e-02  
: 7 : Mt                    : 5.796e-02  
: 8 : m_ll                  : 5.614e-02  
: 9 : eta_leadinglepton    : 4.765e-02  
: 10 : MLepMet              : 3.634e-02  
: 11 : eta_sublepton       : 3.499e-02  
: 12 : channel              : 3.045e-02  
: 13 : mjjMax_frwdJet      : 2.464e-02  
: 14 : n_MET                : 1.033e-02  
: 15 : eta_frwdjet         : 9.489e-03  
: 16 : dEta_maxMjj_frwdjet : 7.251e-03  
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```

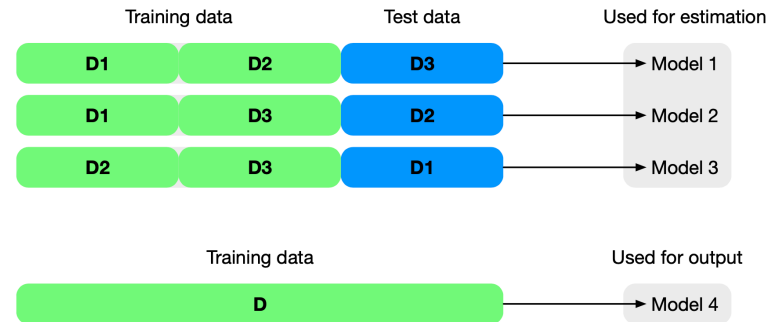
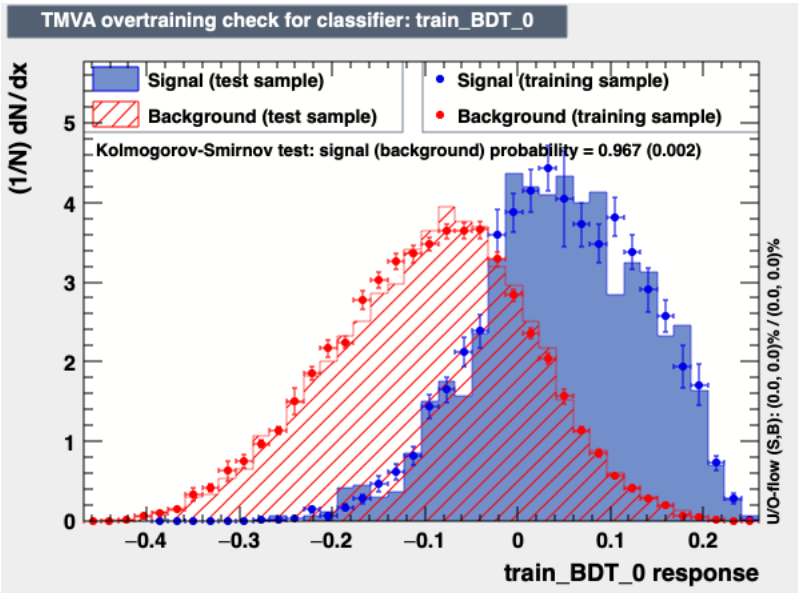
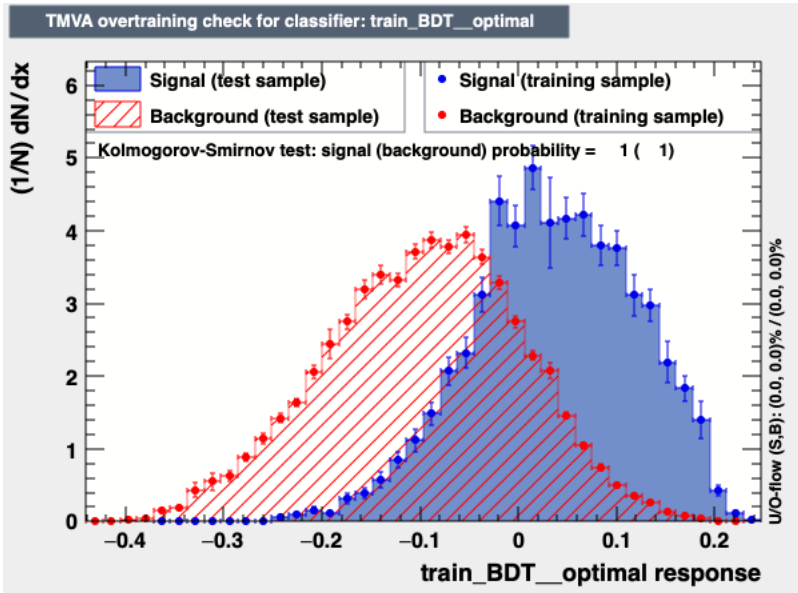


Figure 11: Model 1, 2, and 3 are used only for performance estimation and are then thrown away. A final model (model 4) is trained using the complete dataset.

Cross-validation BDT

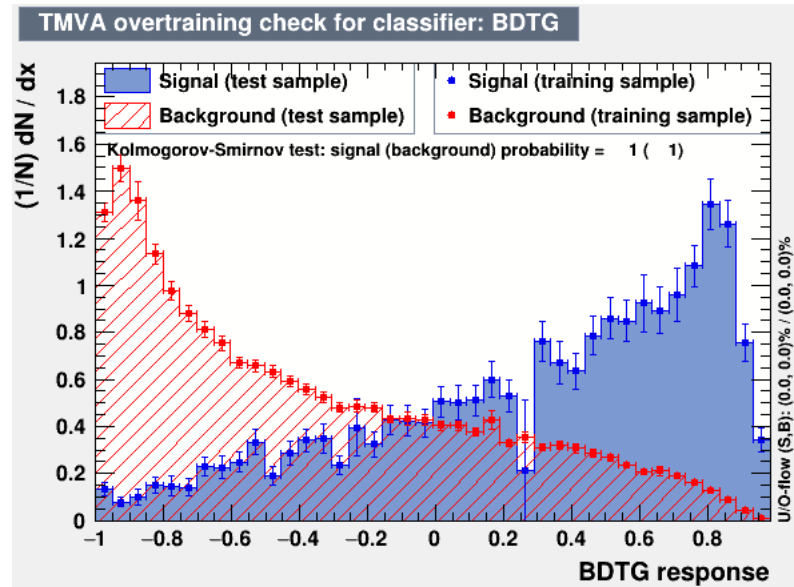


◇ Without CV



with. CV

BDTG performance



◇ Next: Finish application and statistics study.

QT

- ❖ A proposal talk on HGTD module meeting last week.
 - ◇ <https://indico.cern.ch/event/982494/>
 - ◇ People are pleased to see this task started.
 - ◇ Important project but not any single person can hand them.