

Super-short update

Single top $tH \rightarrow$ same sign dilepton

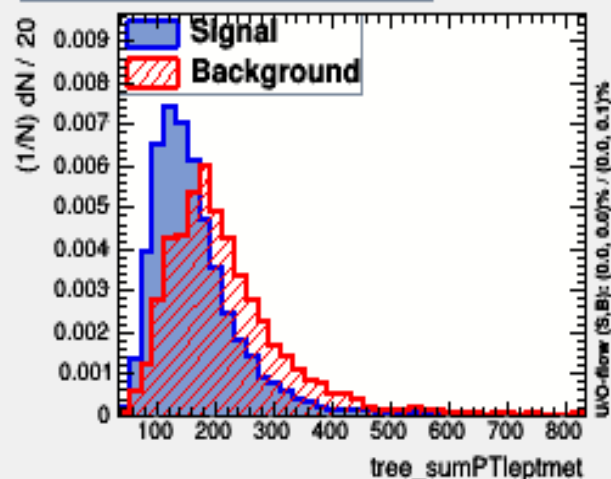
Object and event selection

- Lepton selection :
 - $p_T > 10 \text{ GeV}$, $|\eta| < 2.5$,
 - Combined isolation (cone of 0.4) < 0.2 for both electrons and muons.
- Jet selection :
 - $p_T > 30 \text{ GeV}$, $|\eta| < 2.5$, $E_{\text{E}}/E_{\text{H}} < 0.3$,
 - Remove selected leptons from the jet collection.
 - Btagging : loose WP.
- Charge mis-reconstruction of electrons 0.3 % in the endcap, 0.03 % in the barrel (from ttH CMS paper).
- Event selection :
 - Exactly 1 selected leptons,
 - Same sign leptons, leading lepton $p_T > 20 \text{ GeV}$, other lepton $p_T > 10 \text{ GeV}$, $M_{\text{ll}} > 12$.
- At least one selected jet.
- Exactly one b-tagged jet.

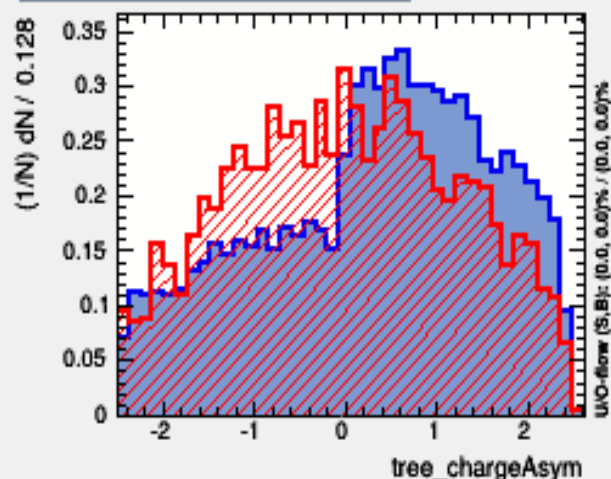
Cut flow (very first results)

Cut	tHToWW-Kappa-hut	TTdilep_nadspin	Summ bckg
no sel	64656.5 ± 64.2	7439298.5 ± 2304.7	7439298.5 ± 2304.7
2 lept	5197.2 ± 18.3	1764931.0 ± 1147.0	1764931.0 ± 1147.0
same sign	5158.9 ± 18.2	9040.2 ± 82.4	9040.2 ± 82.4
Z mass veto	4264.6 ± 16.5	7059.8 ± 72.8	7059.8 ± 72.8
>= 1 jets	3704.2 ± 15.4	6344.4 ± 69.0	6344.4 ± 69.0
=1 bjet	2310.5 ± 12.2	3607.9 ± 52.0	3607.9 ± 52.0

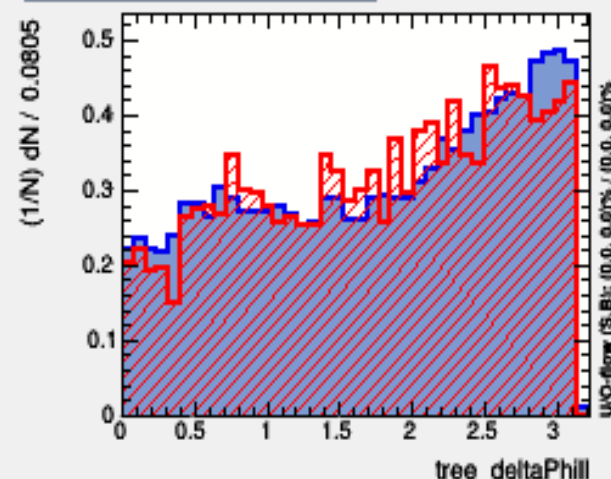
Input variable: tree_sumPTleptmet



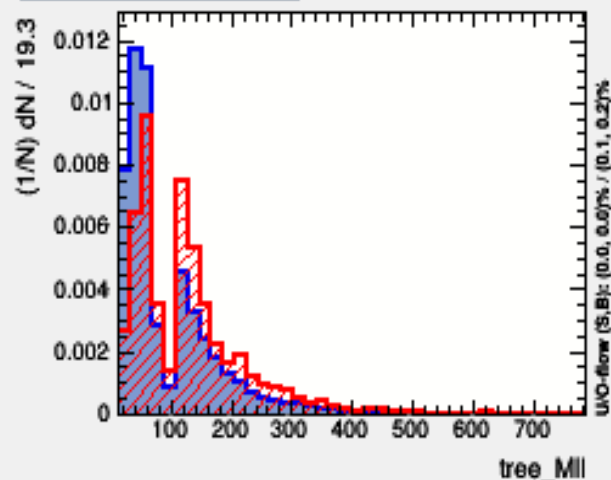
Input variable: tree_chargeAsym



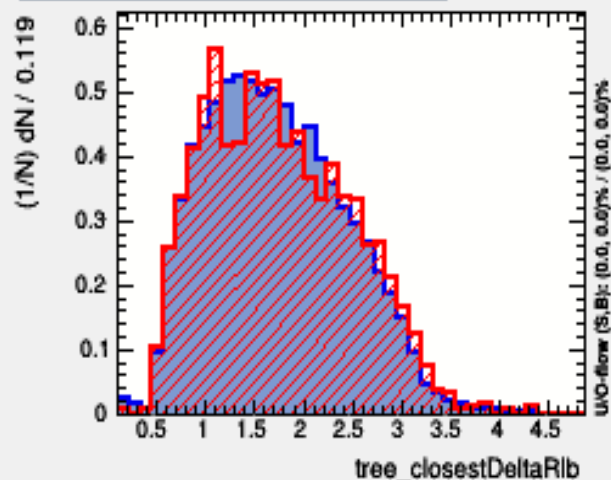
Input variable: tree_deltaPhll



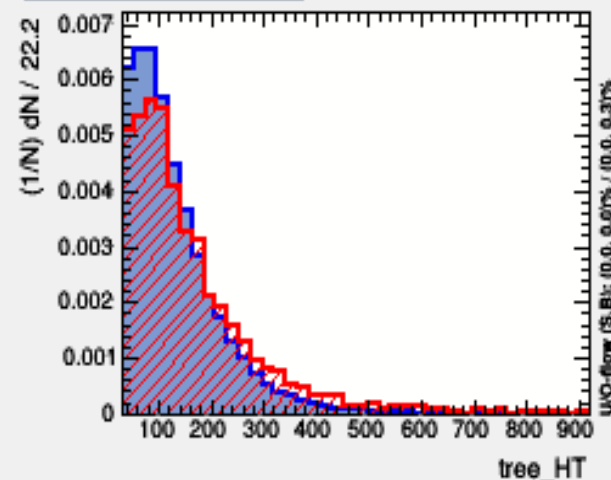
Input variable: tree_Mll



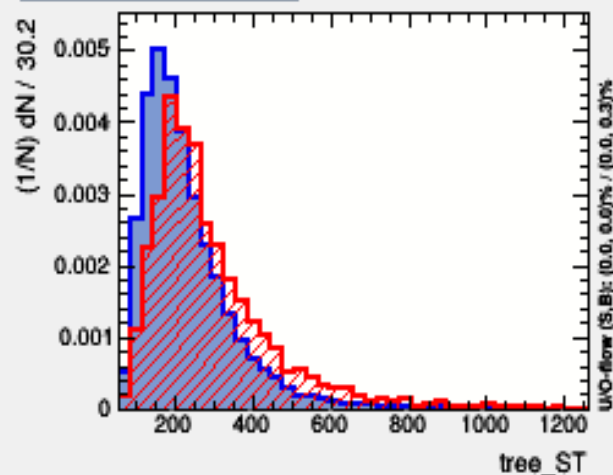
Input variable: tree_closestDeltaRib



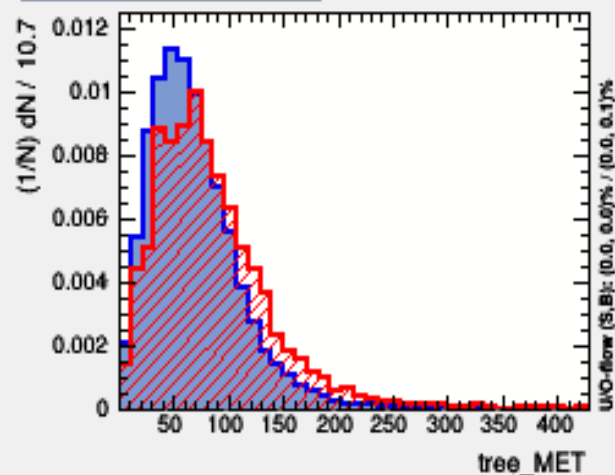
Input variable: tree_HT



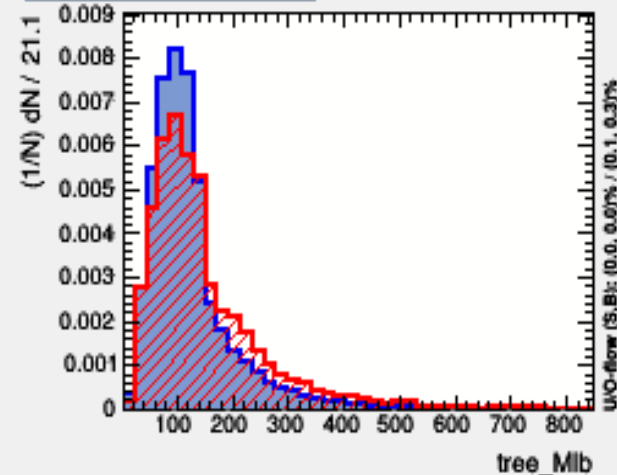
Input variable: tree_ST



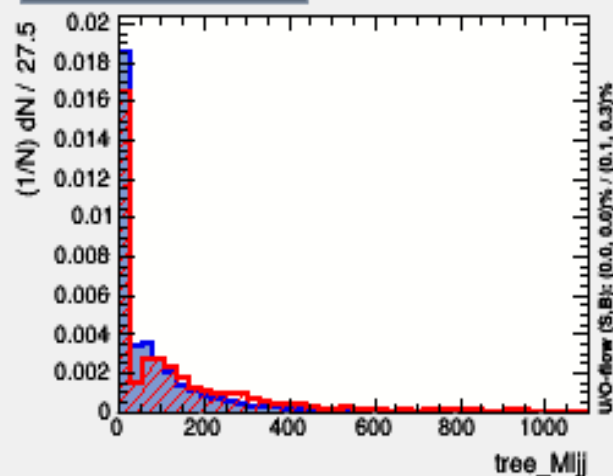
Input variable: tree_MET



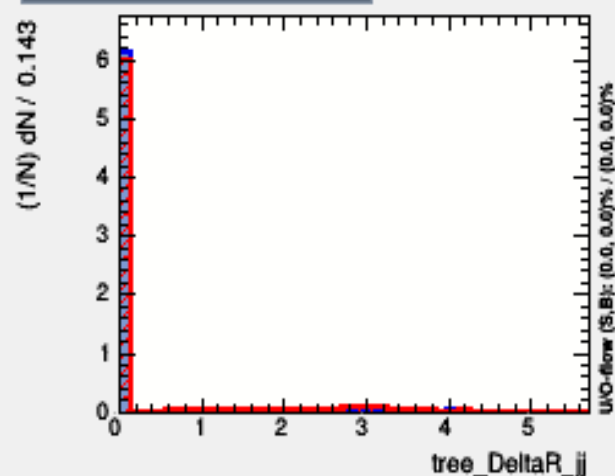
Input variable: tree_Mlb



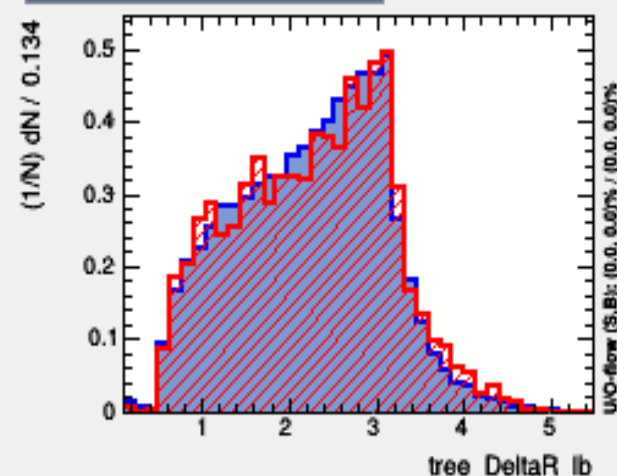
Input variable: tree_Mljj



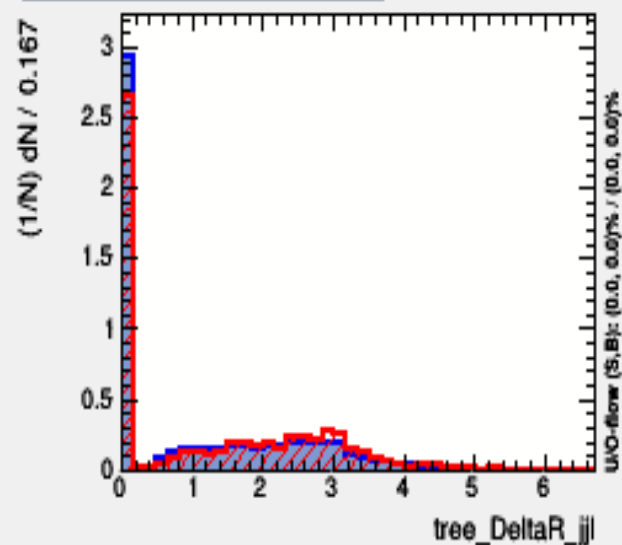
Input variable: tree_DeltaR_jj



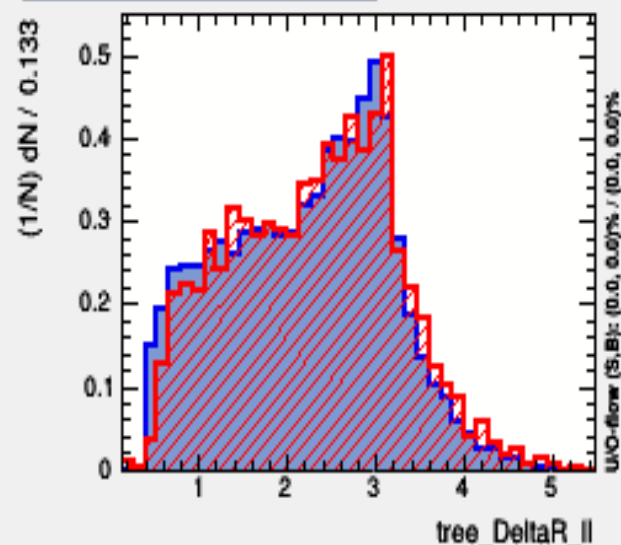
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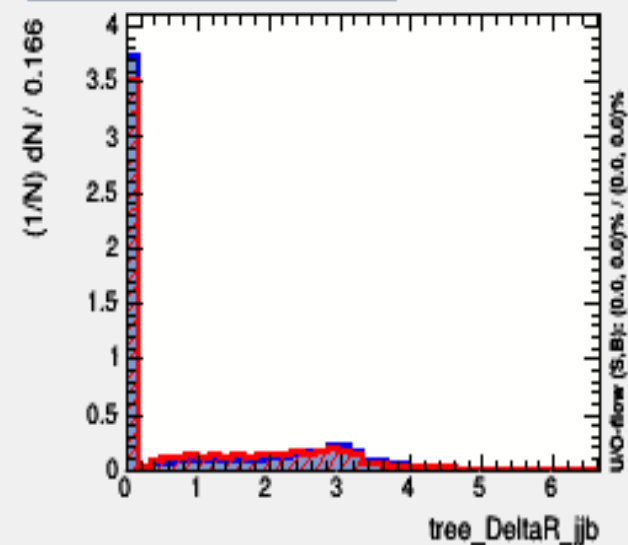
Input variable: tree_DeltaR_jjl



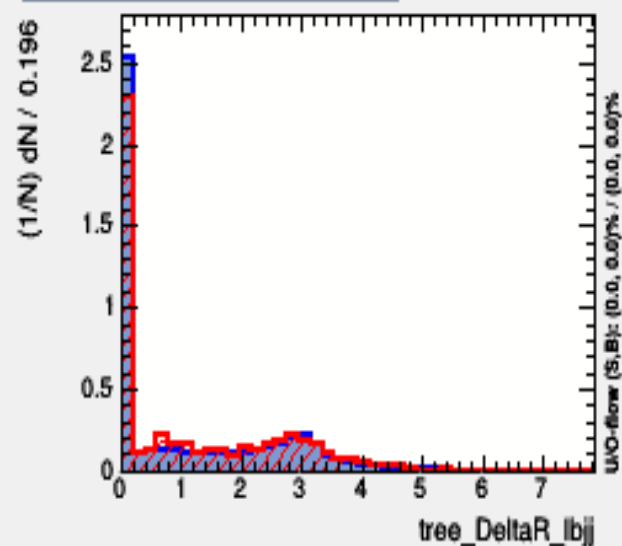
Input variable: tree_DeltaR_ll



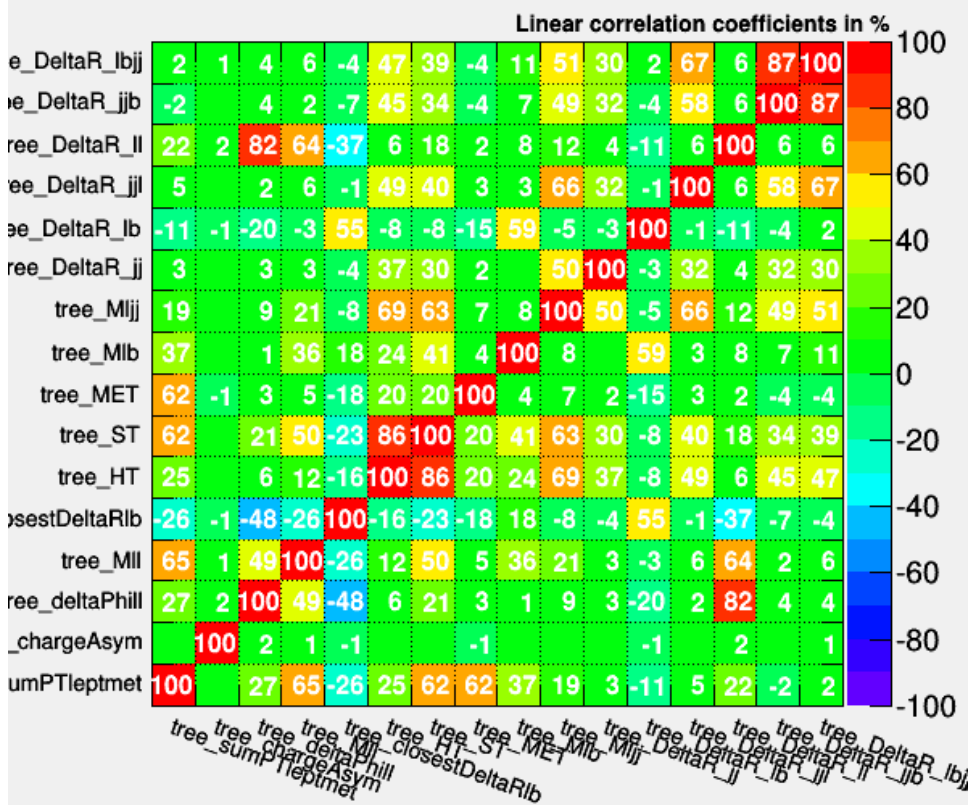
Input variable: tree_DeltaR_jjb



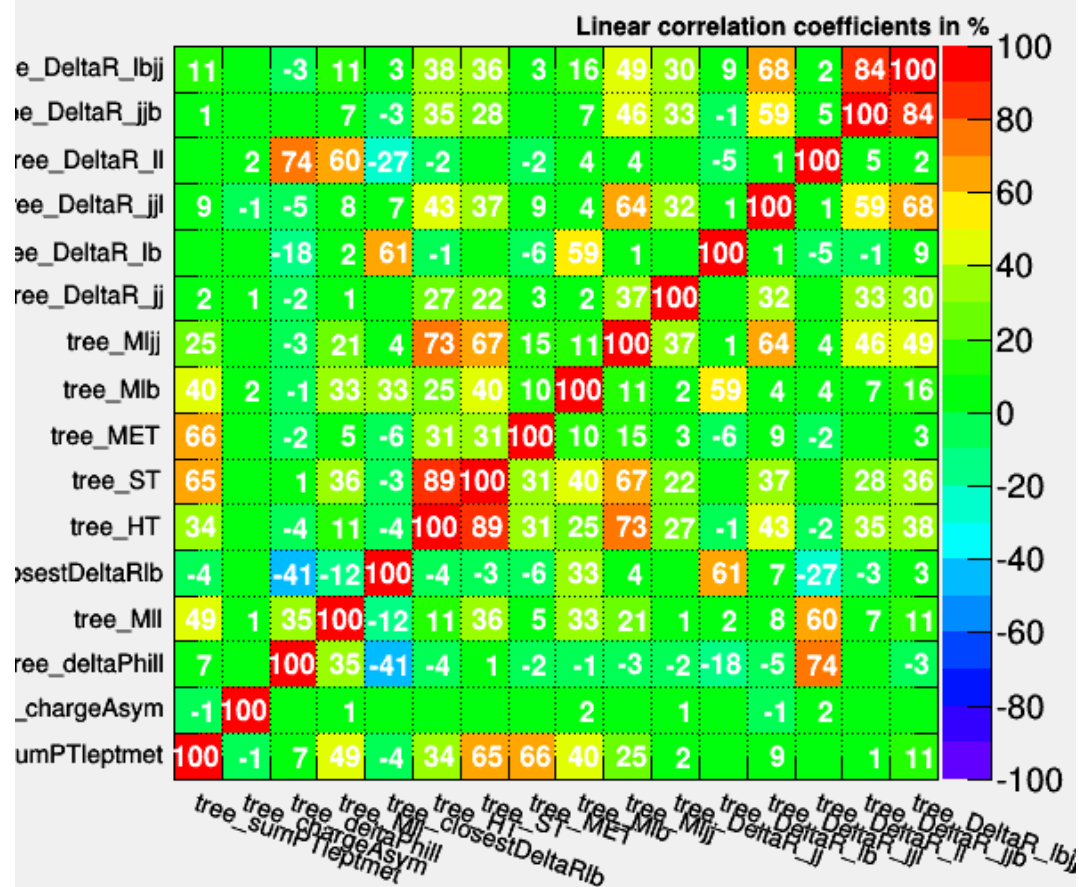
Input variable: tree_DeltaR_lbjj



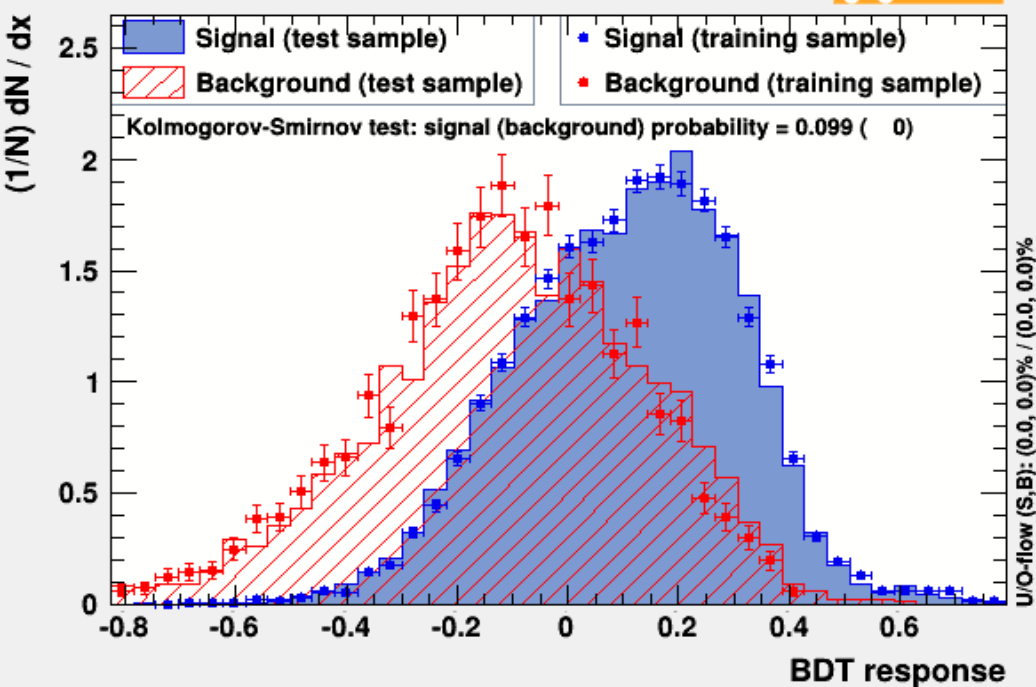
Correlation Matrix (signal)



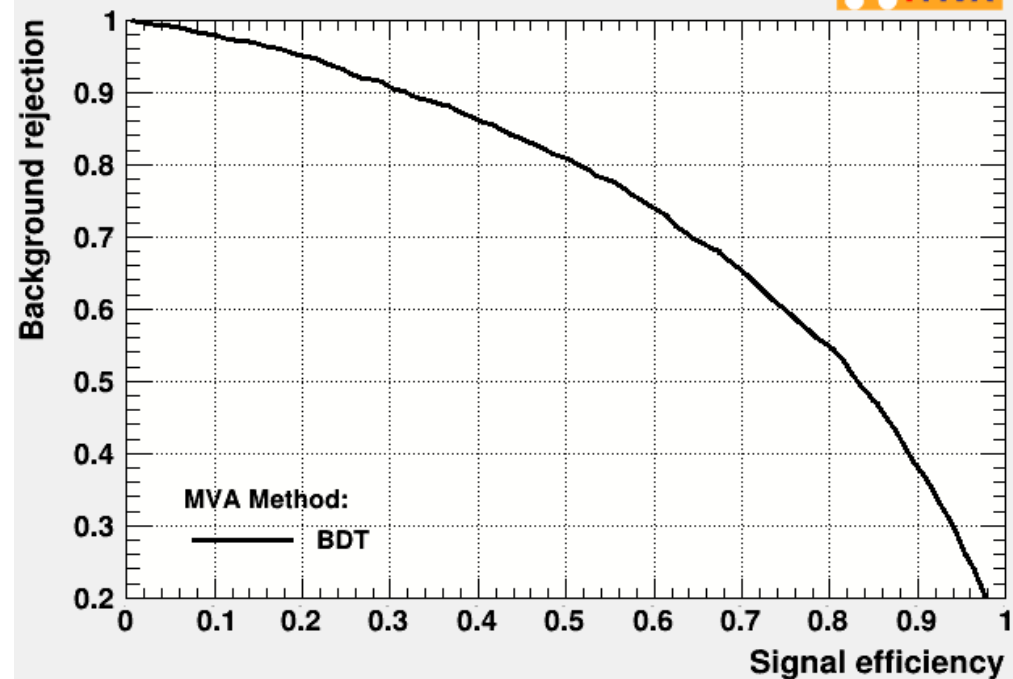
Correlation Matrix (background)



TMVA overtraining check for classifier: BDT



Background rejection versus Signal efficiency



Cut efficiencies and optimal cut value

