

TMVA: BDT trained on RecoTk1IP, RecoTk2IP, RecoTk3IP, RecoTK4IP from simulated ttbar samples

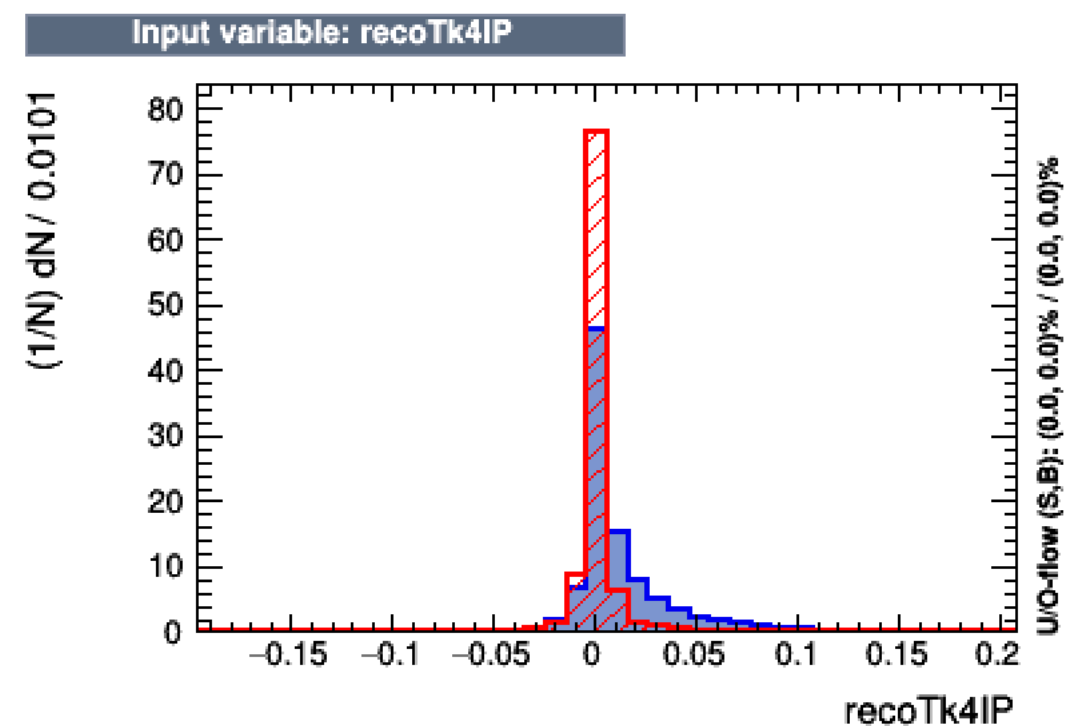
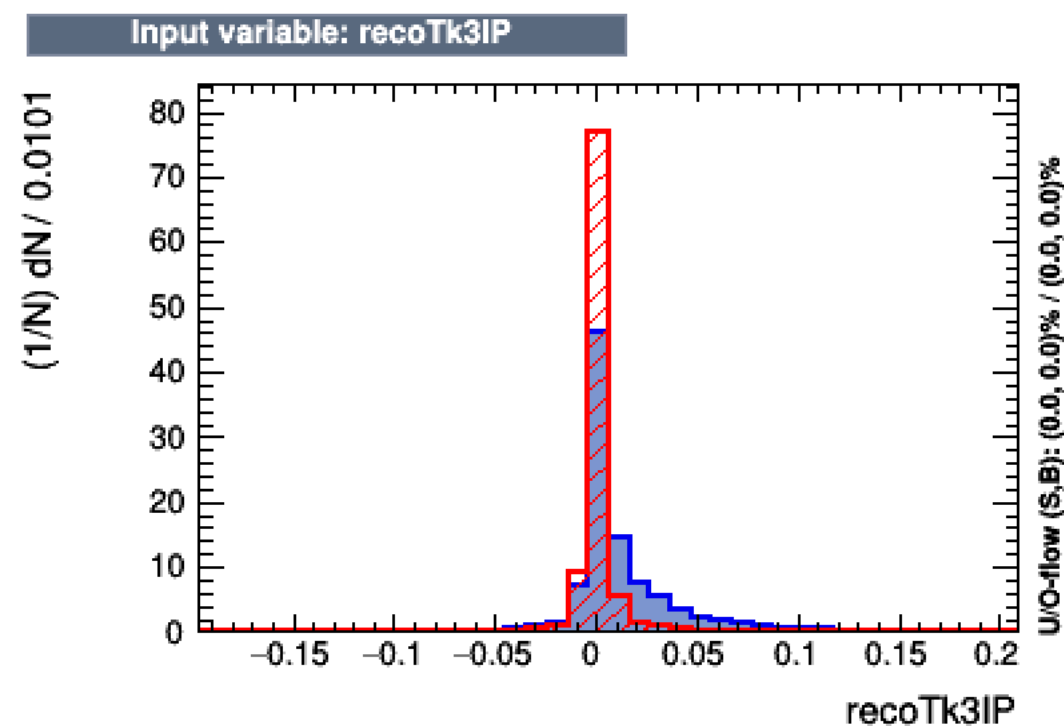
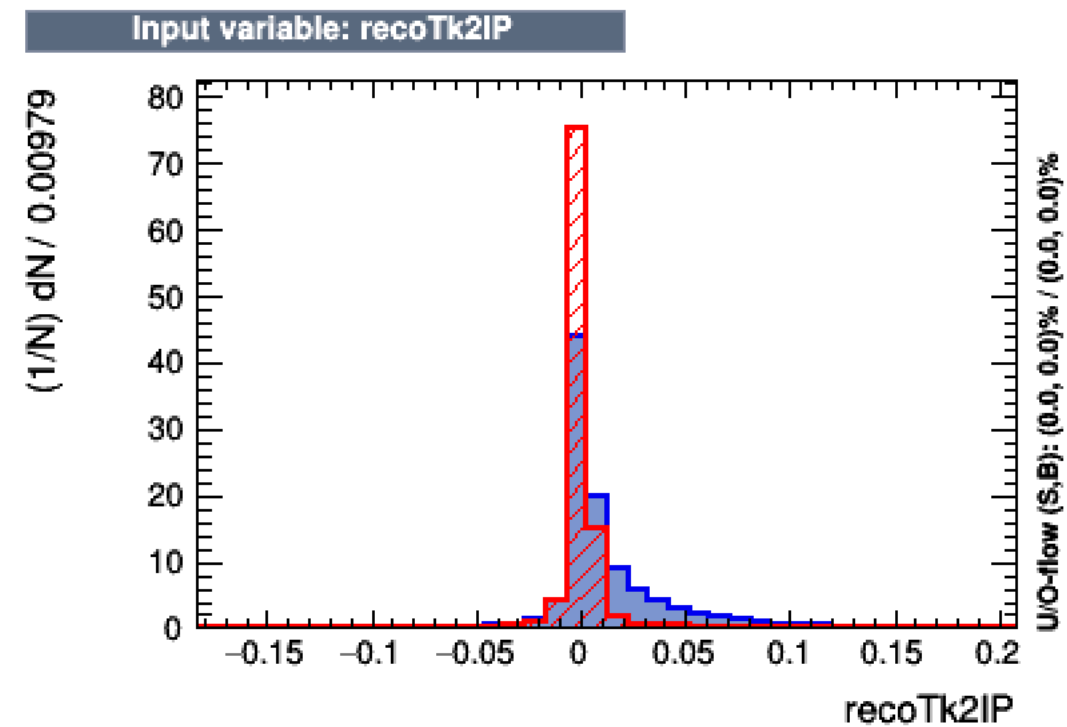
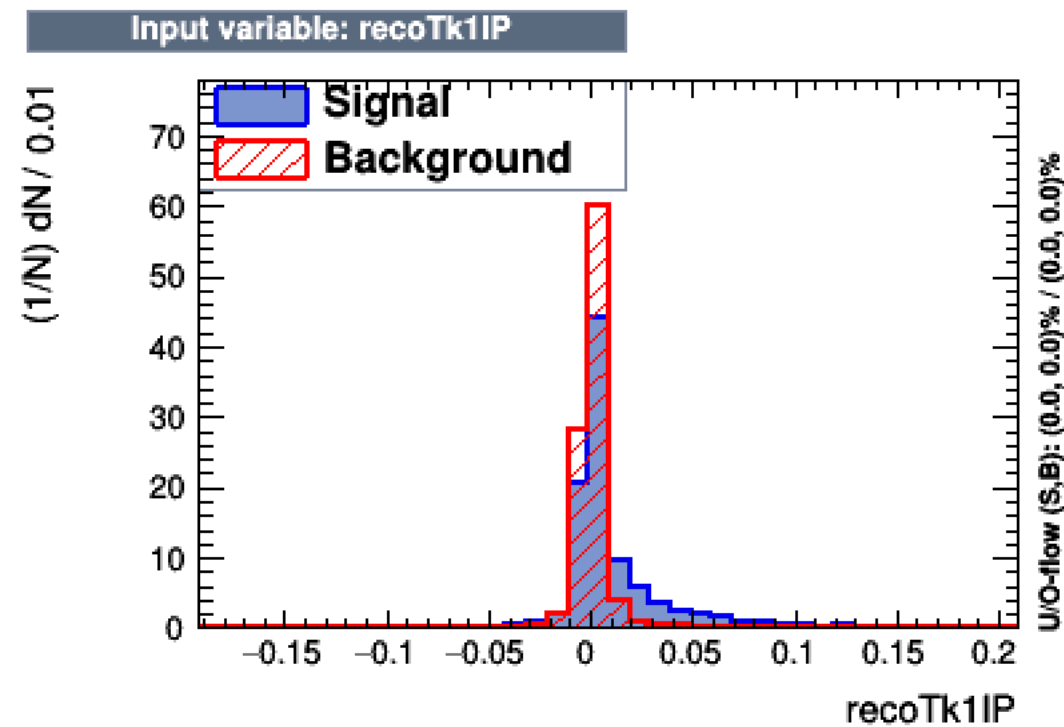
Aug 7, 2018

On output of
TMVAAAnalysis.C,
run

```
`root -l -e  
'TMVA::TMVAGui("output_ttbar.root")'  
`
```

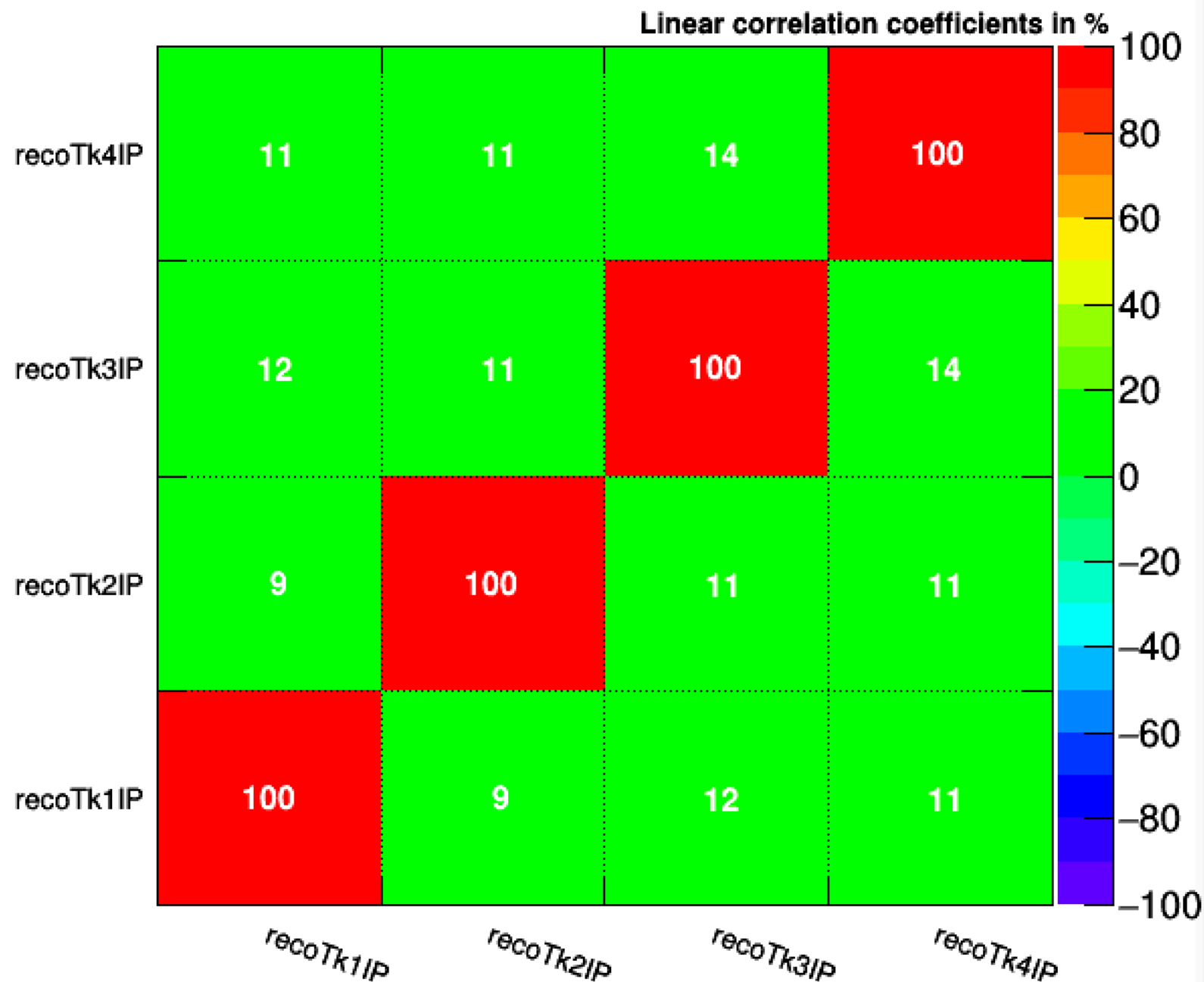
TMVA Plotting Macros for Classification
(1a) Input variables (training sample)
(2a) Input variable correlations (scatter profiles)
(3) Input Variable Linear Correlation Coefficients
(4a) Classifier Output Distributions (test sample)
(4b) Classifier Output Distributions (test and training samples superimposed)
(4c) Classifier Probability Distributions (test sample)
(4d) Classifier Rarity Distributions (test sample)
(5a) Classifier Cut Efficiencies
(5b) Classifier Background Rejection vs Signal Efficiency (ROC curve)
(5b) Classifier 1/(Backgr. Efficiency) vs Signal Efficiency (ROC curve)
(6) Parallel Coordinates (requires ROOT-version >= 5.17)
(7) PDFs of Classifiers (requires "CreateMVAPdfs" option set)
(8) Likelihood Reference Distributiouns
(9a) Network Architecture (MLP)
(9b) Network Convergence Test (MLP)
(10) Decision Trees (BDT)
(11) Decision Tree Control Plots (BDT)
(12) Plot Foams (PDEFoam)
(13) General Boost Control Plots
(14) Quit

1(a) Input variables (training sample)



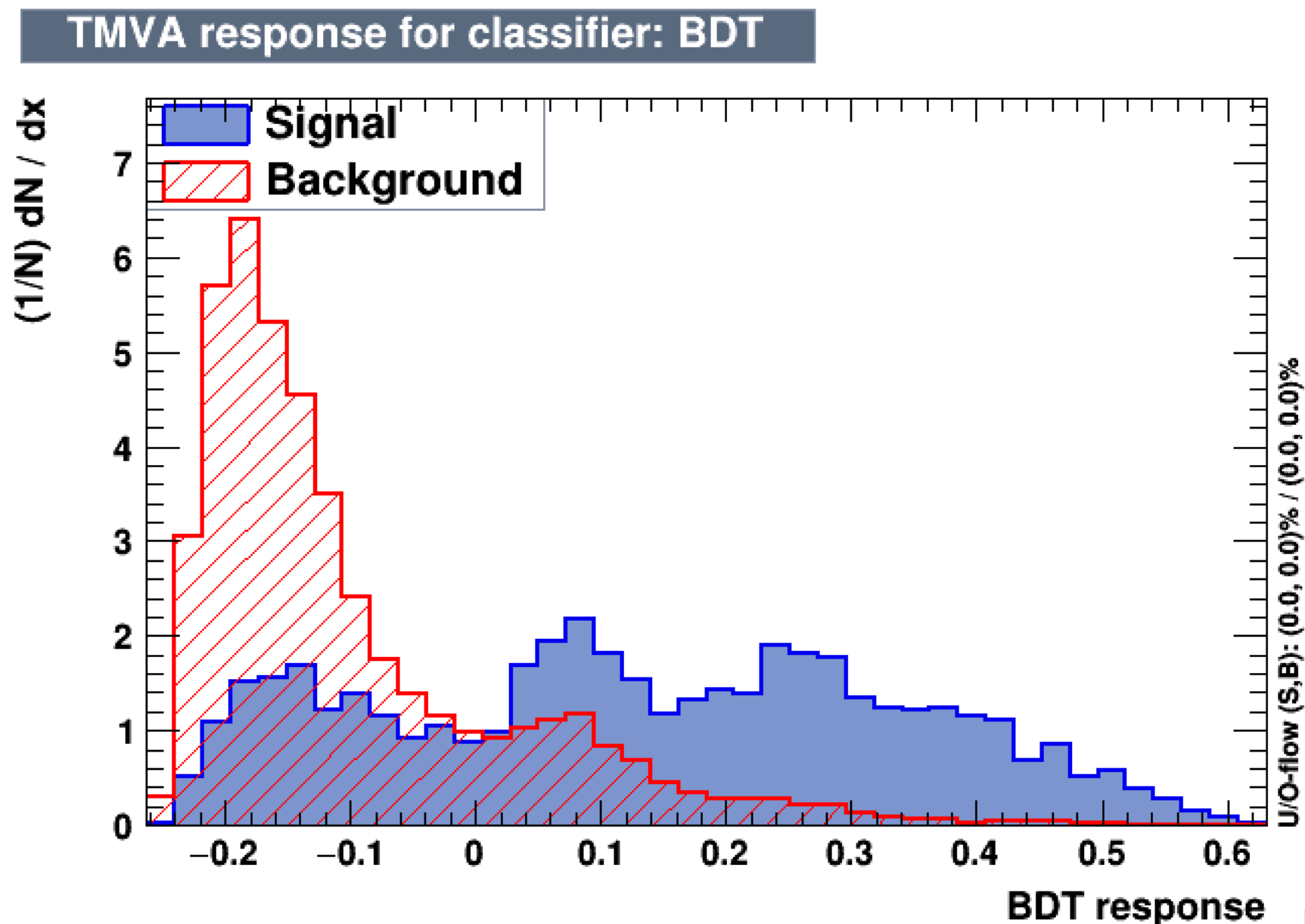
(3) Input Variable Linear Correlation Coefficients

Correlation Matrix (signal)



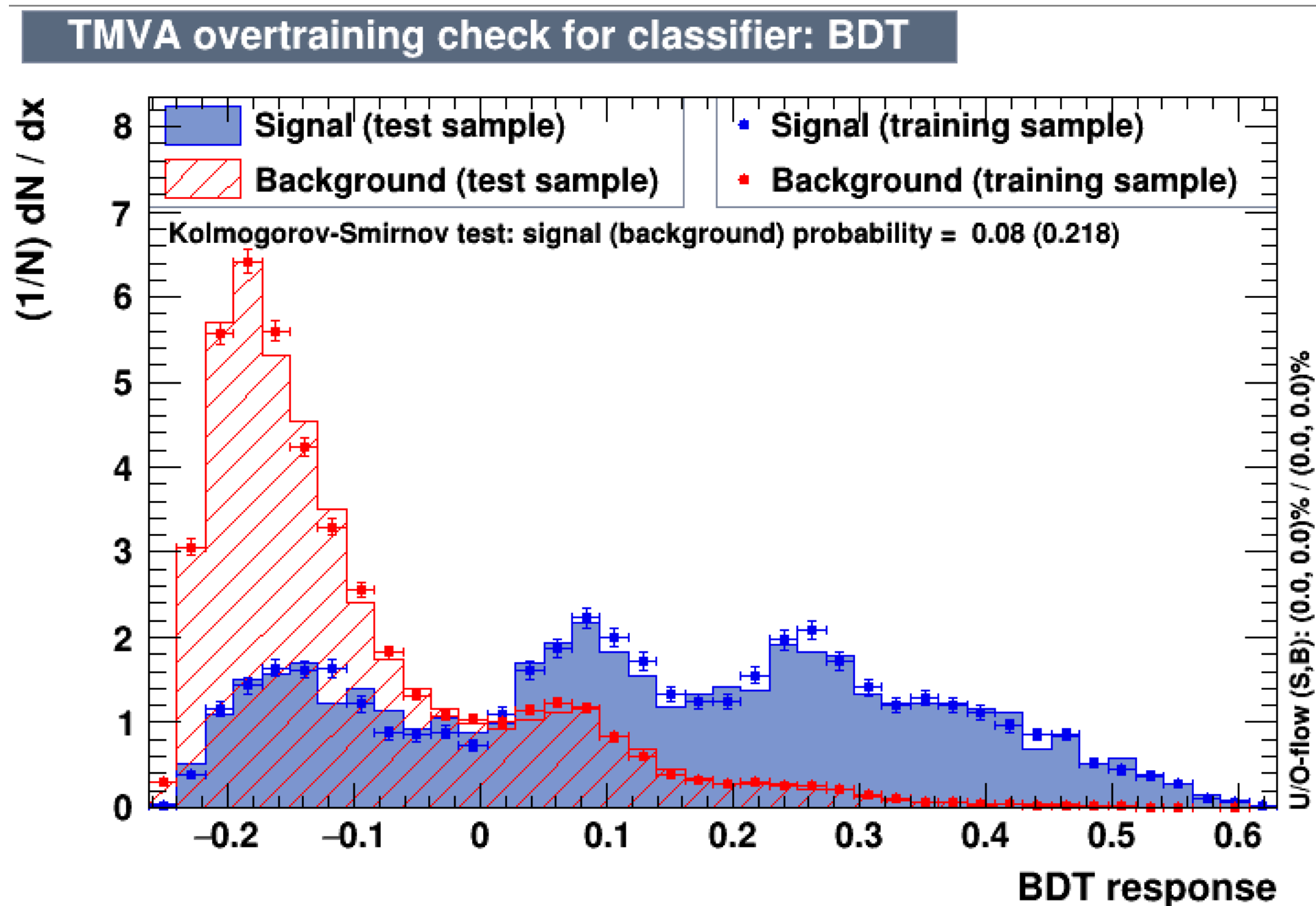
(4a) Classifier Output Distributions (test sample)

- More signal events have a higher BDT classifier value as expected



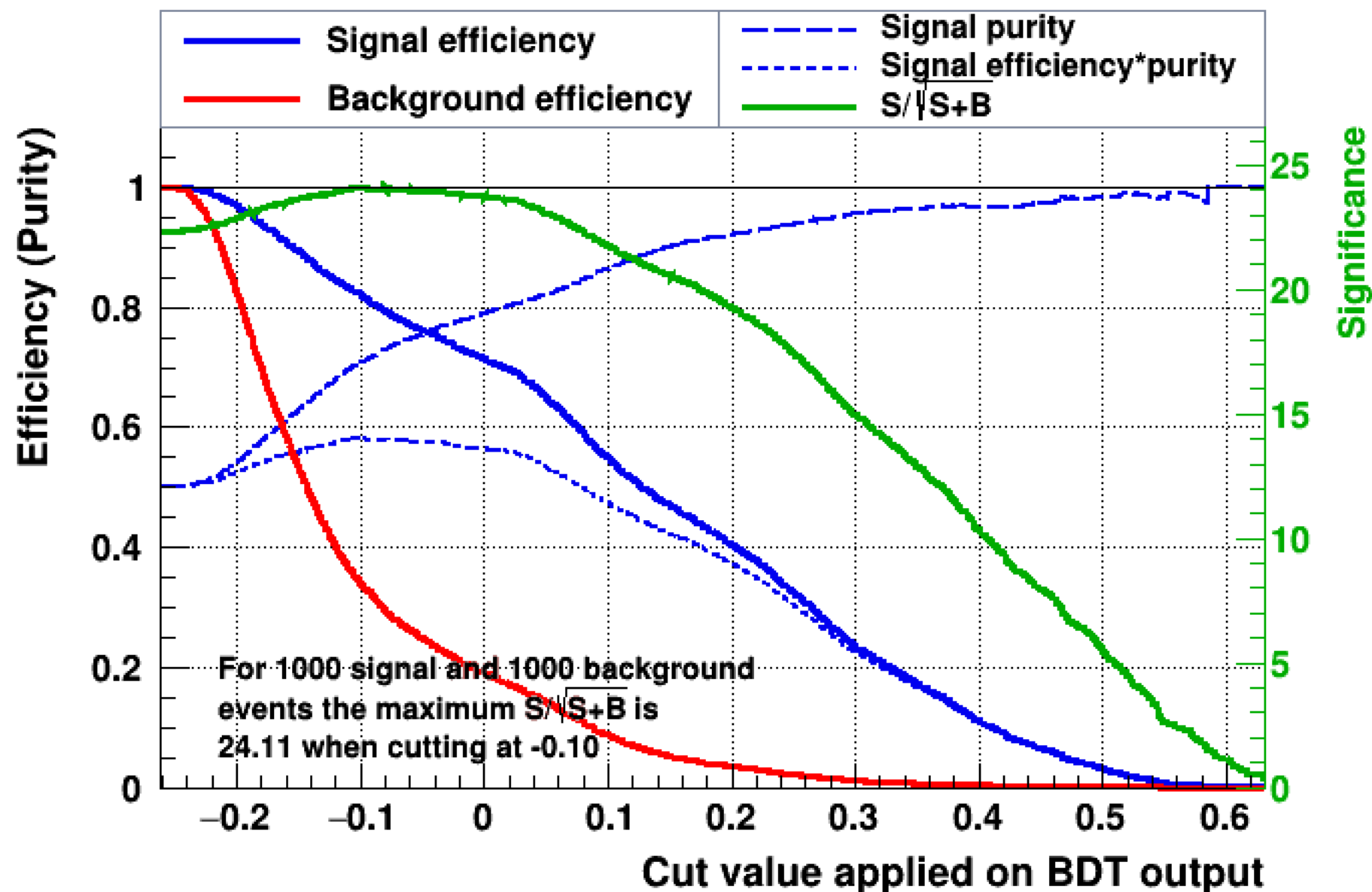
(4b) Classifier Output Distributions (test and training samples superimposed)

- A warning sign of overtraining is when the training/test BDT responses don't match up: **some of the training/test values are different**



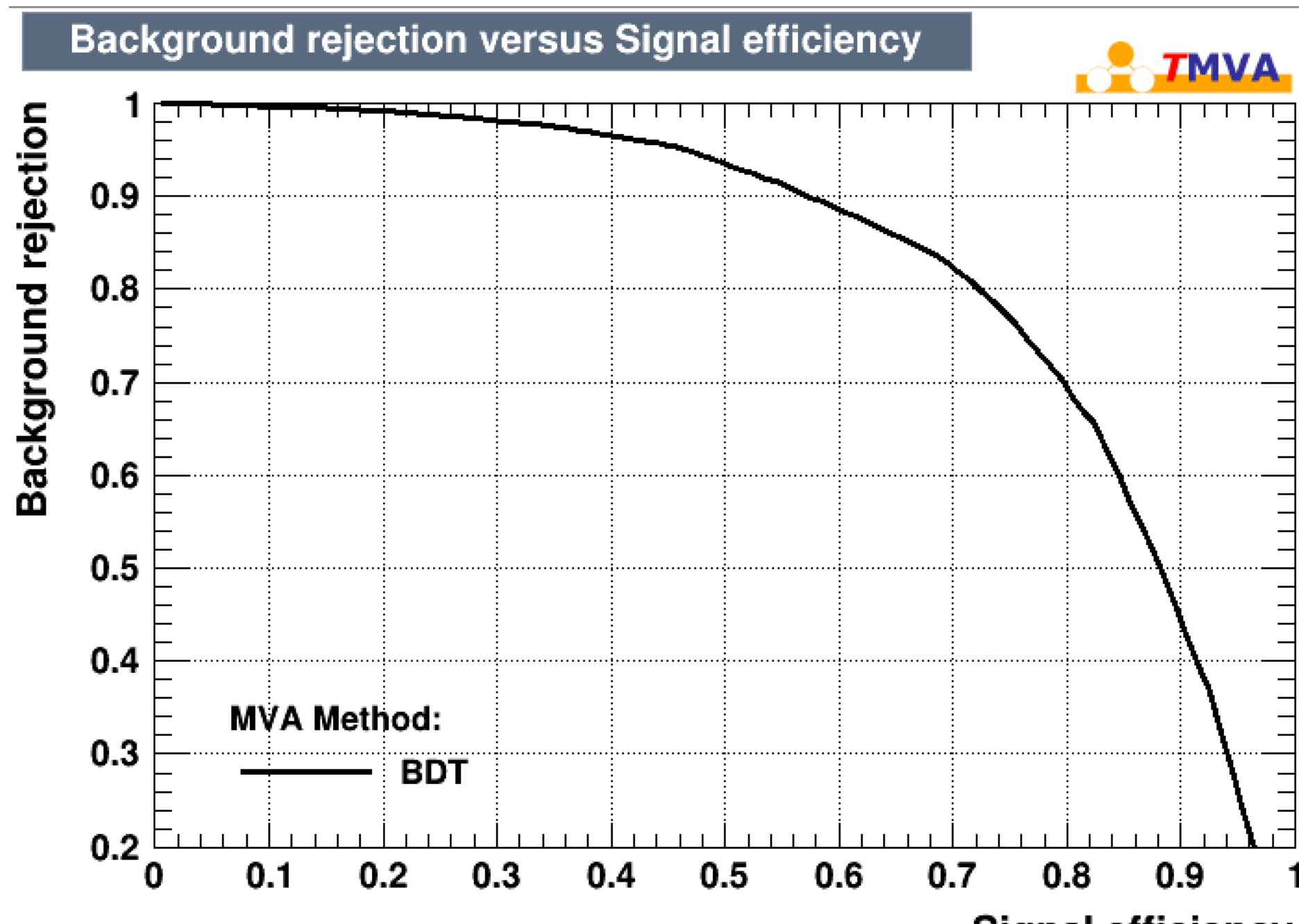
(5a) Classifier Cut Efficiencies

Cut efficiencies and optimal cut value



(5b) Classifier Background Rejection vs Signal Efficiency (ROC curve)

- More detailed metrics are in the logRun file



(10) Decision Trees (BDT)

