

TMVA update

1- with `true_match==0`

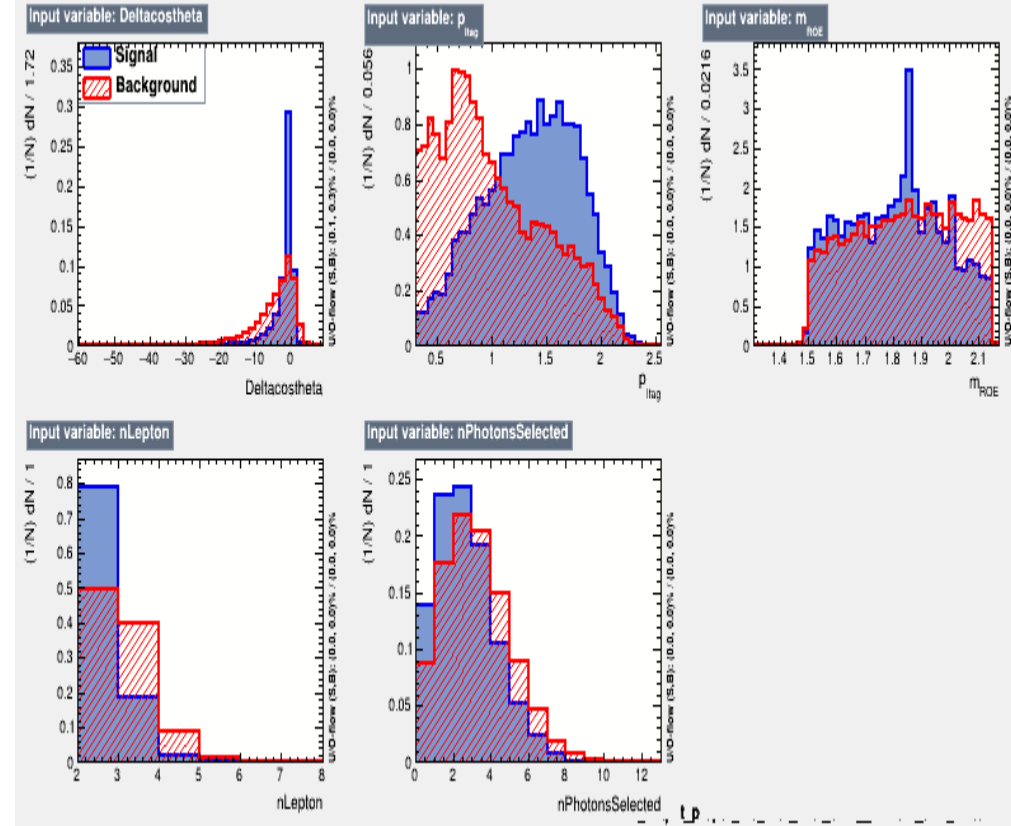
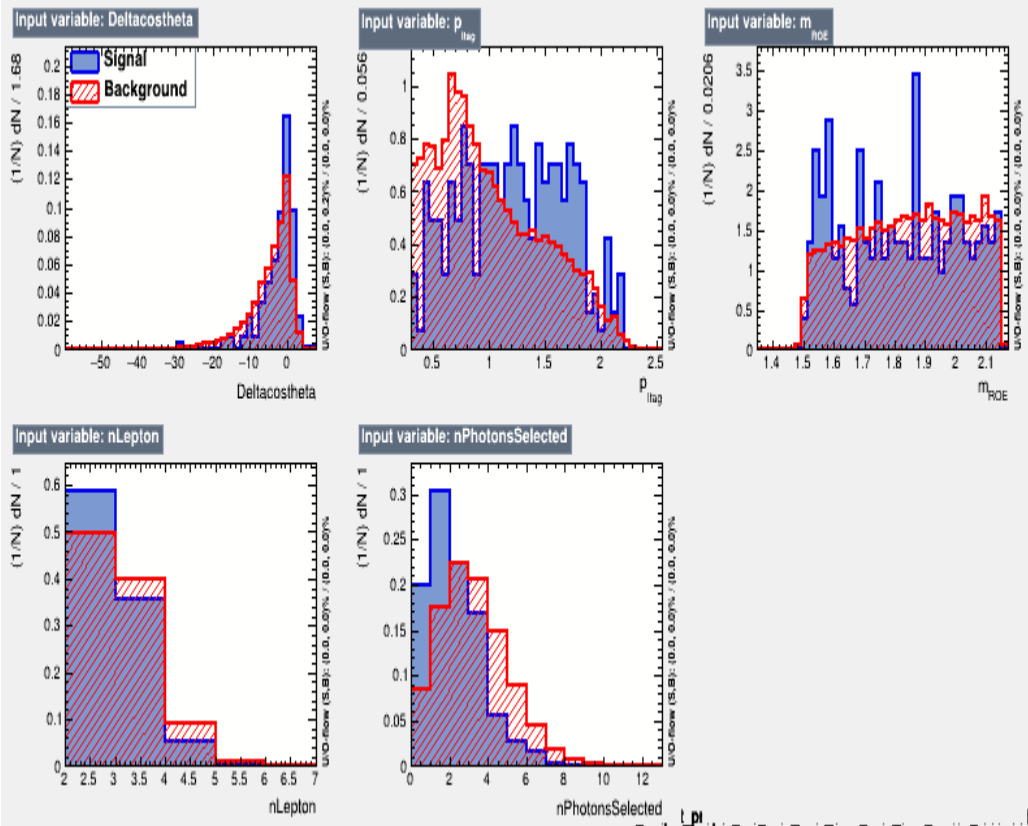
2- with different `max.depth`

18/09/2024

Input variables

With true match == 0
(~5% of the signal sample)

Without true matching



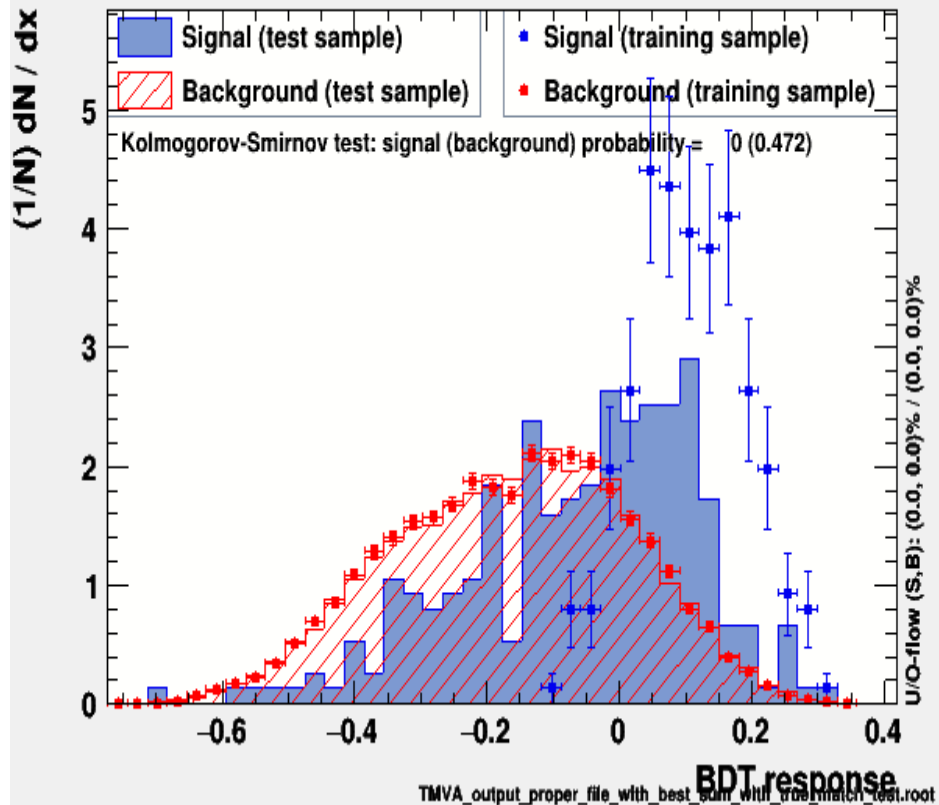
Variables importance

BDT

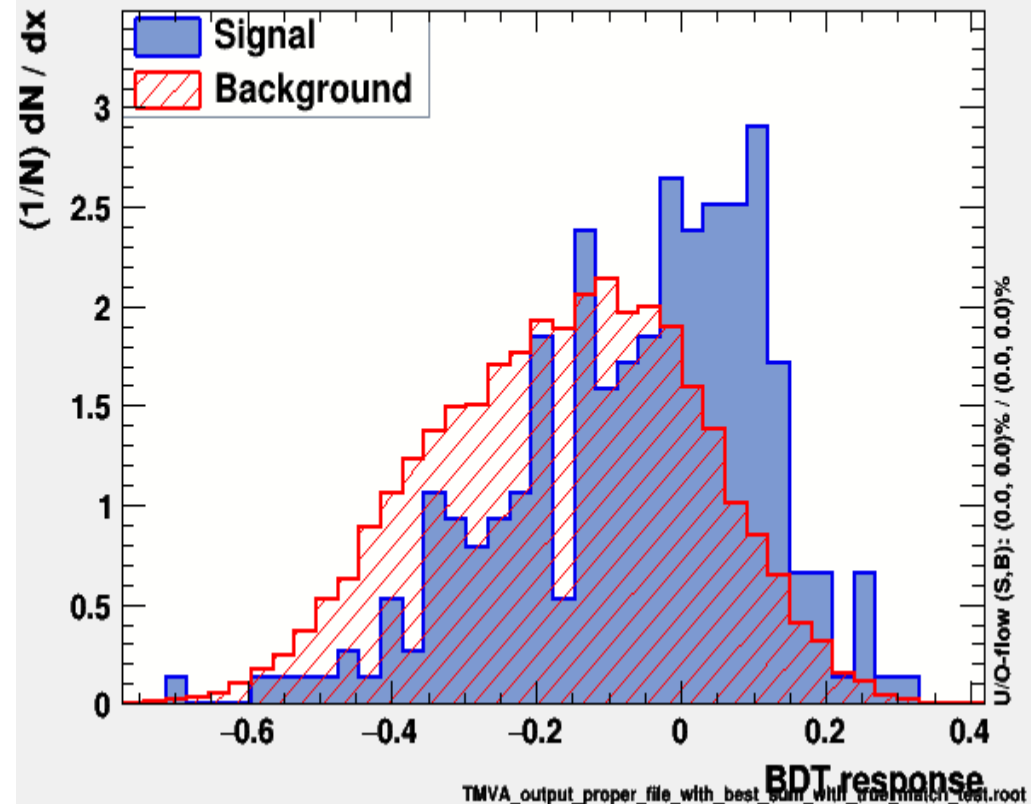
```
: Ranking result (top variable is best ranked)
: -----
: Rank : Variable           : Variable Importance
: -----
:   1 : p_{ltag}             : 2.776e-01
:   2 : Deltacostheta      : 2.772e-01
:   3 : m_{ROE}            : 1.731e-01
:   4 : nLepton           : 1.548e-01
:   5 : nPhotonsSelected  : 1.172e-01
: -----
```

BDT response

TMVA overtraining check for classifier: BDT

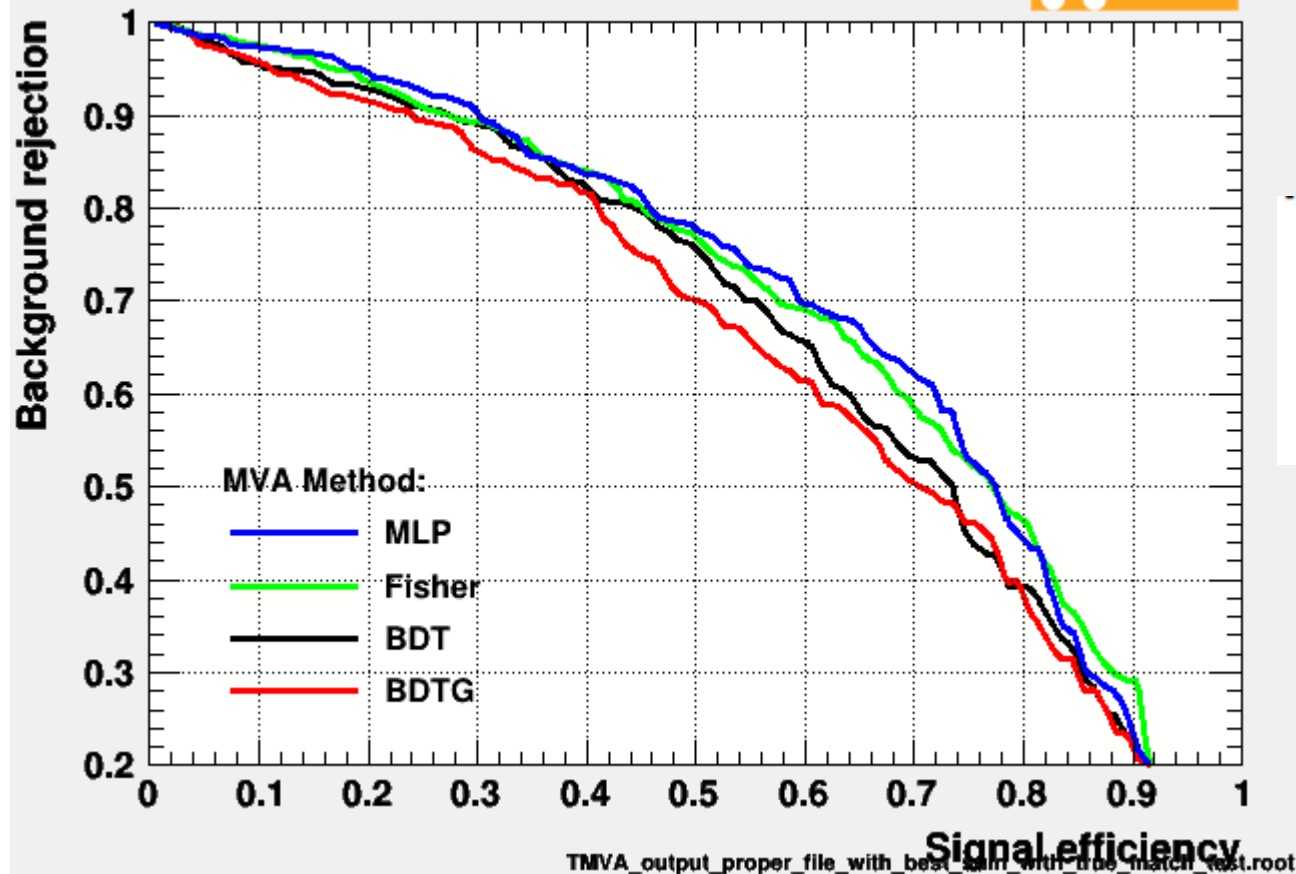


TMVA response for classifier: BDT



ROC

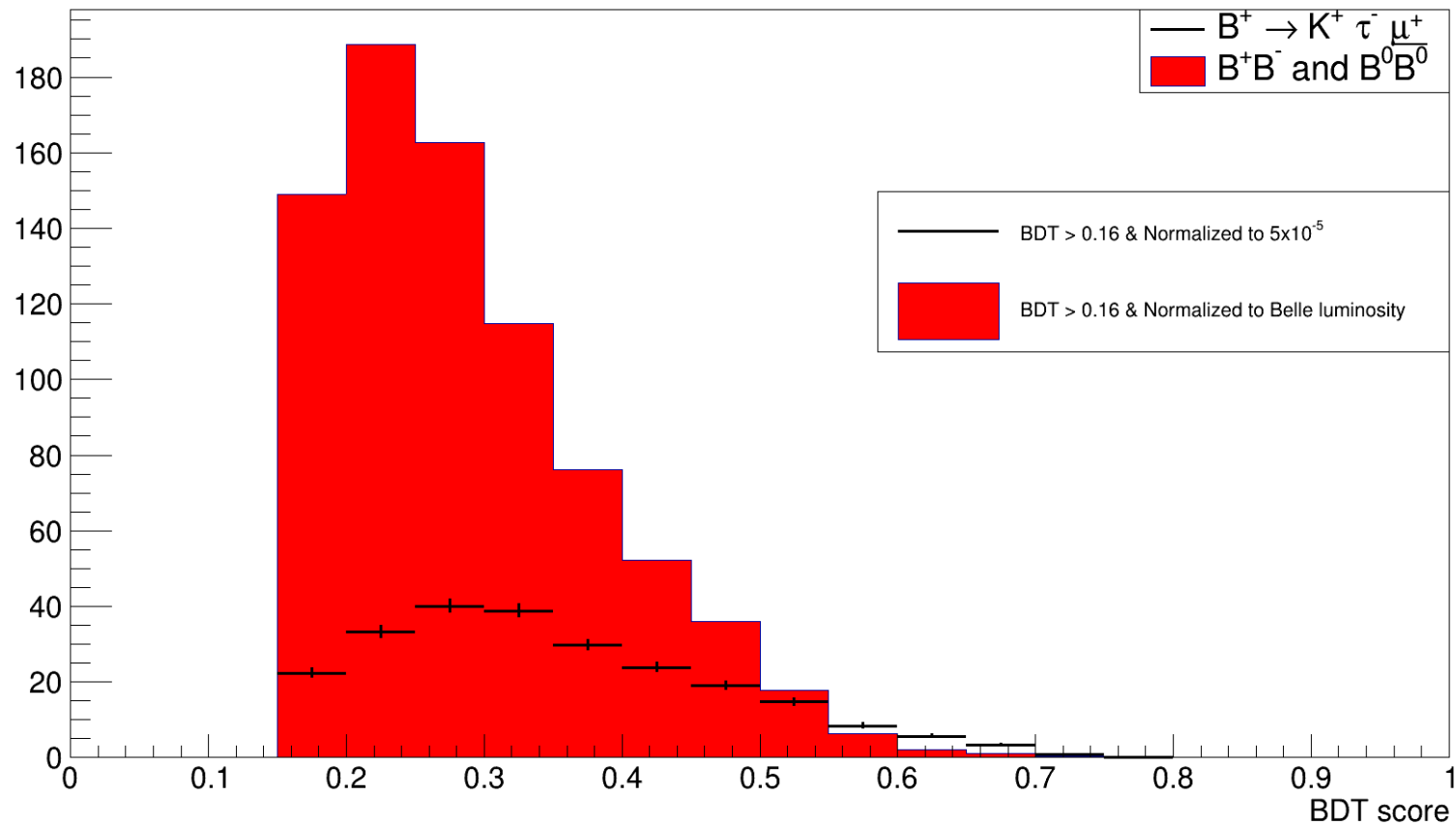
Background rejection versus Signal efficiency



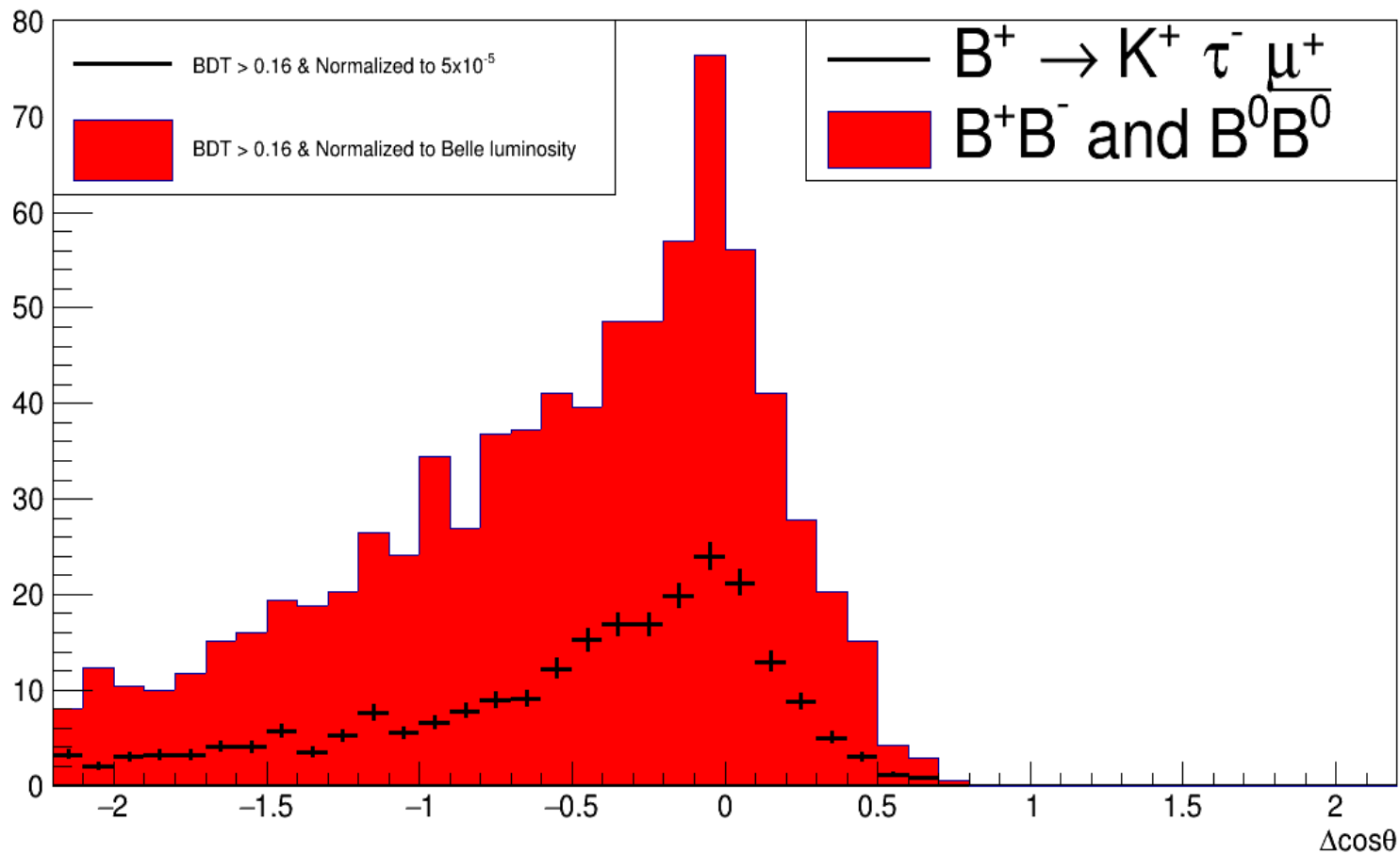
DataSet	MVA	ROC-integ
dataset	MLP	: 0.696
dataset	Fisher	: 0.693
dataset	BDT	: 0.666
dataset	BDTG	: 0.648

Normalization (without true match)

BDT response

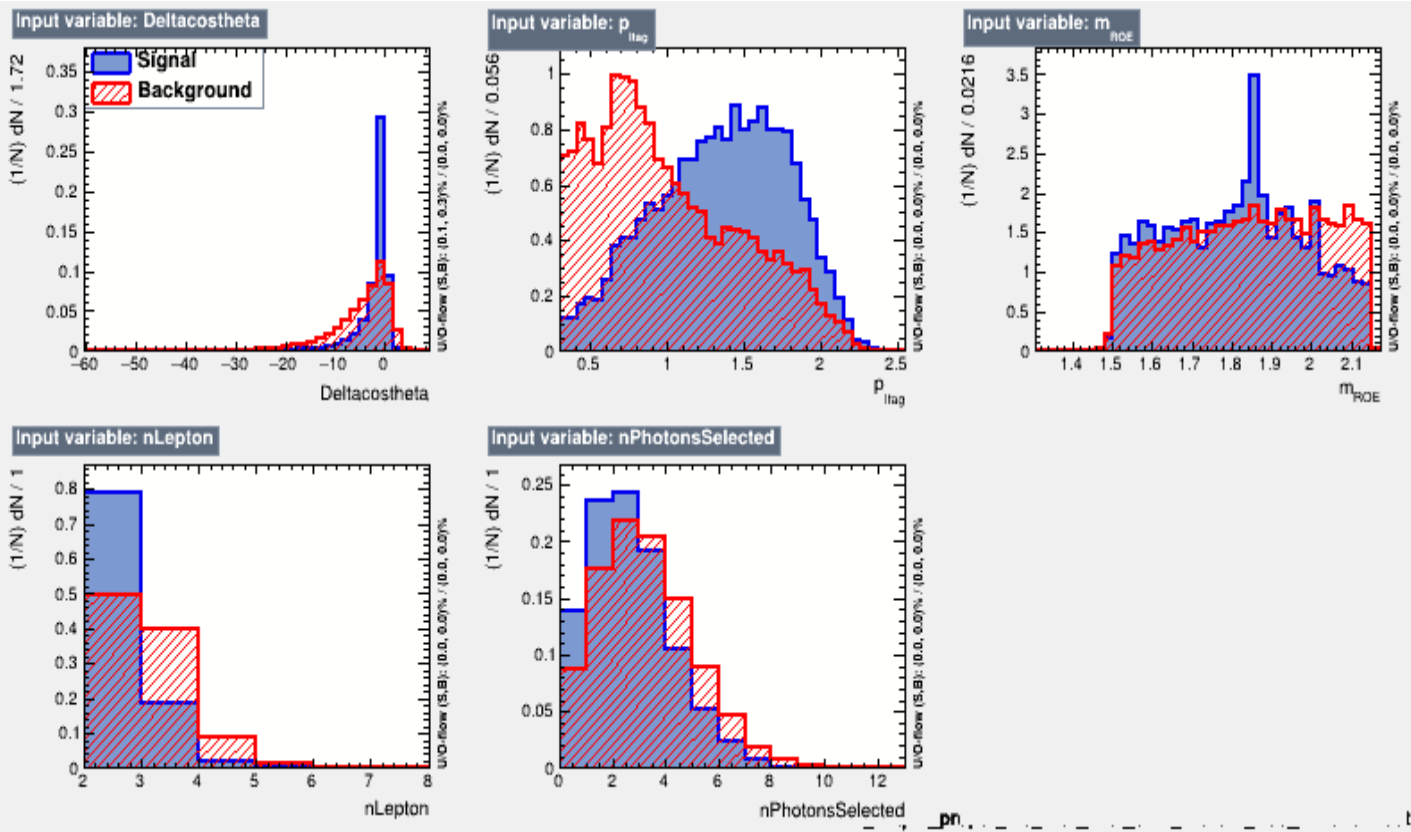


Best sum



Changing
MaxDepth=5 to MaxDepth = 3

Input Variables



Ranking result (top variable is best ranked)

Rank : Variable : Variable Importance

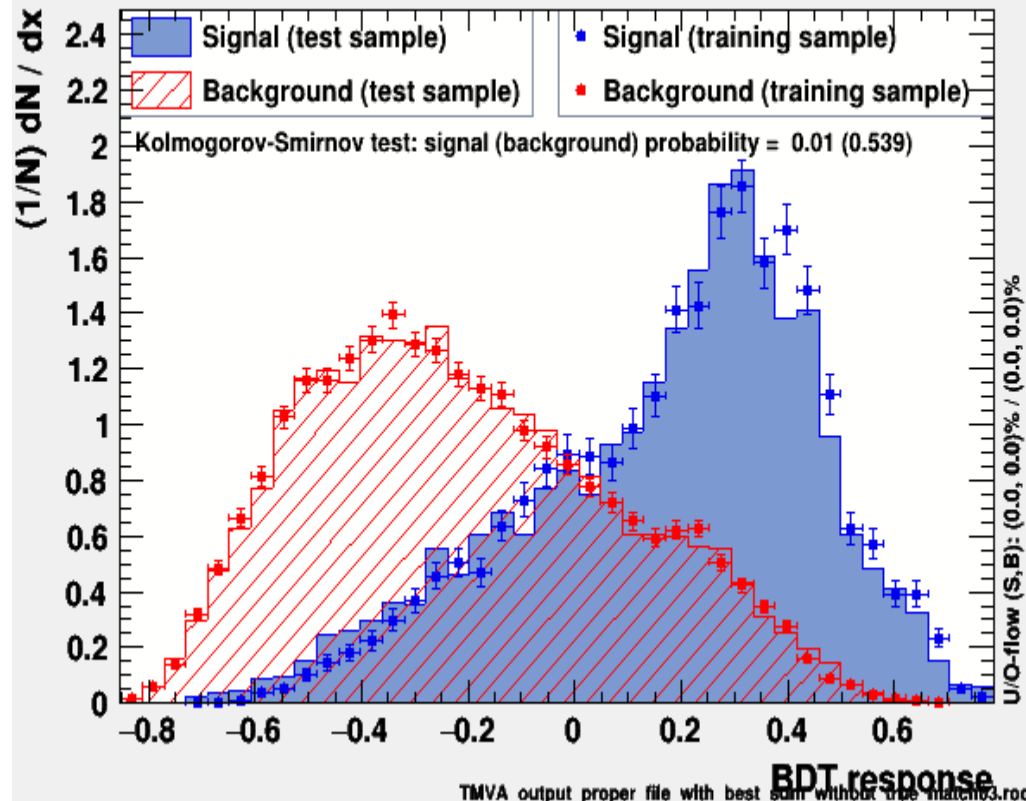
- 1 : p_{ltag} : 2.704e-01
- 2 : Deltacostheta : 2.395e-01
- 3 : nLepton : 1.964e-01
- 4 : m_{ROE} : 1.561e-01
- 5 : nPhotonsSelected : 1.375e-01

BDT response

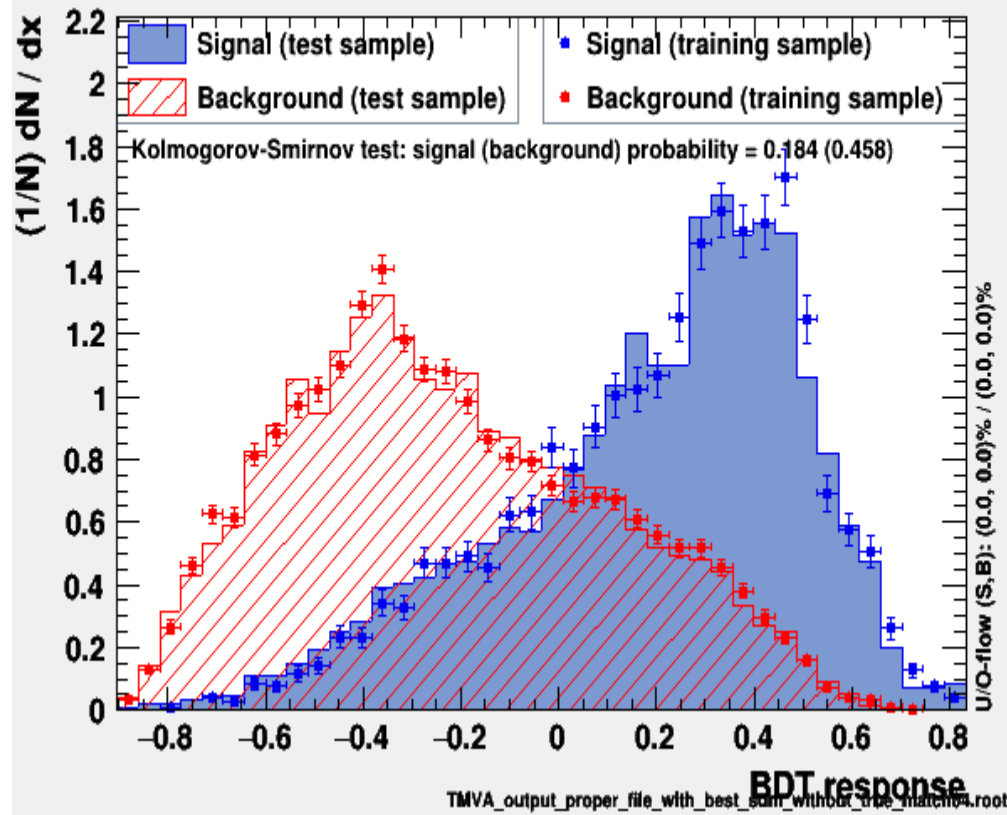
MaxDepth =5

MaxDepth =3

TMVA overtraining check for classifier: BDT



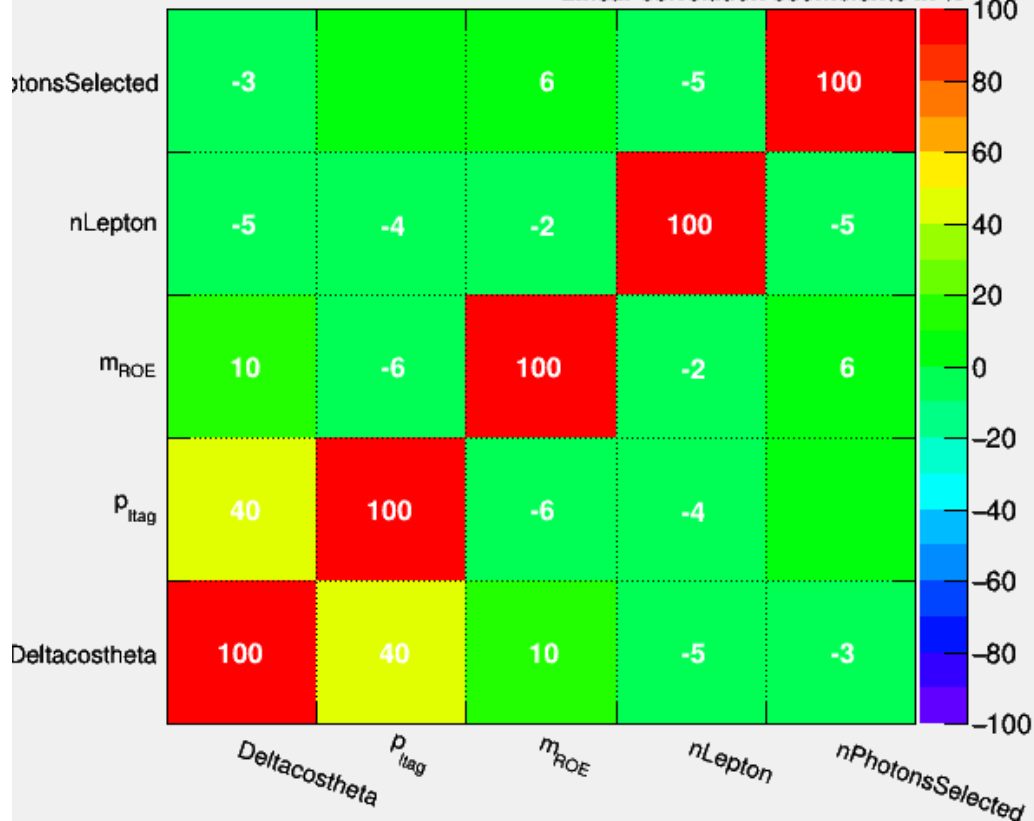
TMVA overtraining check for classifier: BDT



Correlation matrix

Correlation Matrix (signal)

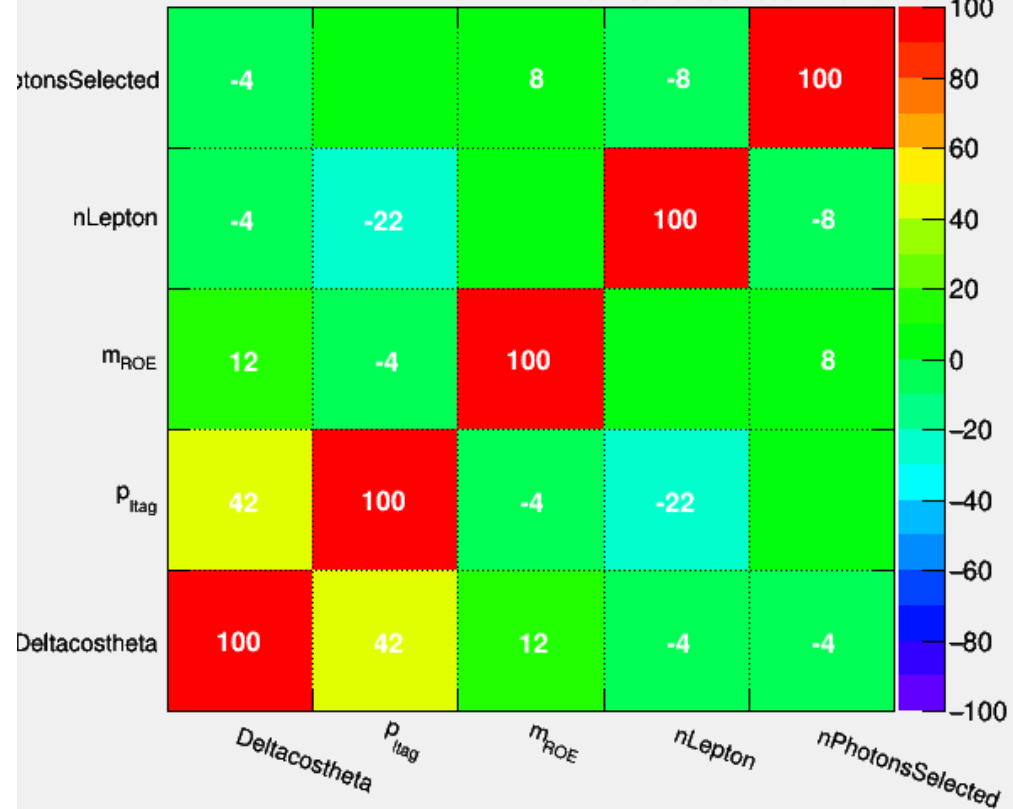
Linear correlation coefficients in %



TMVA_output_proper_file_with_best_sum_without_true_match04.root

Correlation Matrix (background)

Linear correlation coefficients in %



TMVA_output_proper_file_with_best_sum_without_true_match04.root