Weekly Report

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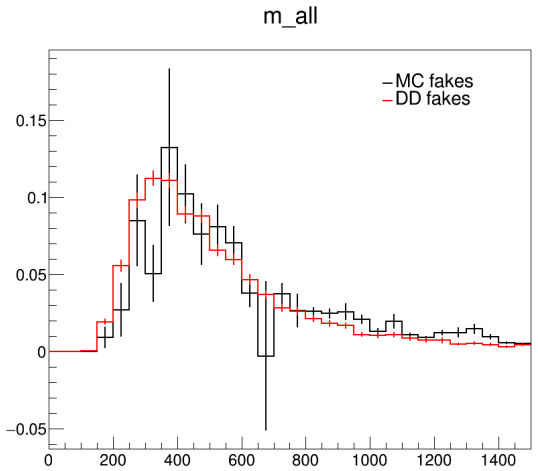
July.21.2020

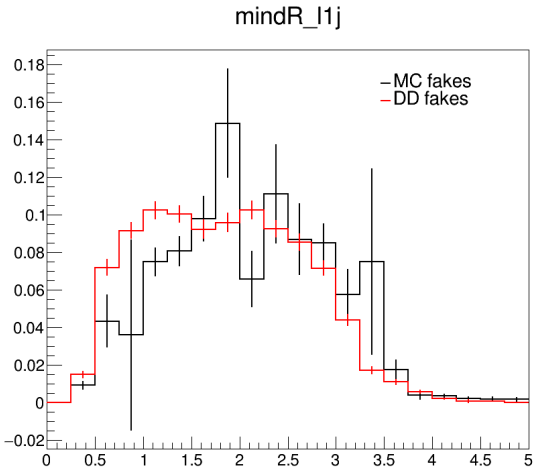
2LSS Analysis

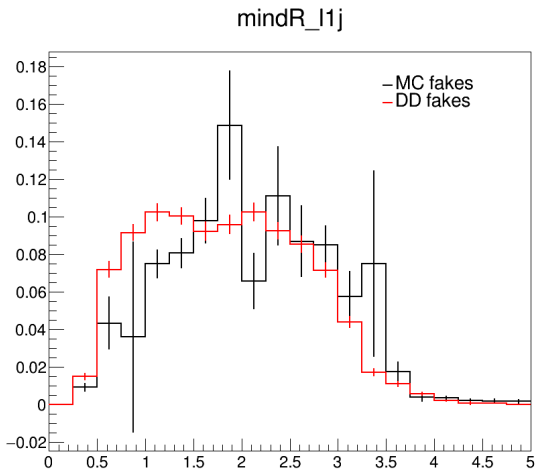
- DD Fake and MC Fake comparison

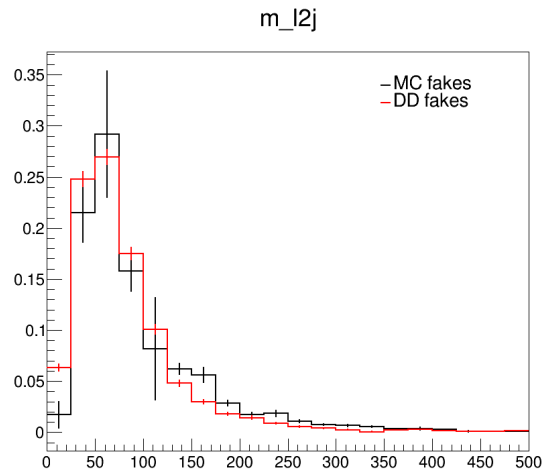
MC : ttbar + Vjets
DD : Fake Factor's

Strange peak of MC is due to some extreme weight

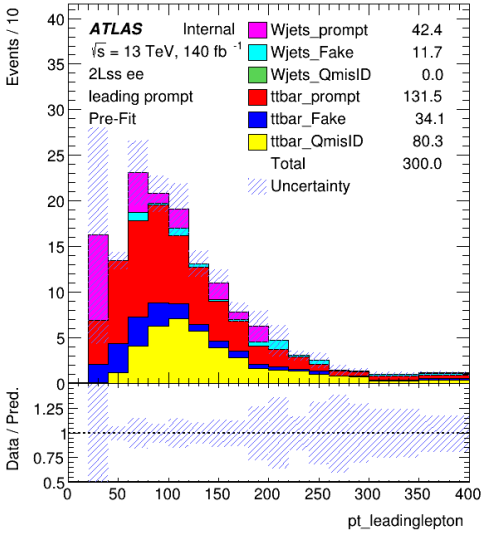


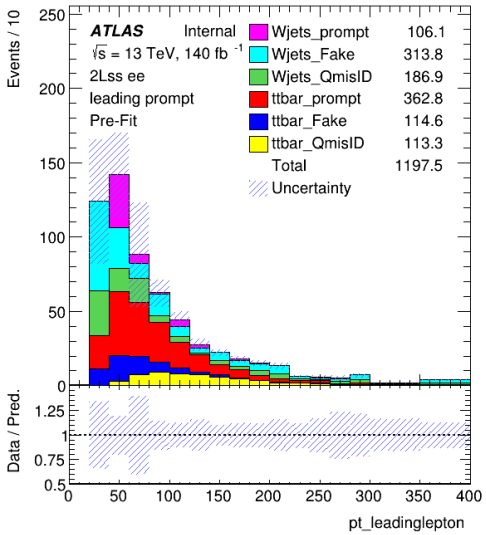


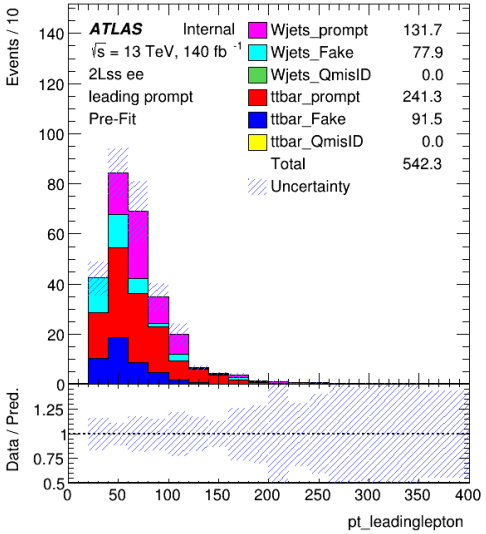


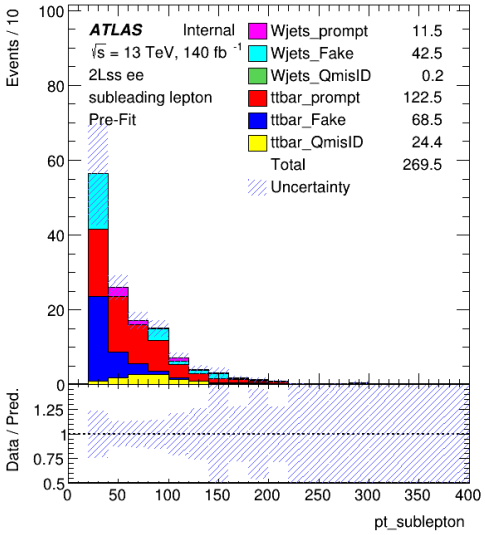


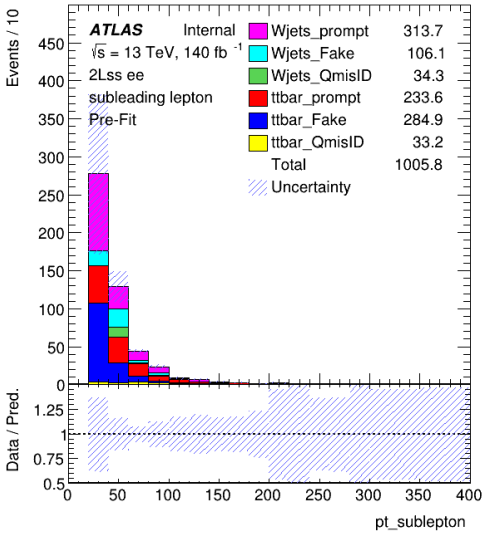
Leptons from Ttbar Wjets (1||2j CR)

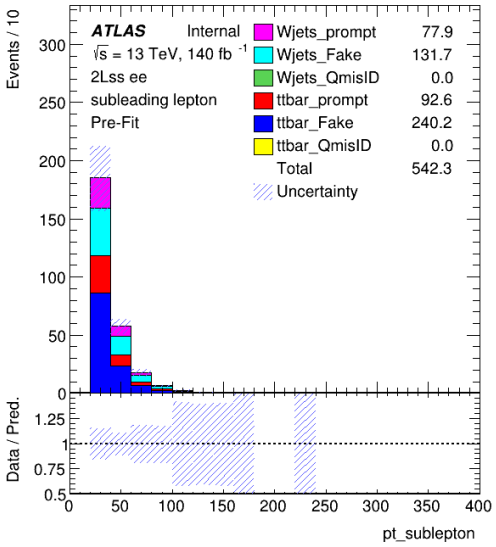










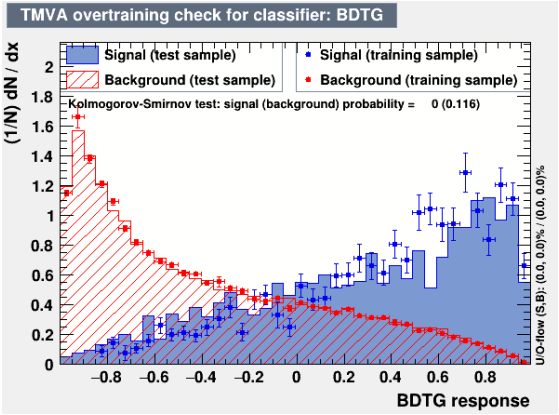


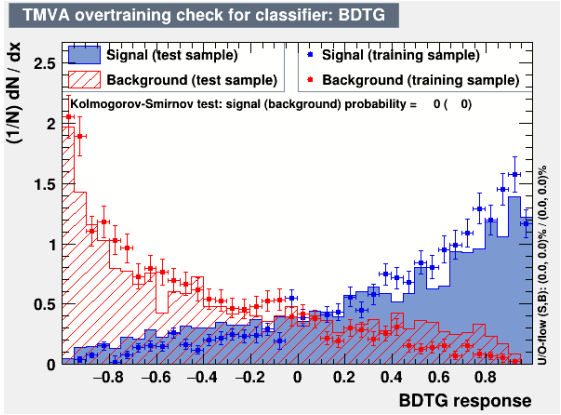
BDT training

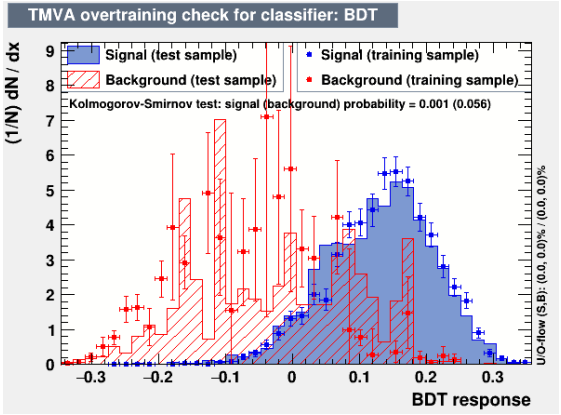
- Finally the model is trained by using DD fakes.
  - negative weights are treated by <NegWeightTreatment> options
    - I choose Boost With inverse boostweight
- Some improvements
  - Regard lepton flavour as input variables
  - Two powerful discriminators didn’t notice before : lepton eta
- New features of TMVA
  - https://root.cern.ch/doc/master/dir_57937f7cf6e069c092300443fa5e4440.html
  - An efficient way RDataFrame & TMVA in pyroot

Separate training

- Signal vs VV, signal vs ttbar, signal vs V+jets
- Separating into 2 categories, one for training, one for applying
  - ☐ Even or odd
  - ✓ Random number



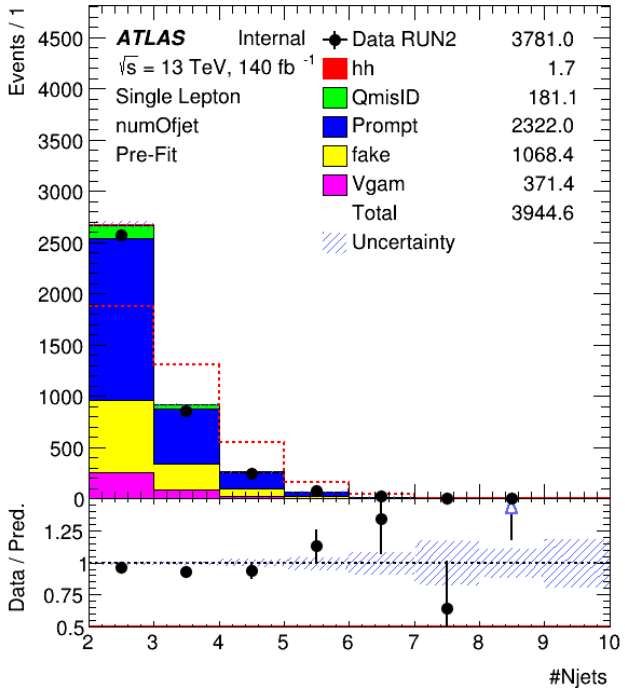


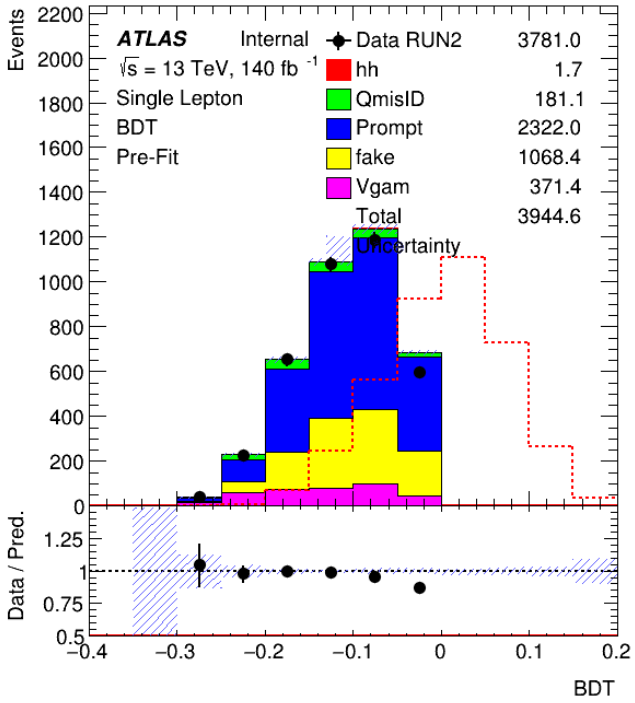


- Limited statistics of V+jets

2LSS Limits

- Only applied single BDT training model
- SR : BDT response

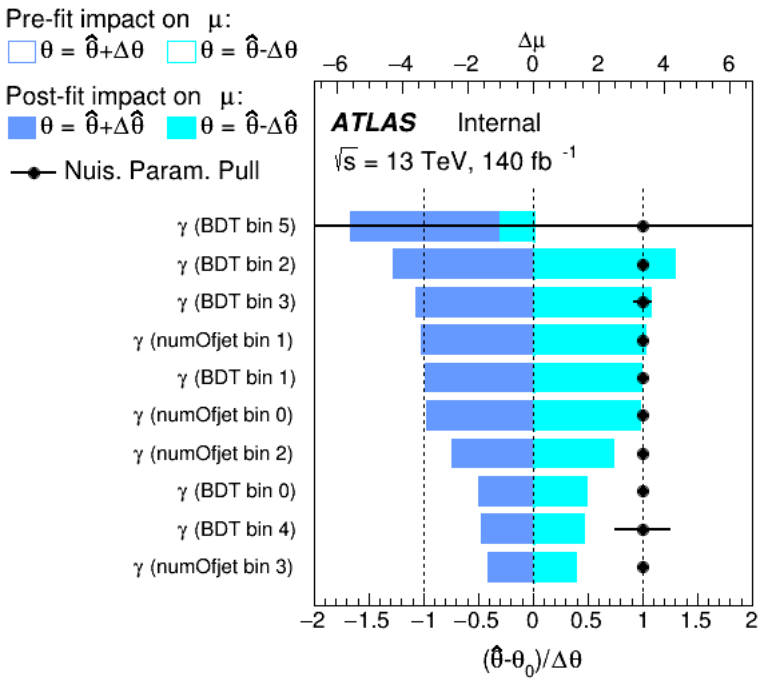




Limits by CLs method at 95%

-2sigma	-1sigma	Median	1 sigma	2sigma
22.4057	30.0797	41.7452	58.5601	79.4719

2LSS Limits



Studying on how to inject systematic uncertainty

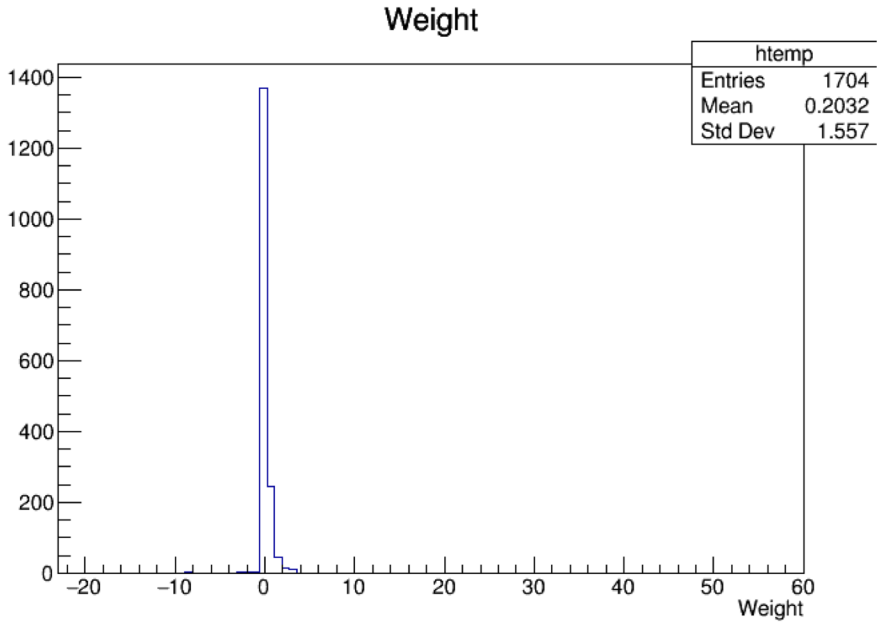
Matrix Method implementation problem

- Find some conversion mistakes but not the reason
  - Energy unit GeV/MeV
  - Selection criteria in the code
- Should self-consistent in CR 1b,1||2 j

Backup

- Wjets Weight

```
root [5] dilep->Scan("Weight","Weight>5")
************************
*    Row    *    Weight *
************************
*      558 * 11.344689 *
*      571 * 10.265819 *
*      889 * 13.076742 *
*     1141 * 53.102943 *
*     1142 * 8.2002773 *
************************
```



- Lepton eta