

Weekly Report

Xin Shuiting

4/11/2019

2LSS

Events yields after applying MVA

Divide all samples to two parts(A,B)

8 variables are used in training . MET spearation power

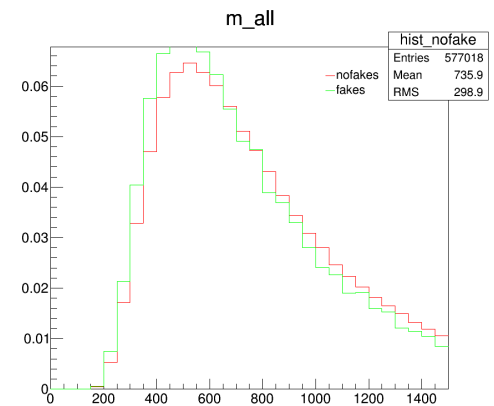
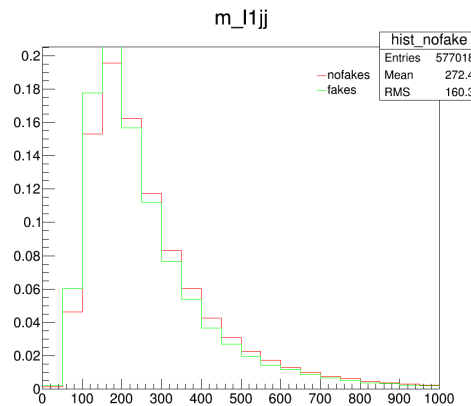
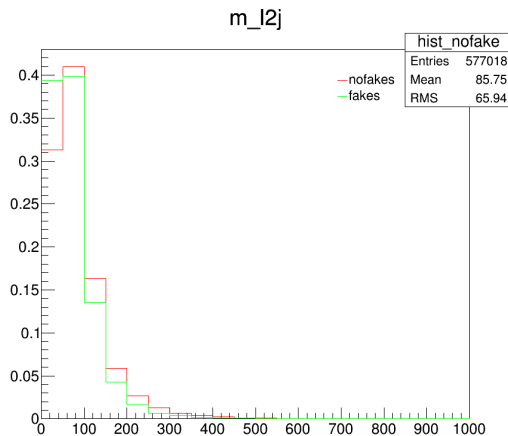
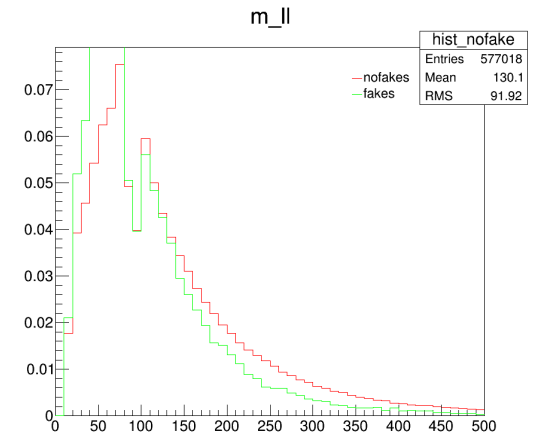
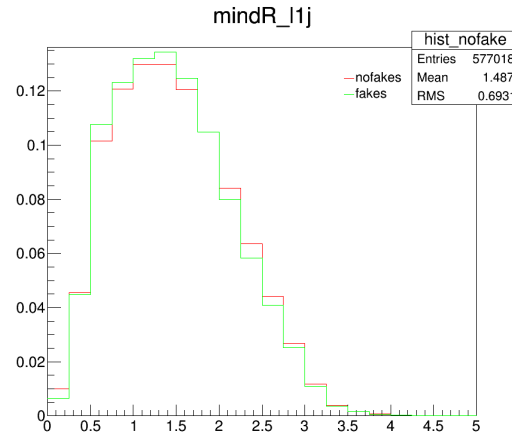
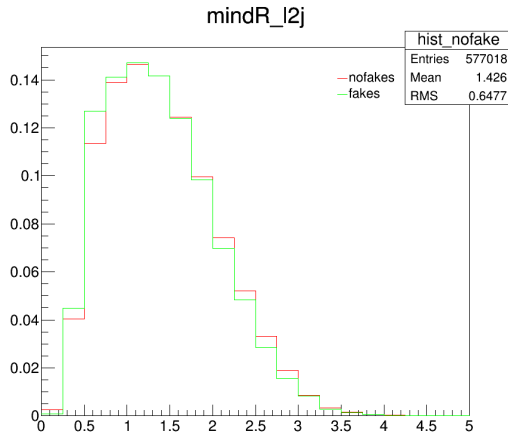
SampleA	Prompt	QmisID	Vgam	fake	signal
ee	5.35854	1.00565	2.71149	1.87695	0.034259
mumu	13.6205	0	0	5.84993	0.0820427
emu	18.8903	0.375076	2.36779	6.72485	0.10242

sampleB	Prompt	QmisID	Vgam	fake	signal
ee	1.92613	0.430283	1.23126	4.55027	0.0206405
mumu	6.97102	0	0	11.2345	0.0470559
emu	8.00222	0.171776	1.12157	0.871517	0.0738339

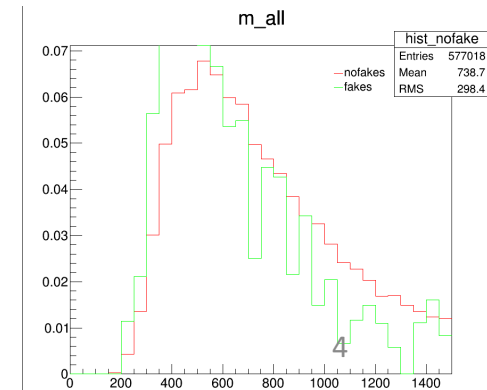
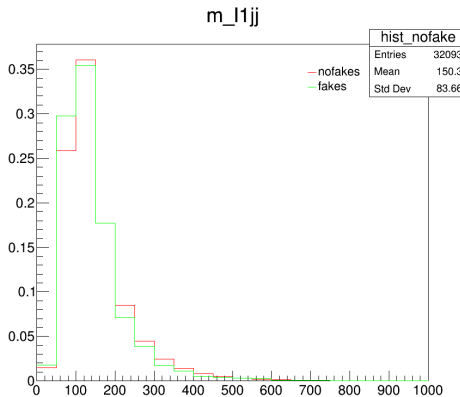
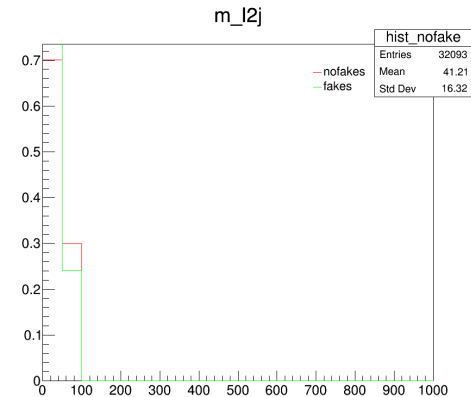
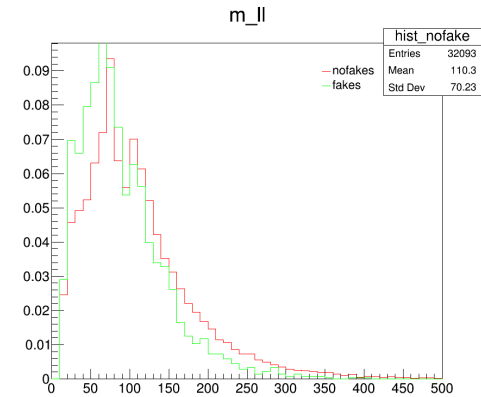
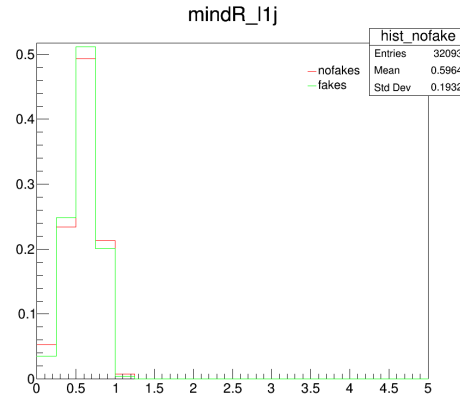
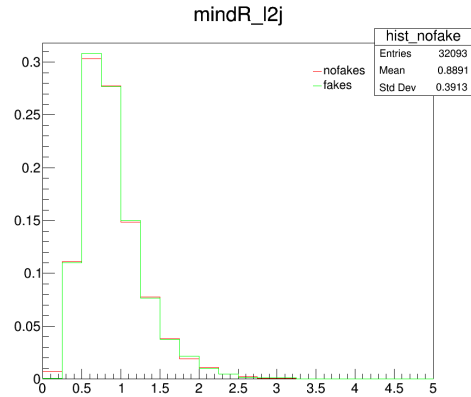
The behavior is quiet different for fakes

Problem occurs during training->Need find best parameter ?

- Comparing nonfake and fake part
- Distribution Before training(didn't weight)



- Distribution After training



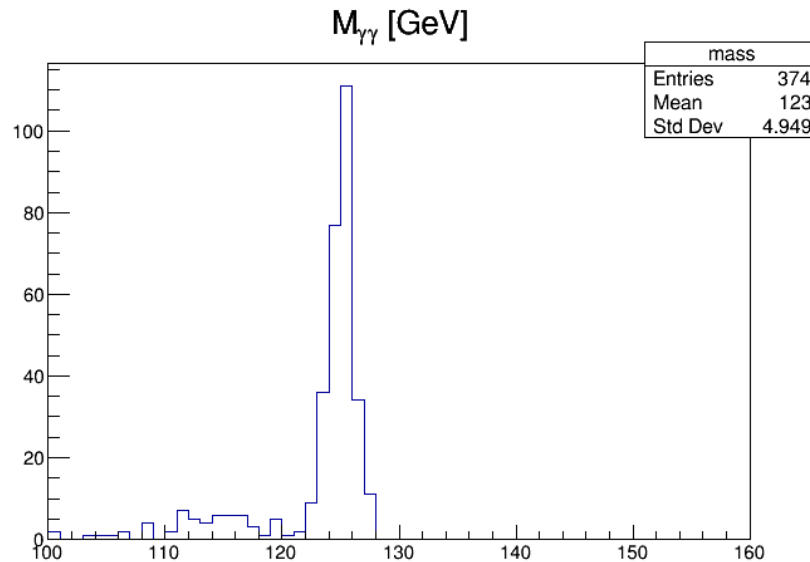
- Huge discrepancy with weighted events
- probably not a fine solution ?

Results

- At preselection level: $101.24 \sigma_{SM}$ scale to 31.05fb
- MVA based: $75.33 \sigma_{SM}$ (Need verify the method)
- Forget throw redundant efficiencis away...

$gg \rightarrow H \rightarrow Sh, h \rightarrow \gamma\gamma$

- Smearing with ATLAS detector



- Require 2 photons with $p_t > 25 \text{ GeV}$ and $|\eta| < 2.37$