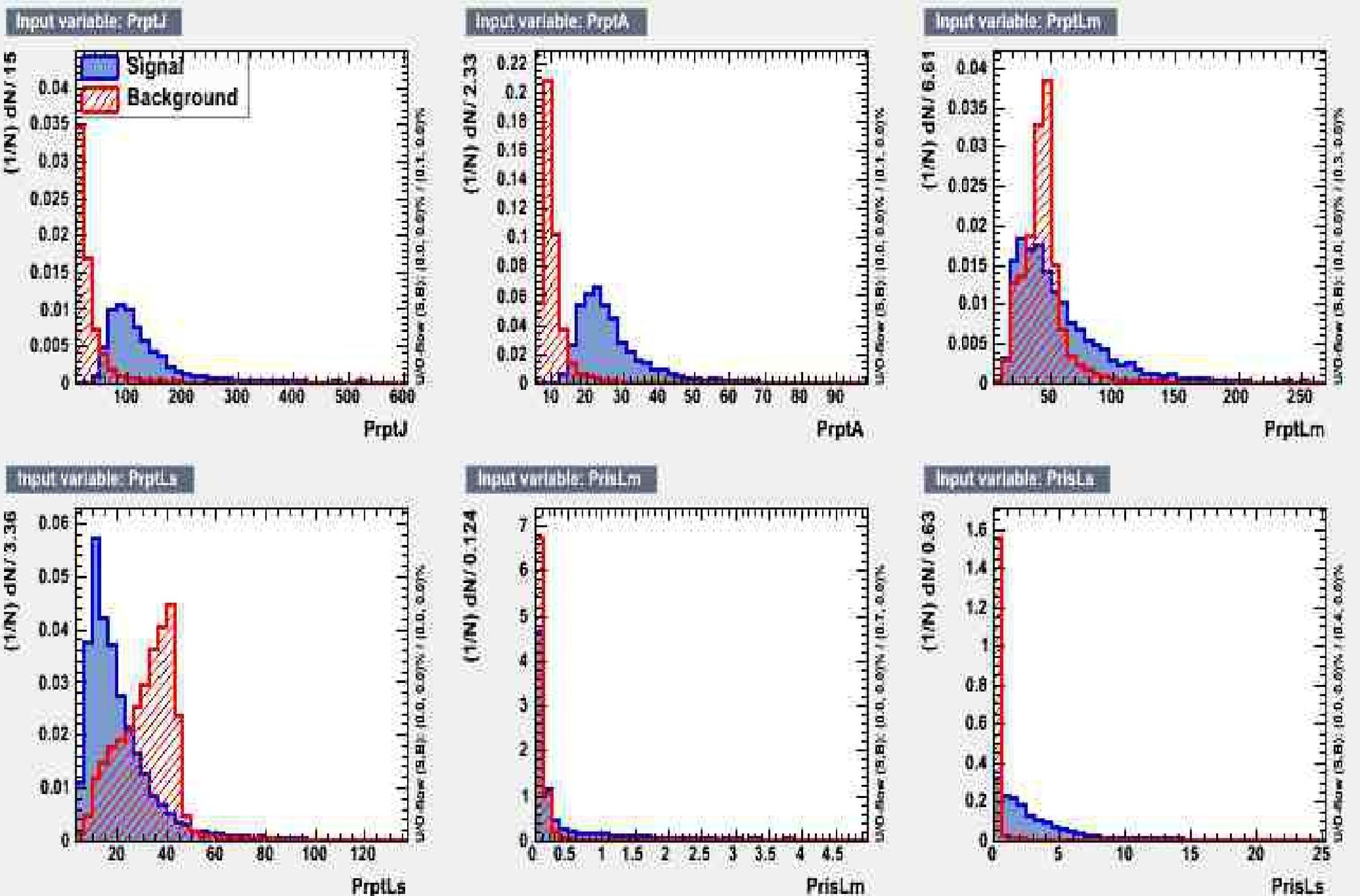
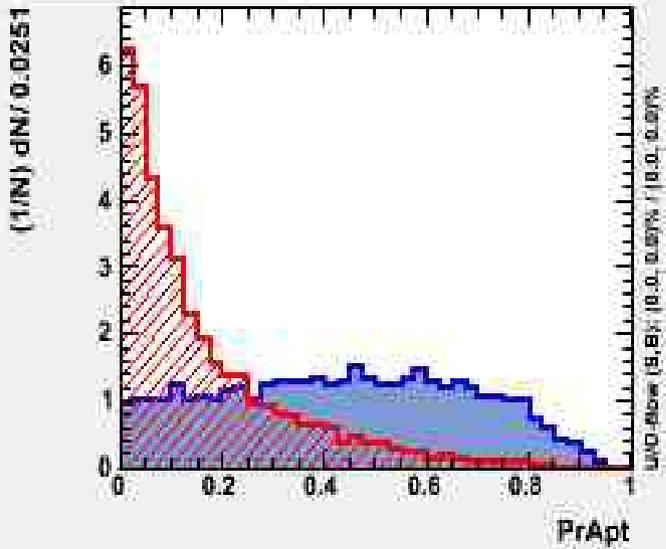


Preselezione contro DY



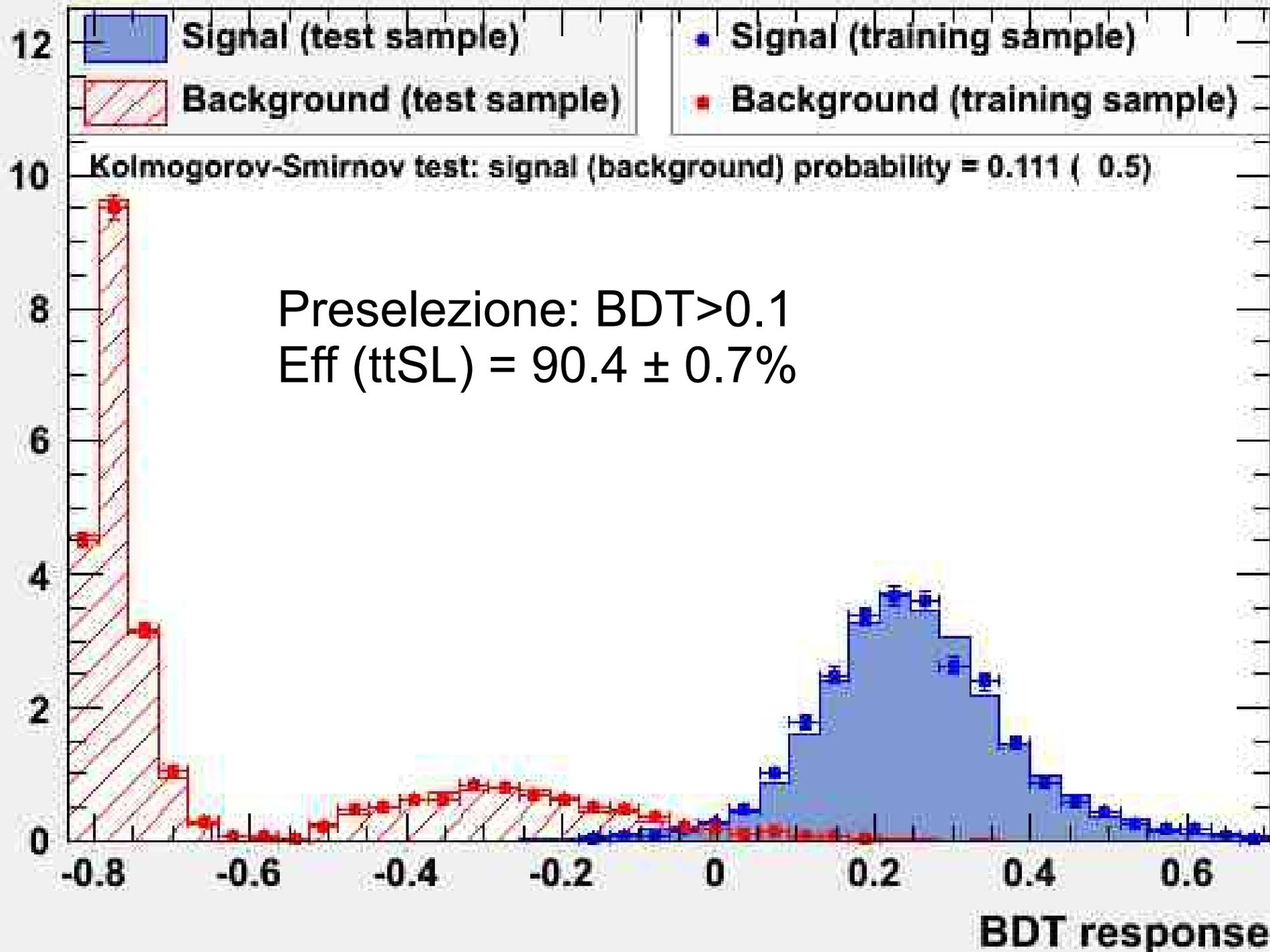
Preselezione contro DY

input variable: PrApt

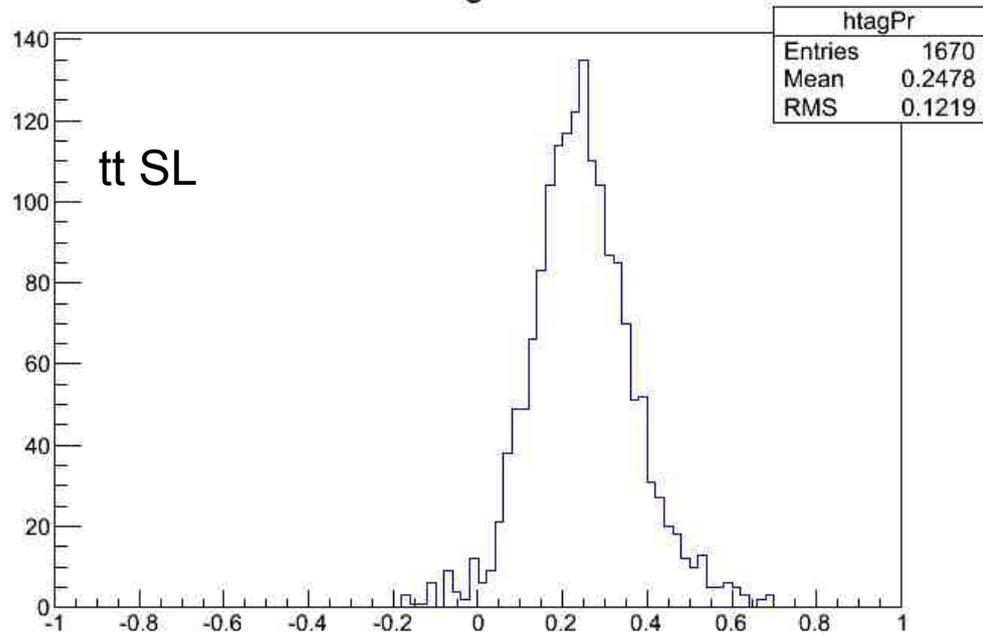


TMVA overtraining check for classifier: BDT

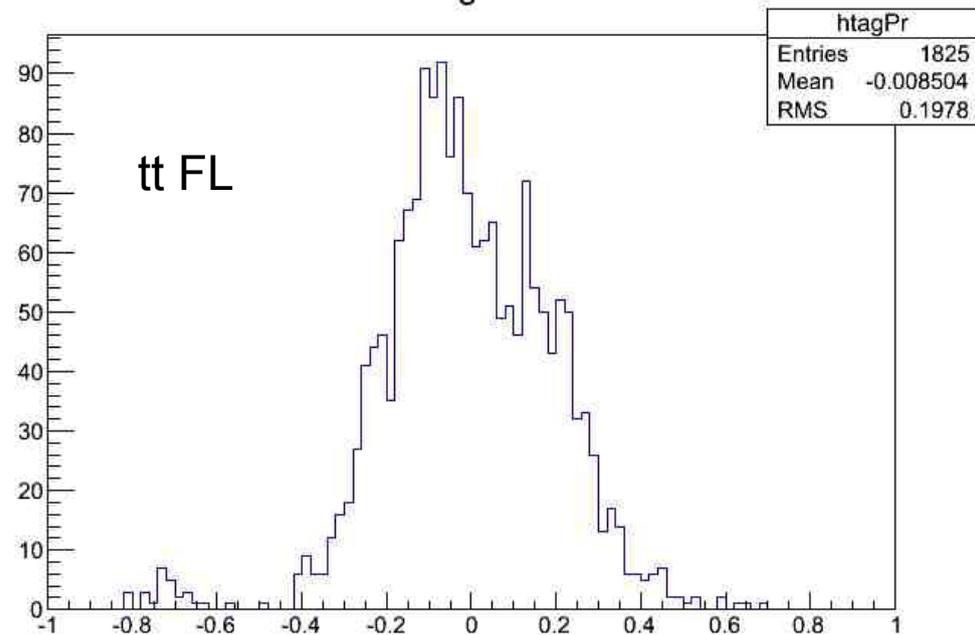
$x_p / N_p \cdot dN / dx$



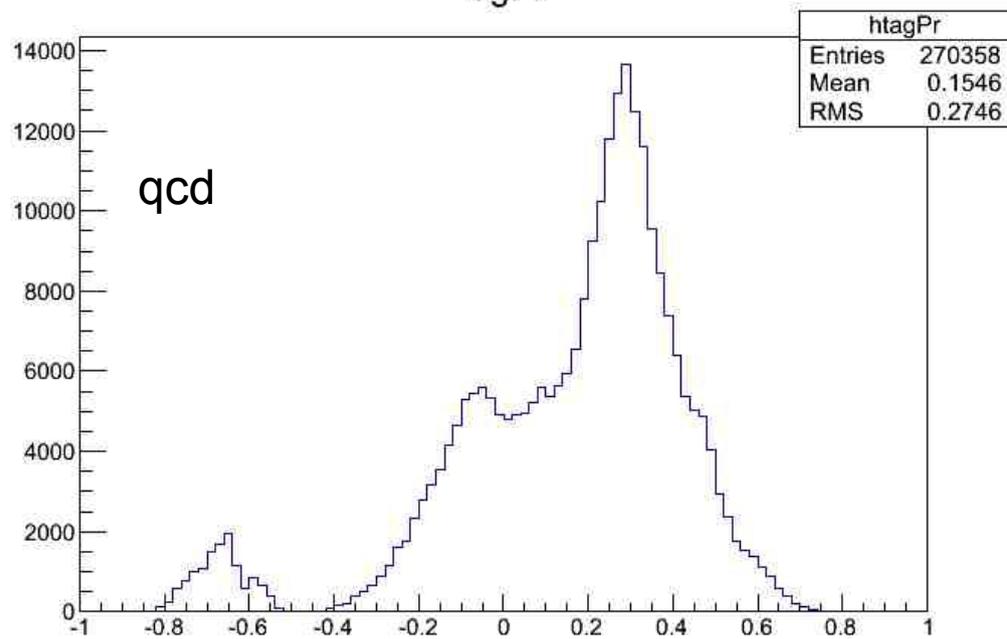
tagPr



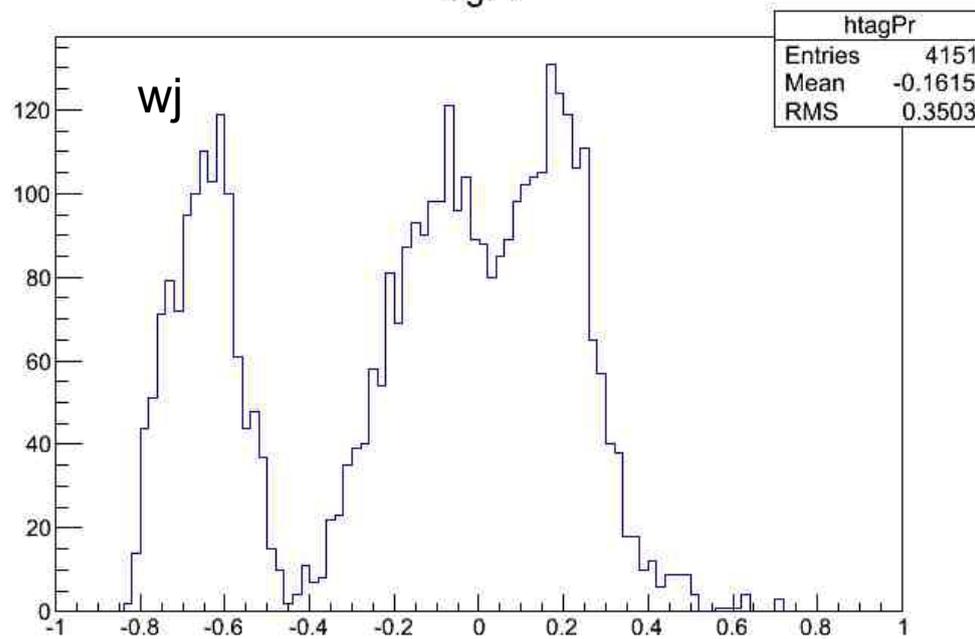
tagPr



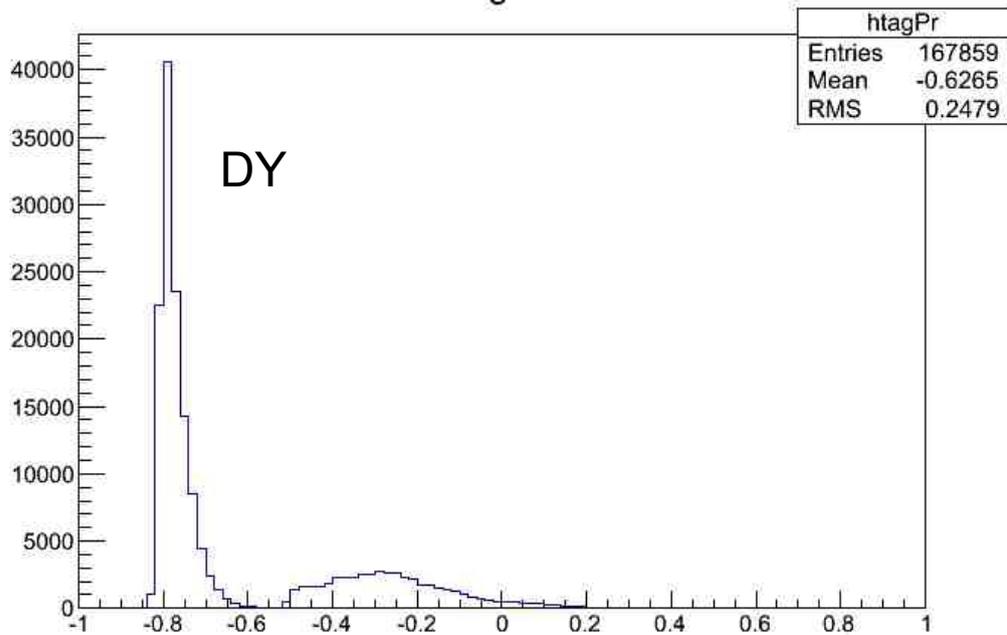
tagPr



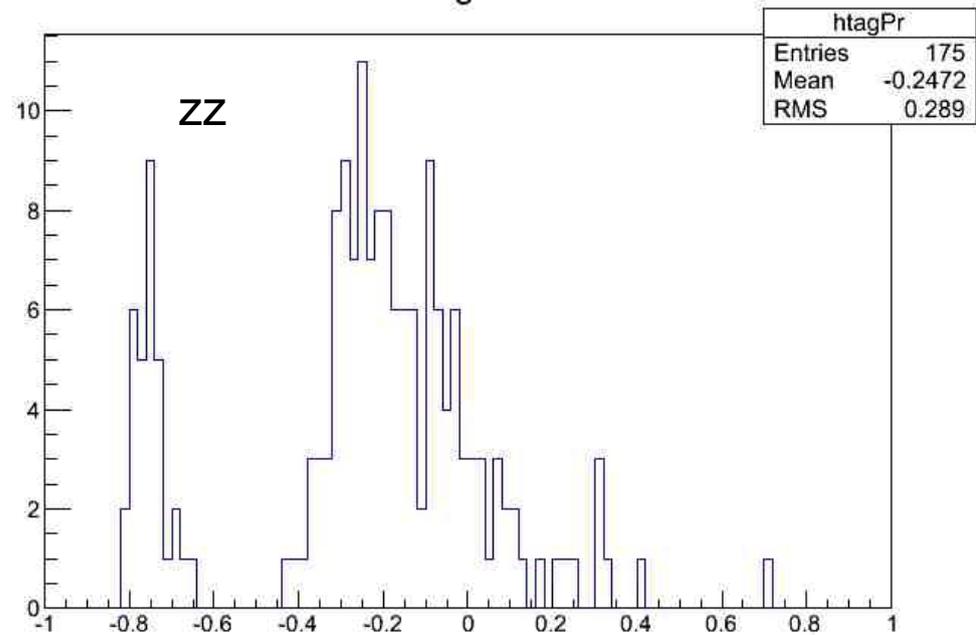
tagPr



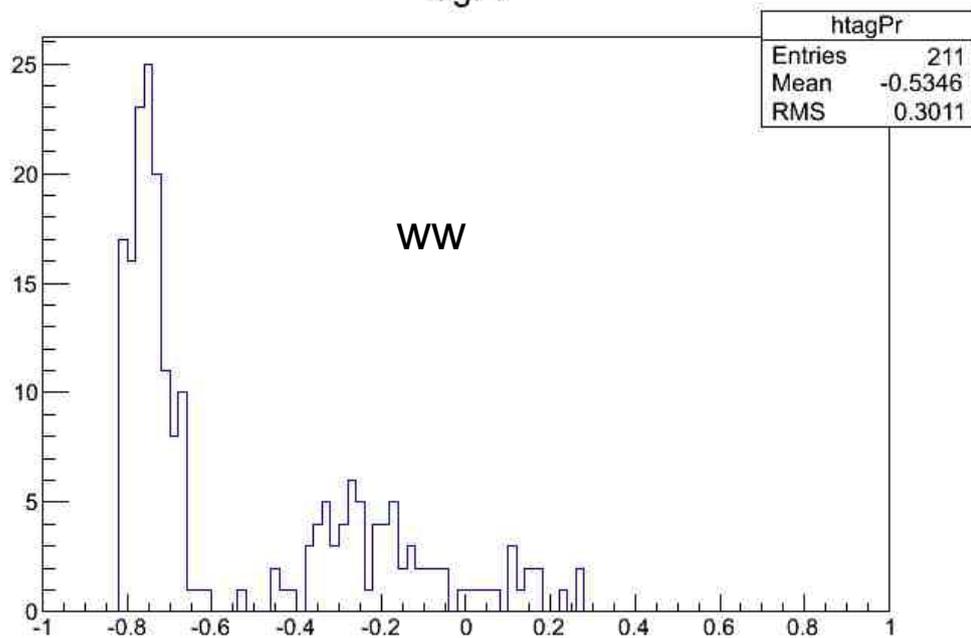
tagPr



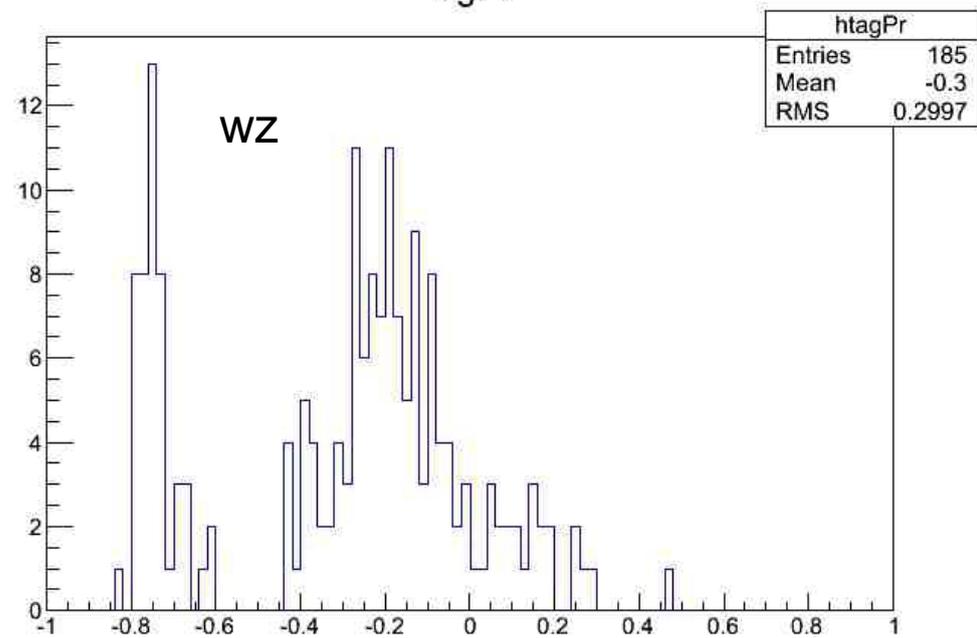
tagPr



tagPr



tagPr



Preselezione contro DY (BDT>0.1)

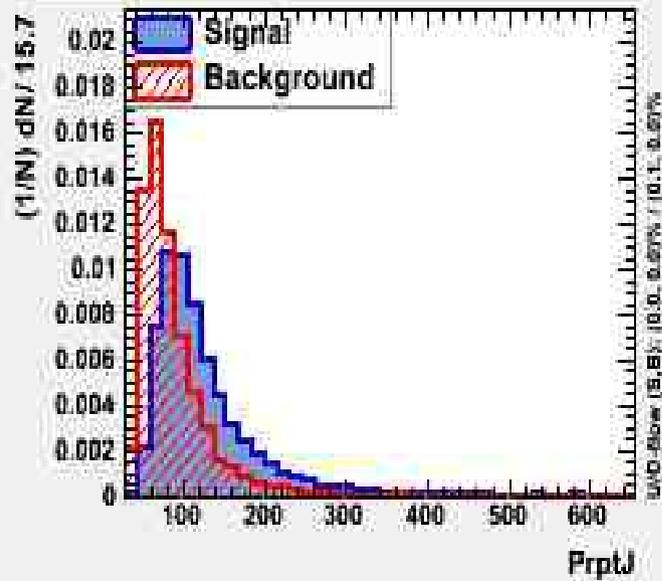
Normalizzati a QCD (eventi analizzati)	Preselezione DY (eventi prima della sel con almeno due leptoni e dopo la sel)
---	---

TtSL	1830	1670/1509
TtFL	1888	1825/544
DY M=10-50	15612	
DY M>50	164181	167859/1281 (due campioni)
QCD	360095	270358/177500
WW	236	211/11
WZ	197	185/15
ZZ	186	175/13
Wjets	11947	4151/1207

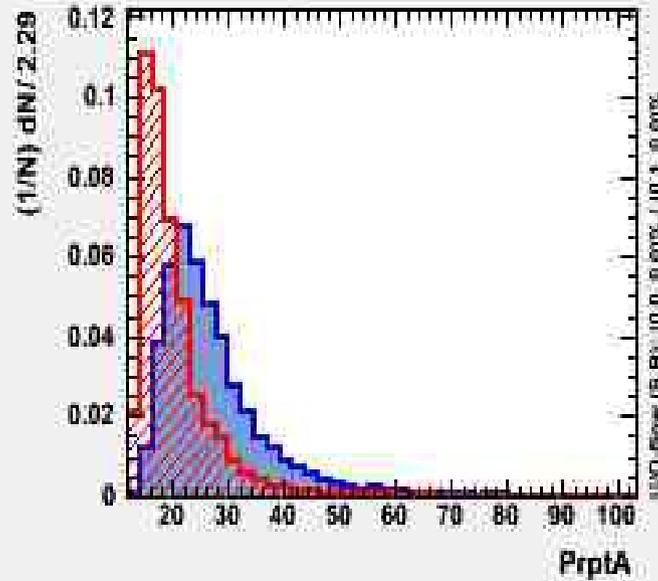
La normalizzazione tiene conto del rapporto tra le luminosita` di MC prodotto per i diversi campioni e dei numeri di eventi nell'ntupla. Prendendo tutto il QCD (prodotto poco) si devono ridurre gli altri campioni.

Preselezione contro QCD

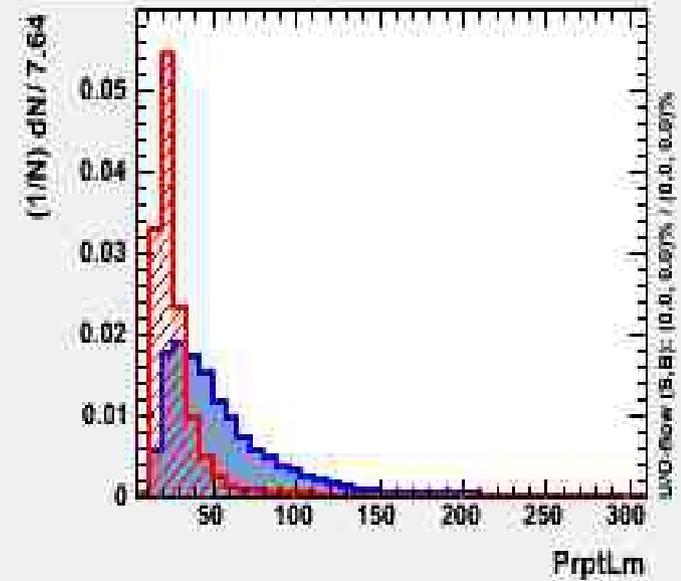
Input variable: PrptJ



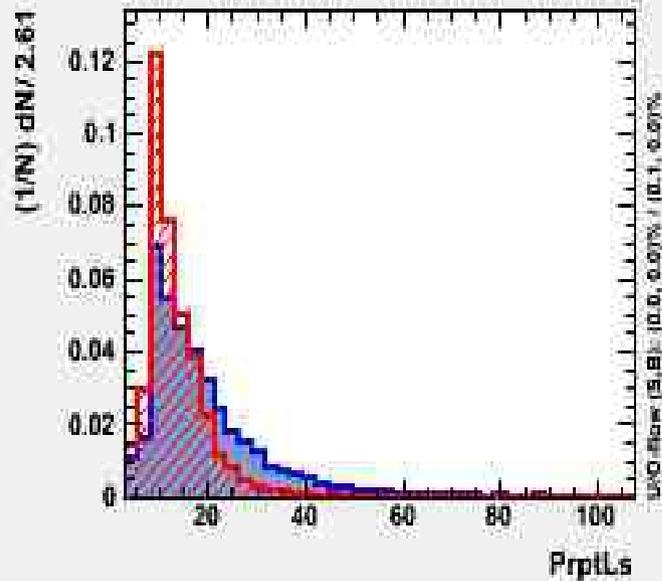
Input variable: PrptA



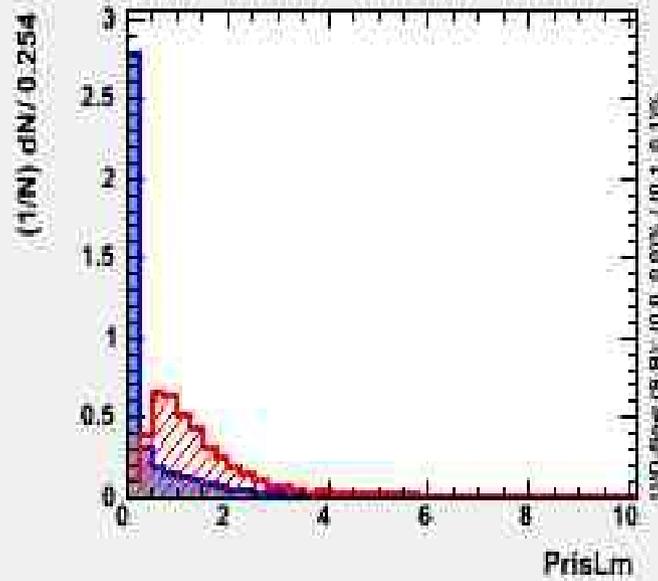
Input variable: PrptLm



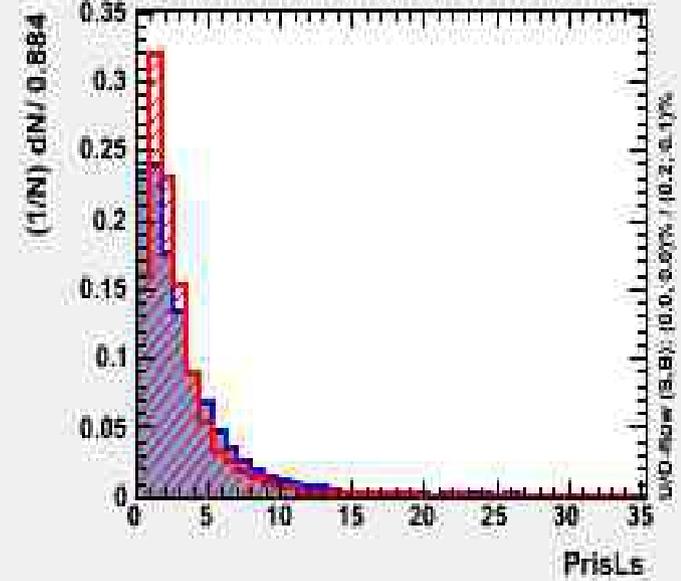
Input variable: PrptLs



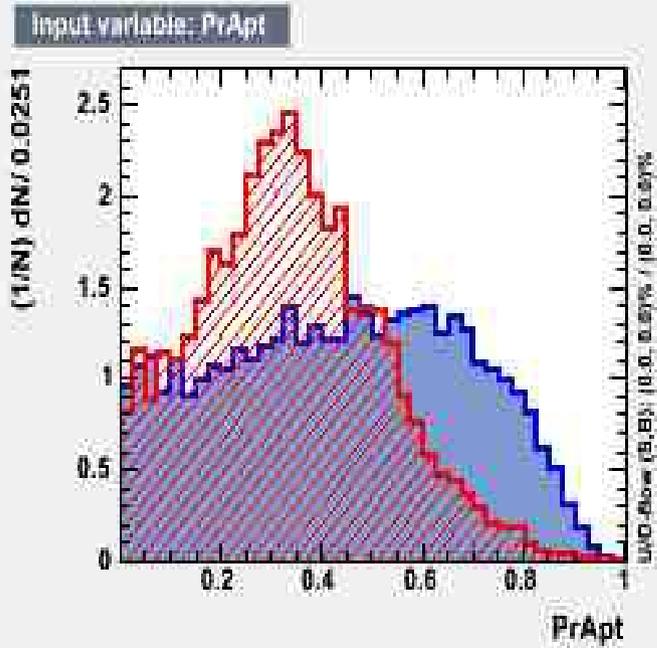
Input variable: PrisLm



Input variable: PrisLs

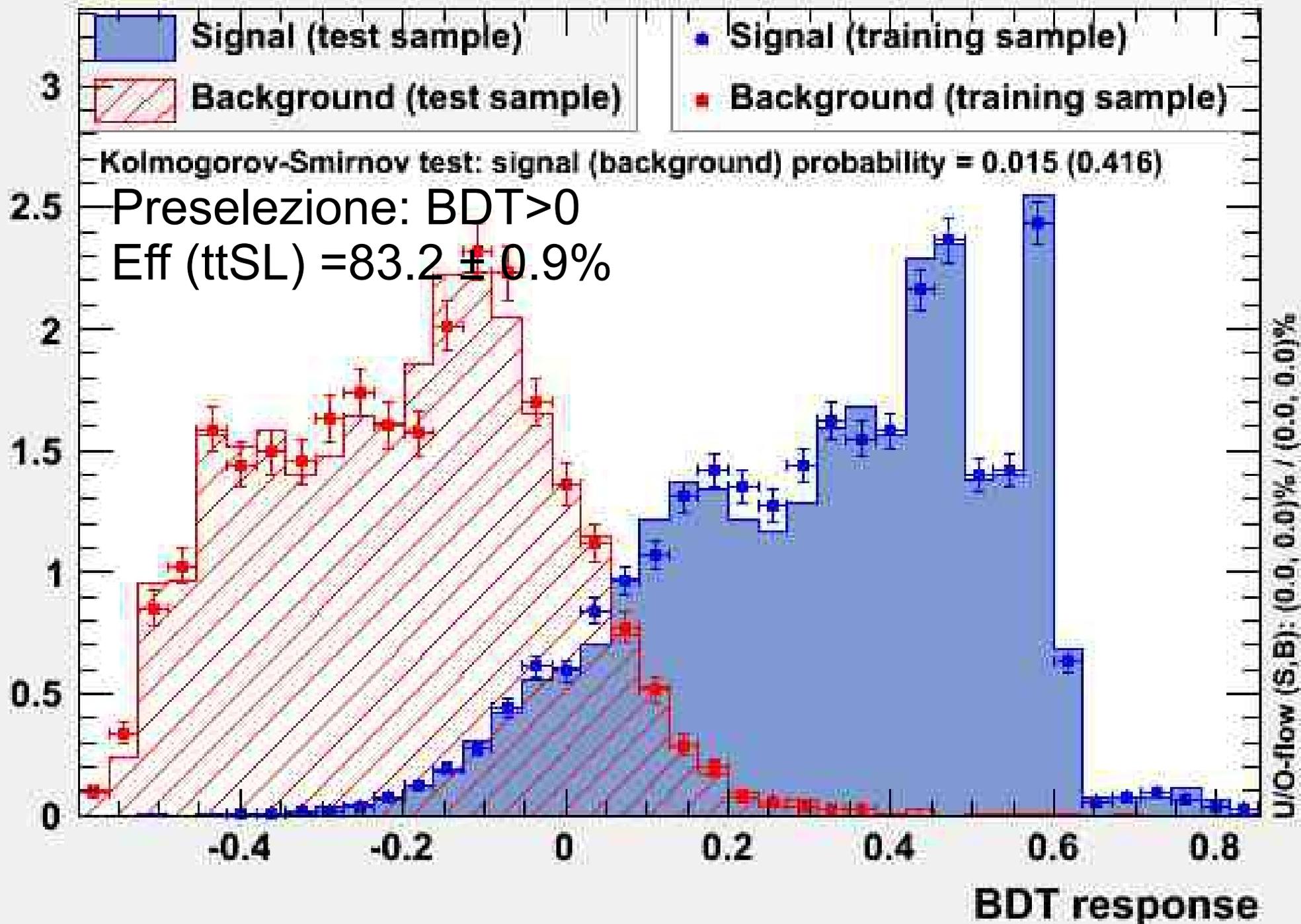


Preselezione contro QCD

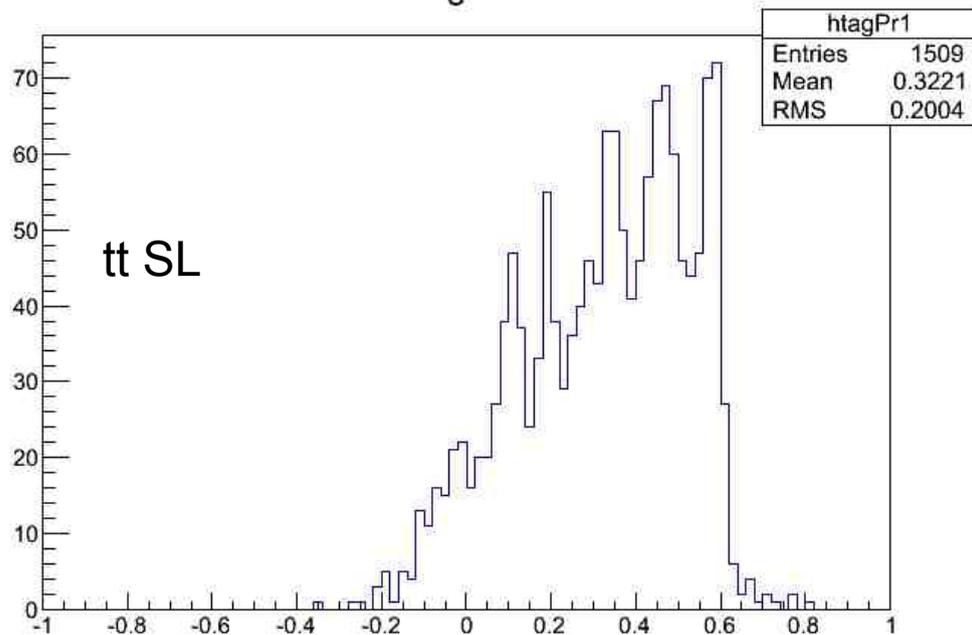


TMVA overtraining check for classifier: BDT

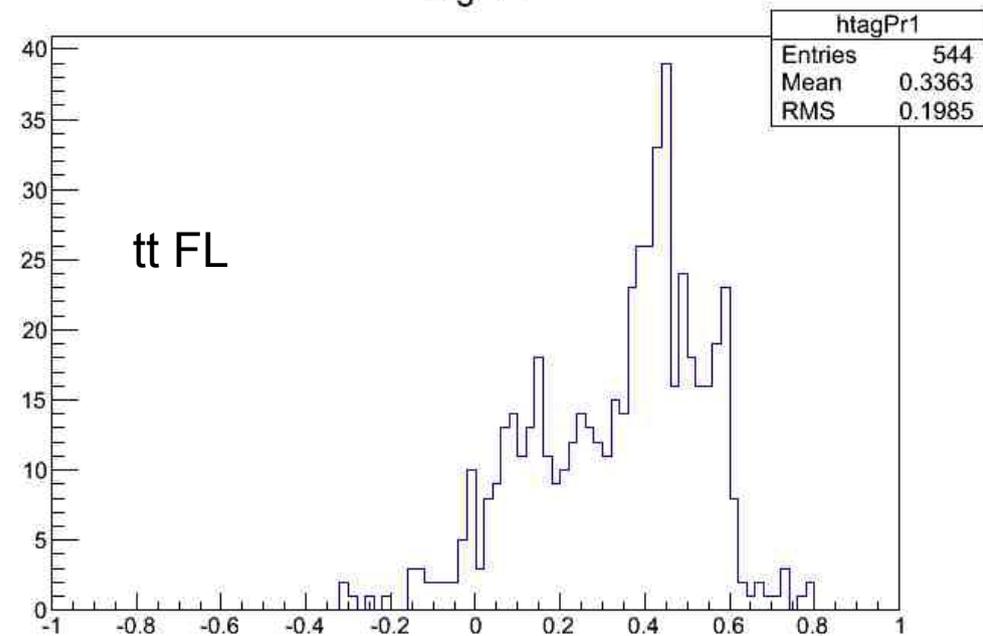
$(1/N) dN/dx$



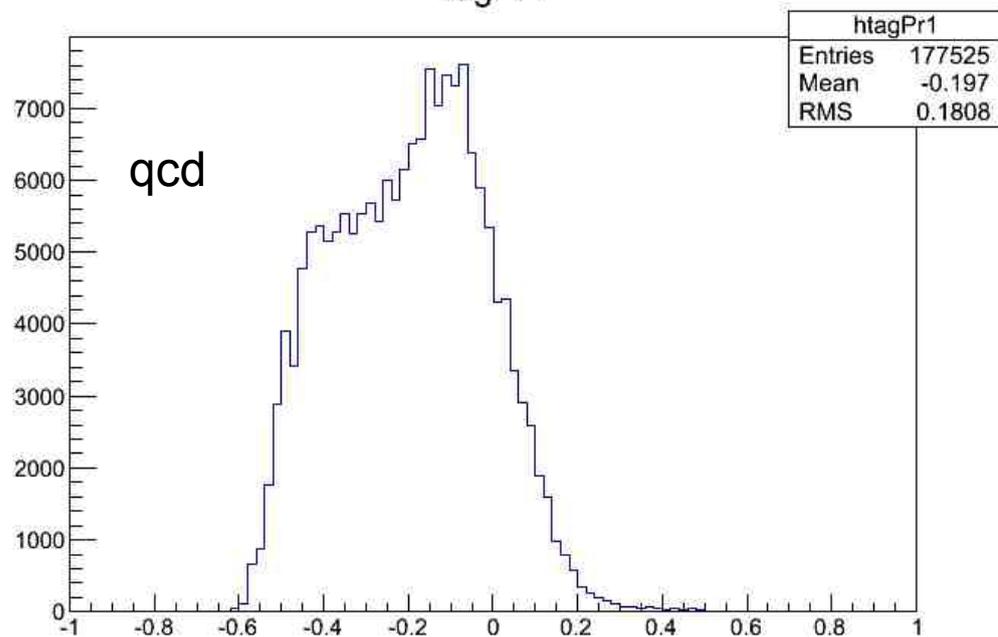
tagPr1



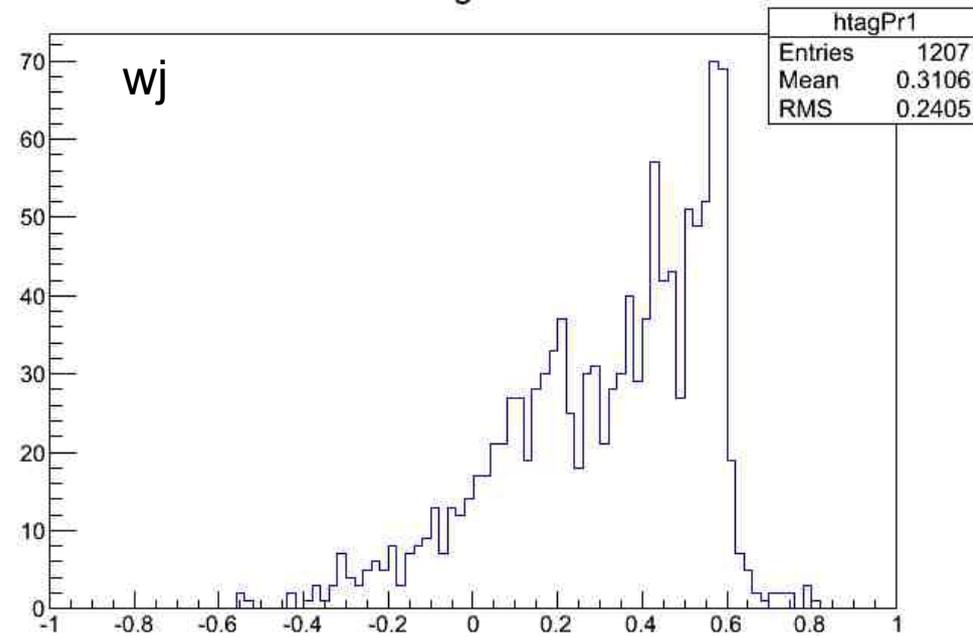
tagPr1



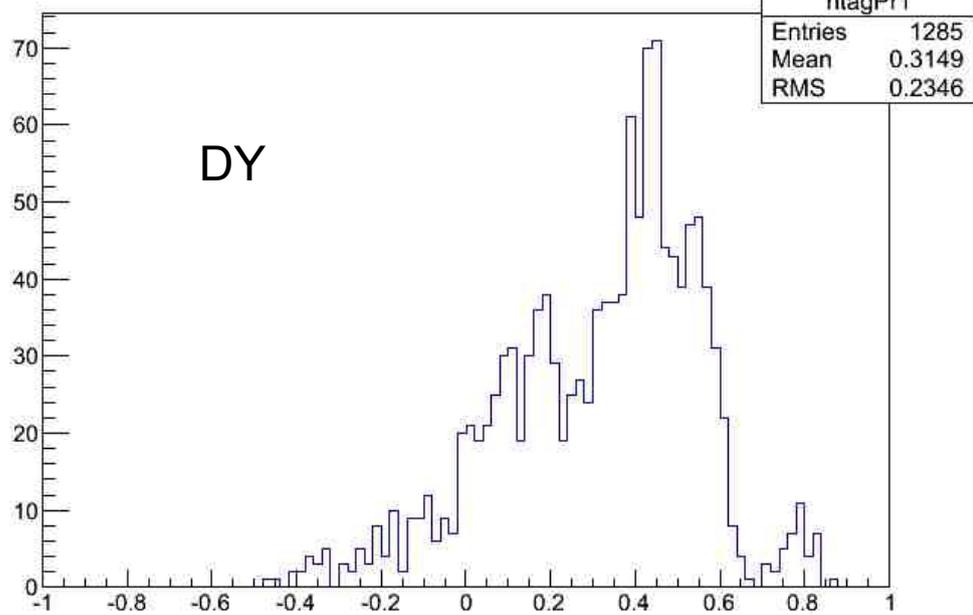
tagPr1



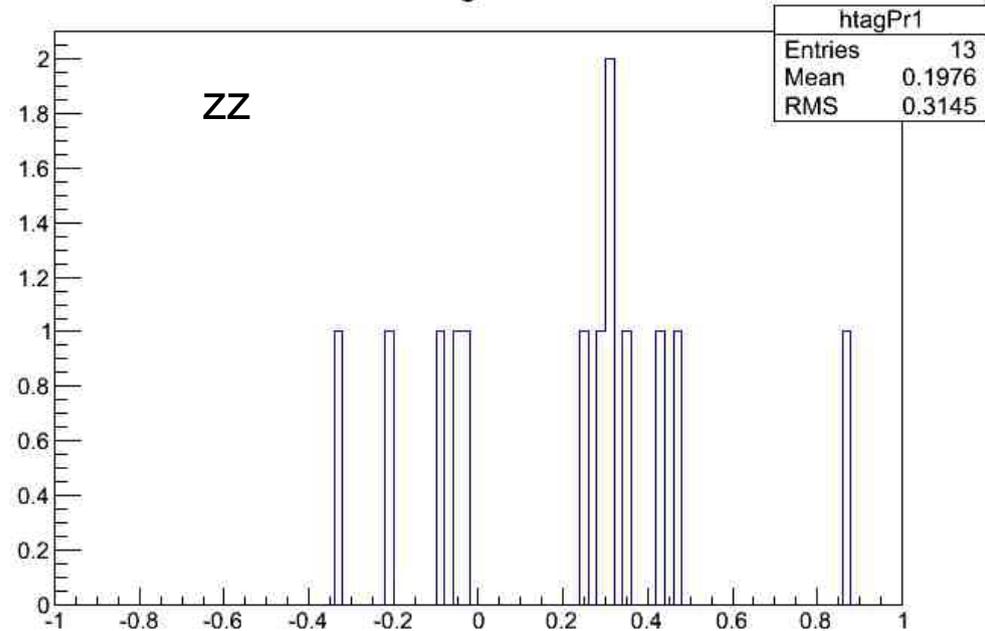
tagPr1



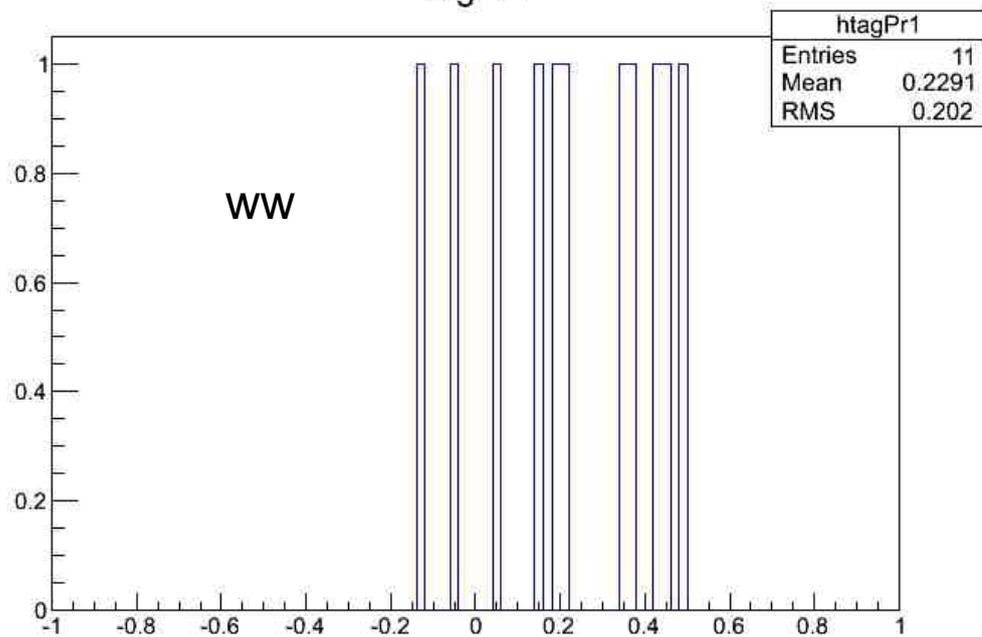
tagPr1



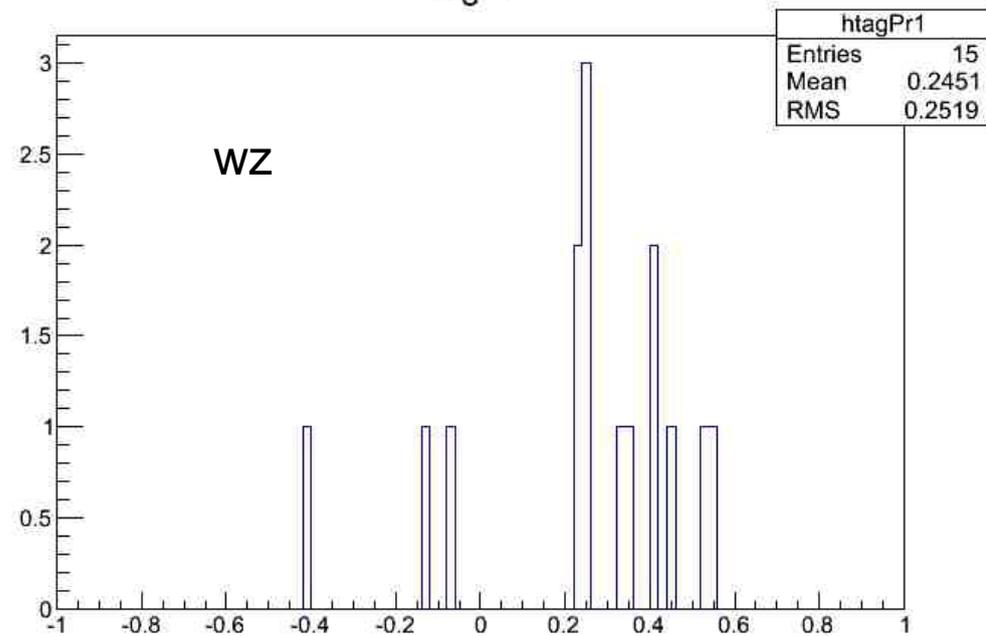
tagPr1



tagPr1



tagPr1



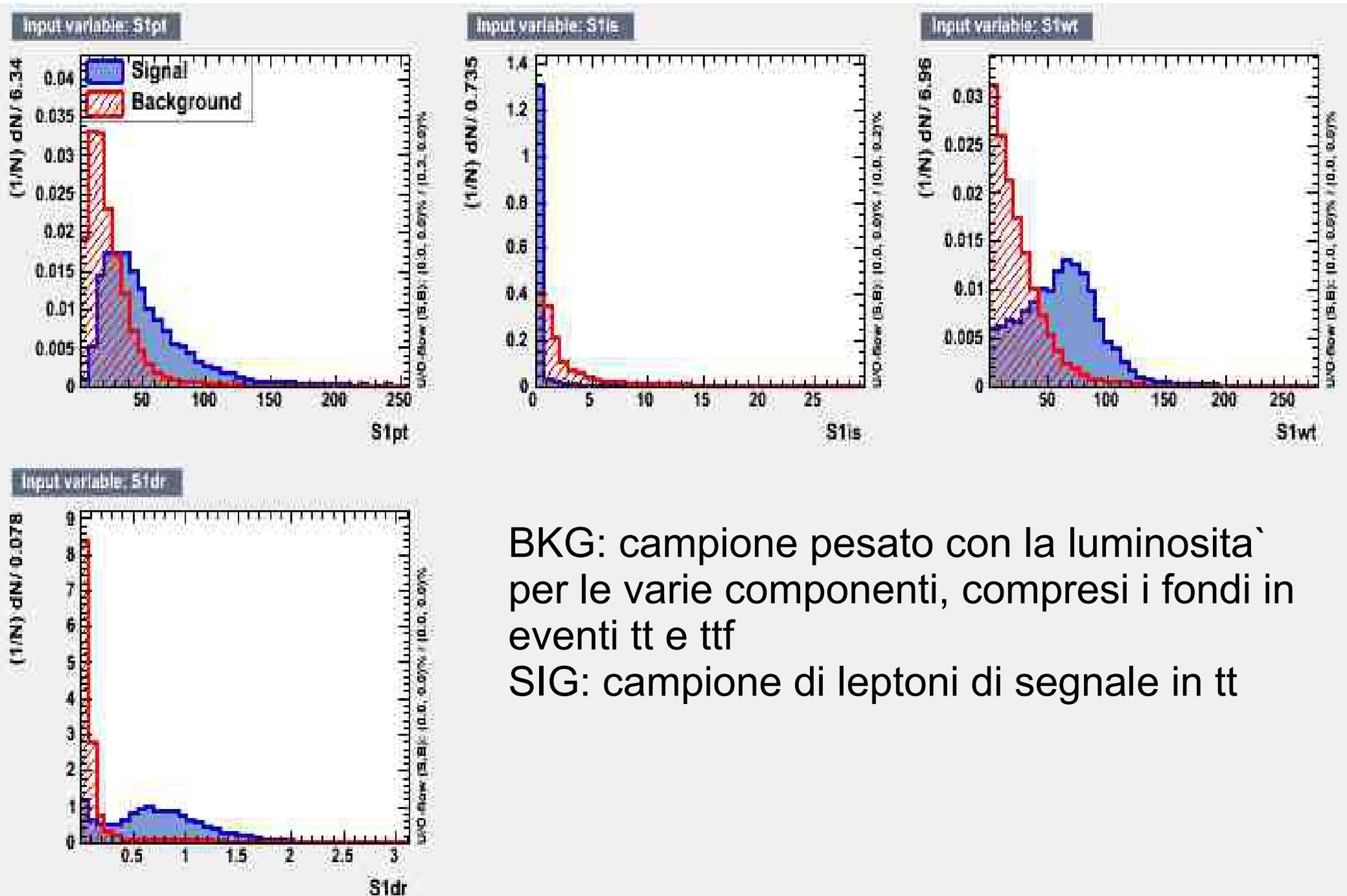
Preselezione contro QCD (BDT>0.)

	Normalizzati a QCD (eventi analizzati)	Preselezione DY/DY+QCD
--	---	------------------------

TtSL	1830	1670/1509/1390
TtFL	1888	1825/544/510
DY M=10-50	15612	
DY M>50	164181	167859/1285/1158 (due campioni)
QCD	360095	270358/177525/24990
WW	236	211/11/9
WZ	197	185/15/12
ZZ	186	175/13/9
Wjets	11947	4151/1207/1070

La normalizzazione tiene conto del rapporto tra le luminosita` di MC prodotto per i diversi campioni e dei numeri di eventi nell'ntupla. Prendendo tutto il QCD (prodotto poco) si devono ridurre gli altri campioni.

Selezione muone da top in tt

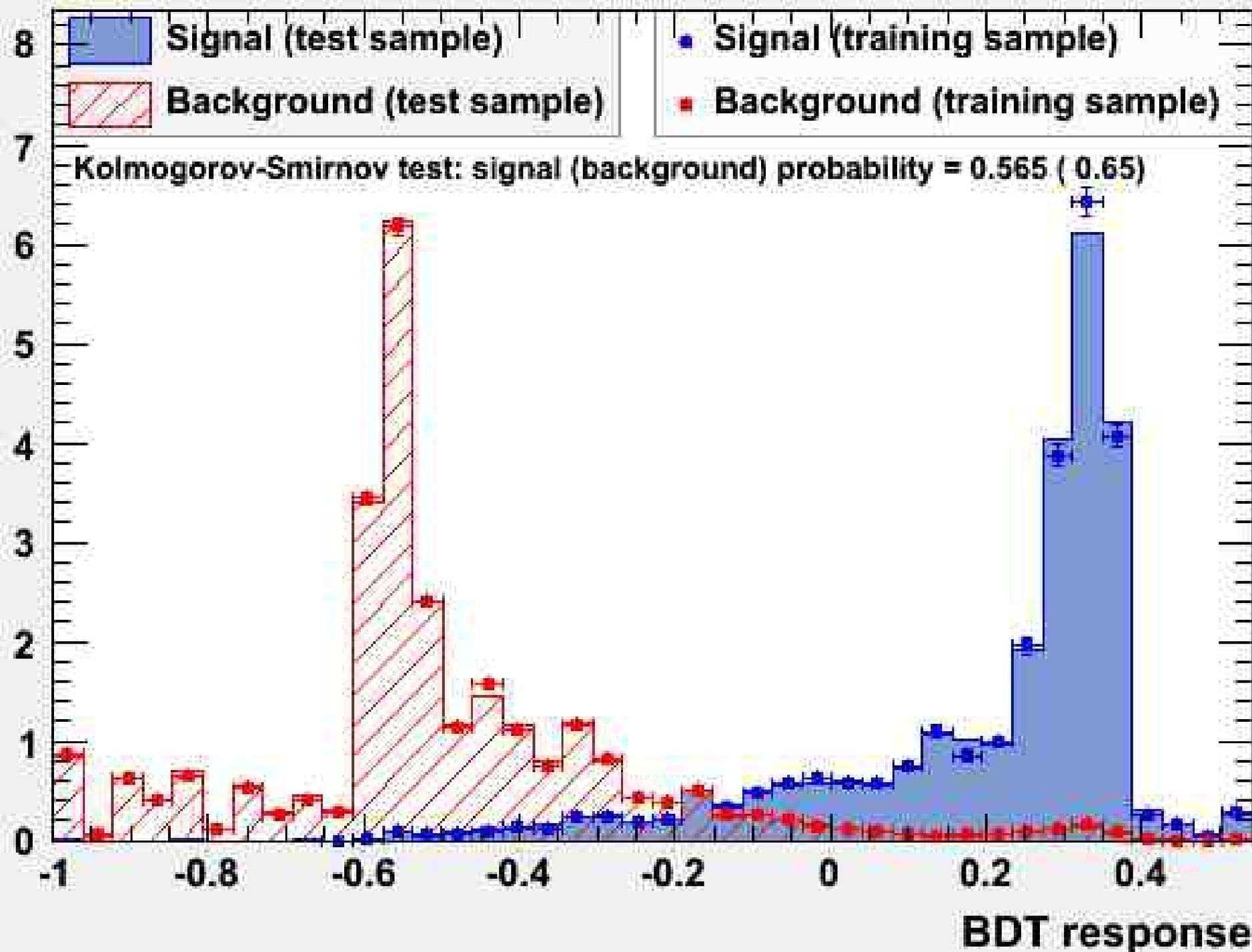


BKG: campione pesato con la luminosita`
per le varie componenti, compresi i fondi in
eventi tt e ttf

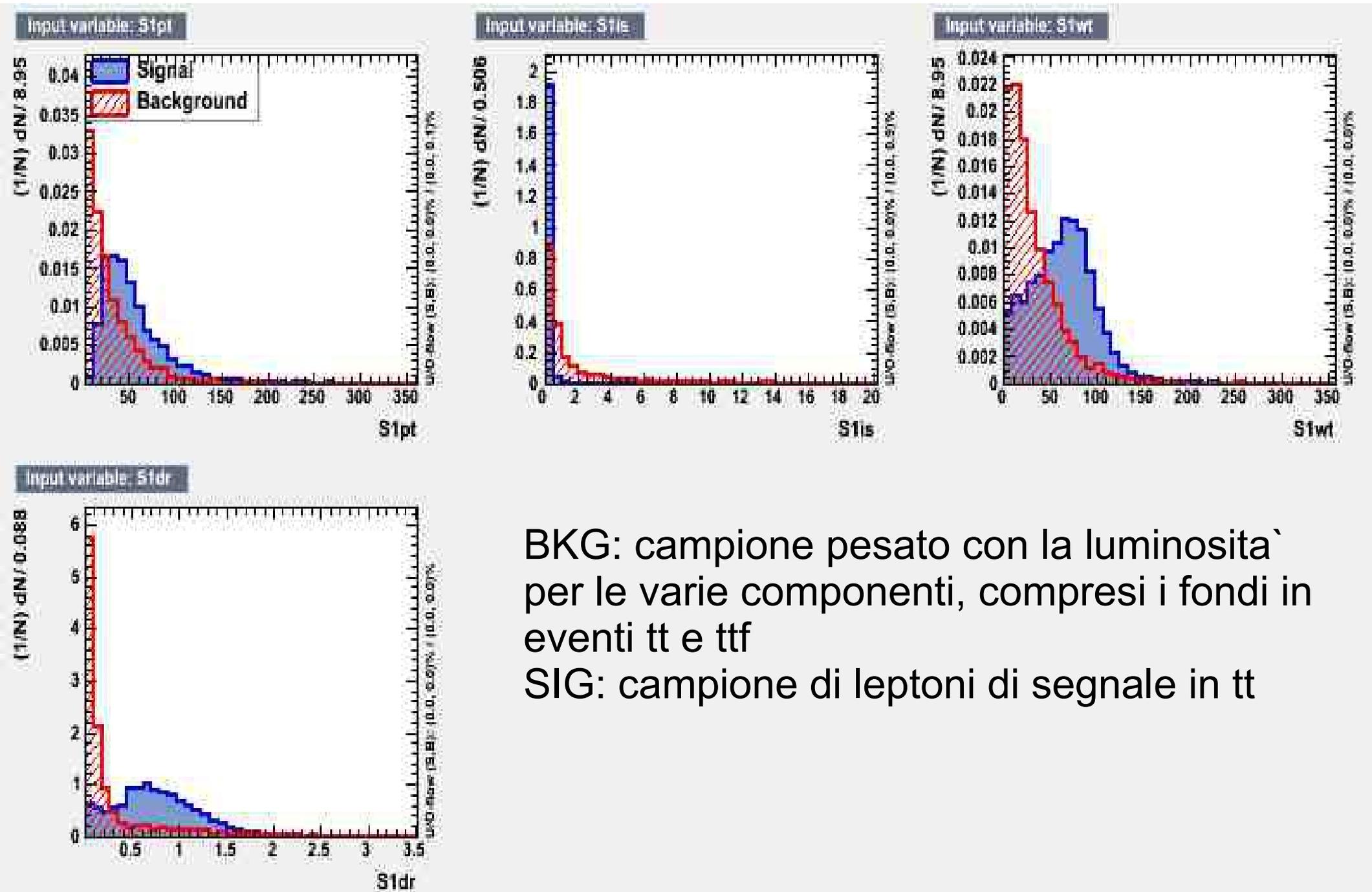
SIG: campione di leptoni di segnale in tt

TMVA overtraining check for classifier: BDT

$x_p / N_p \cdot dN / dx$



Selezione elettrone da top in tt

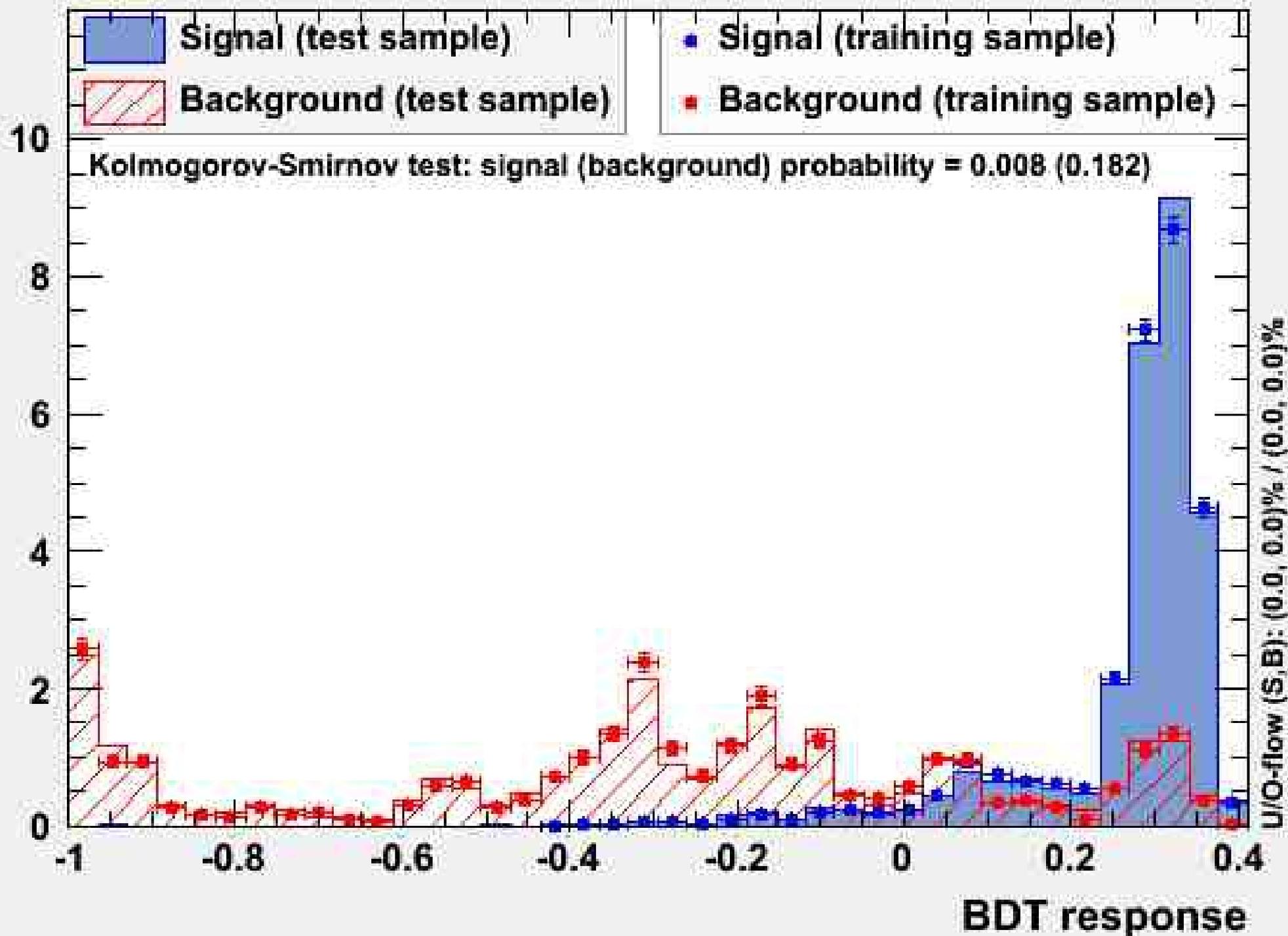


BKG: campione pesato con la luminosita`
per le varie componenti, compresi i fondi in
eventi tt e ttf

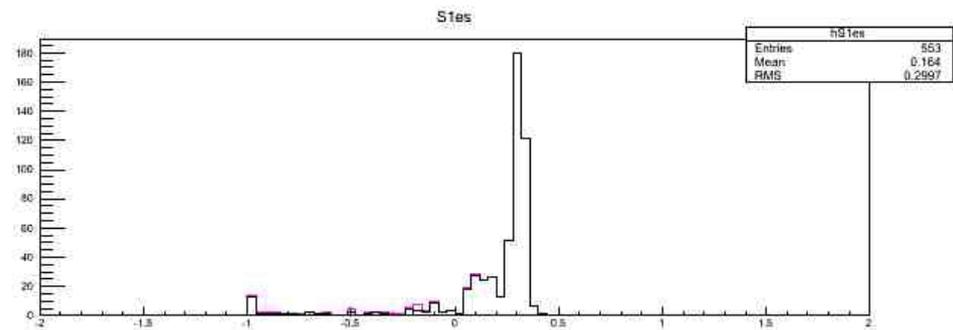
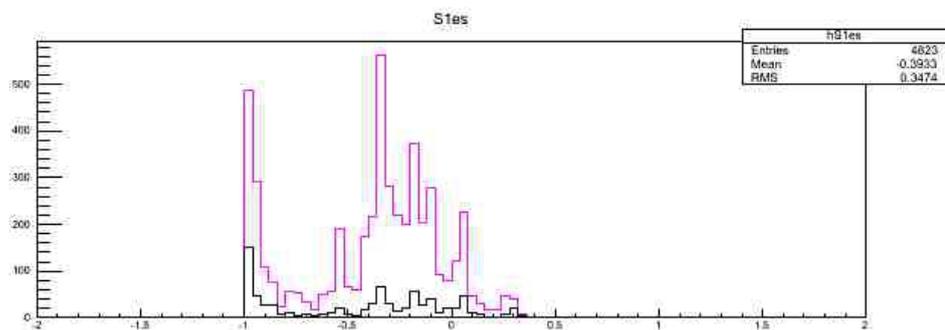
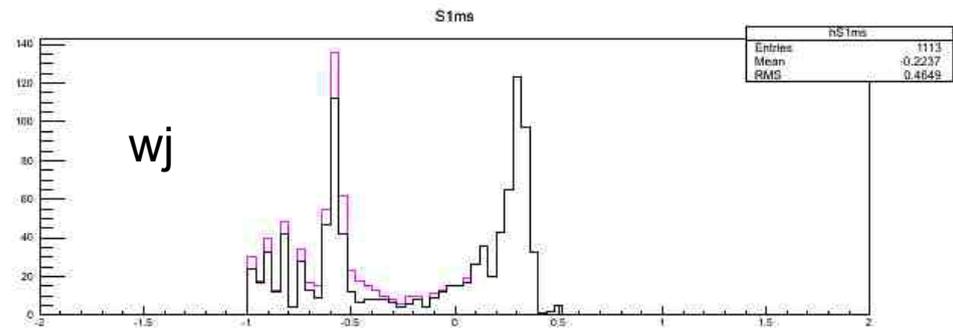
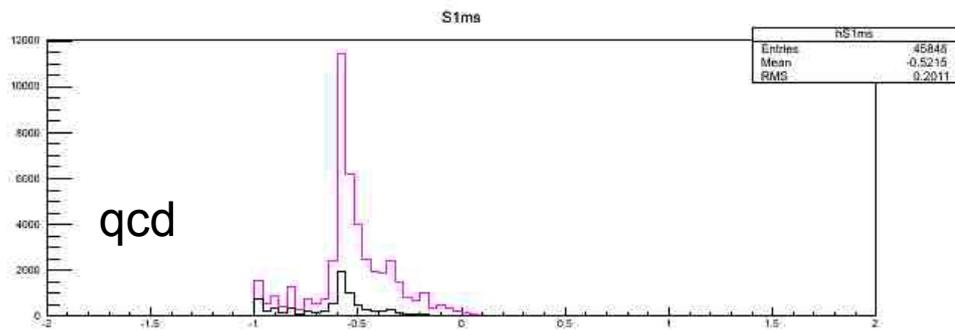
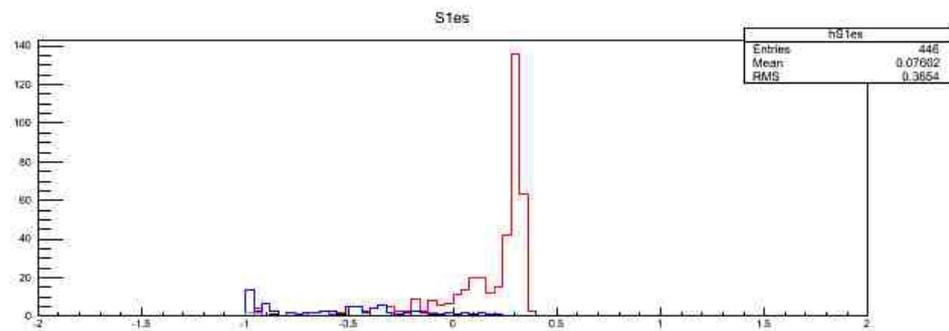
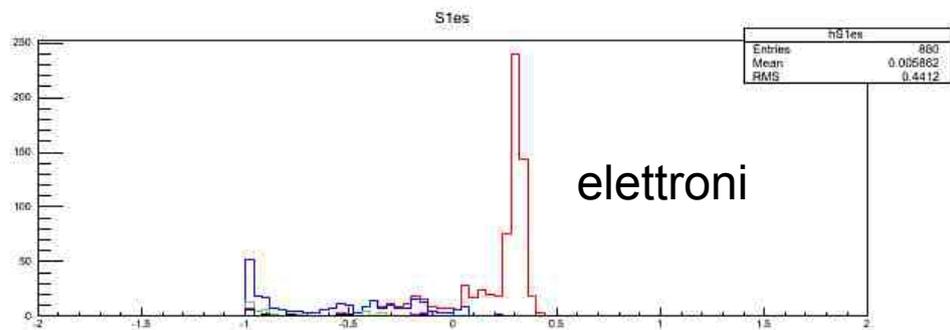
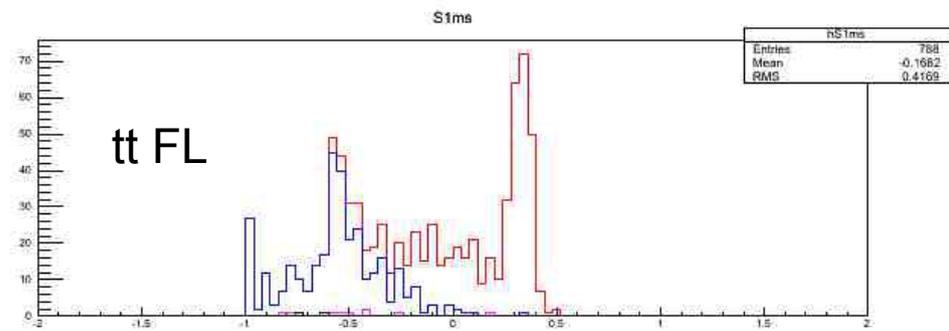
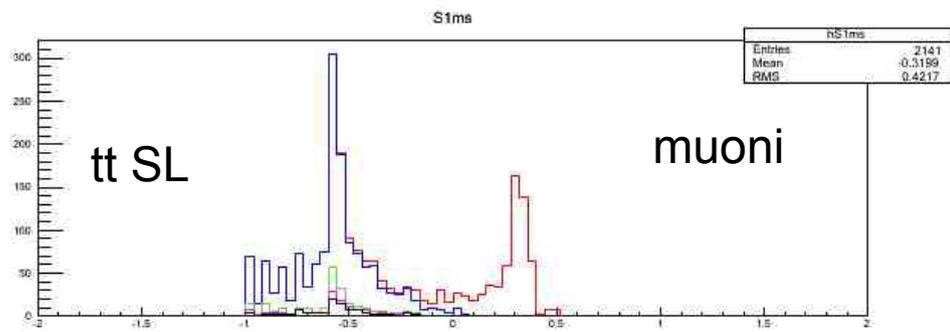
SIG: campione di leptoni di segnale in tt

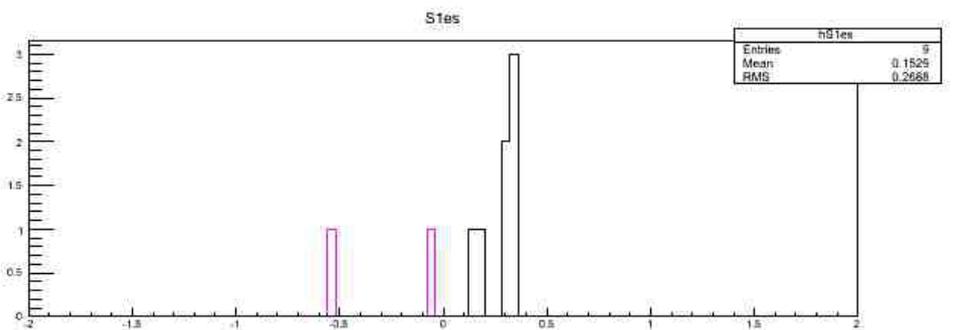
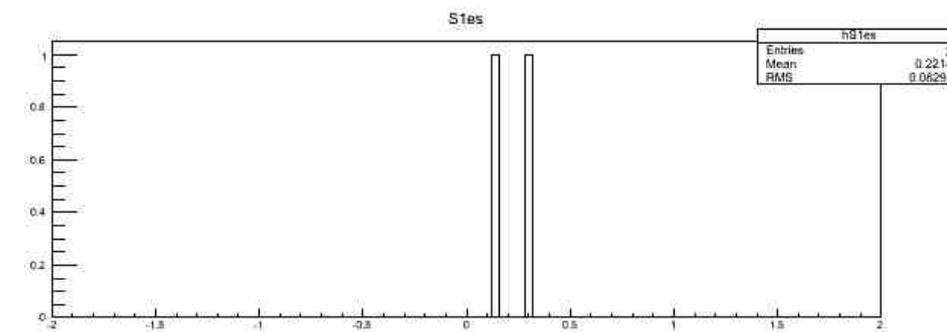
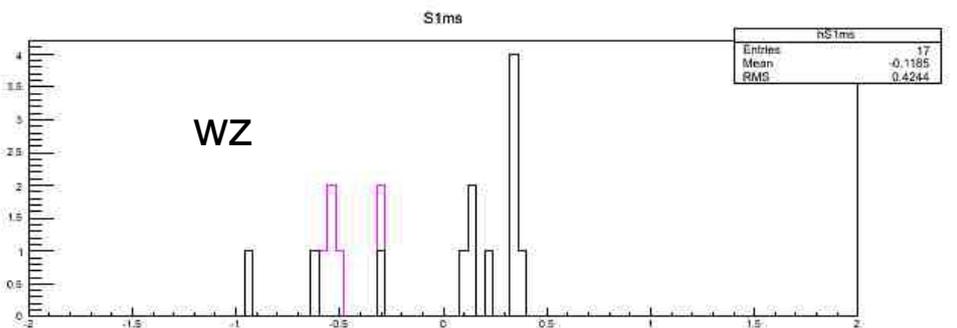
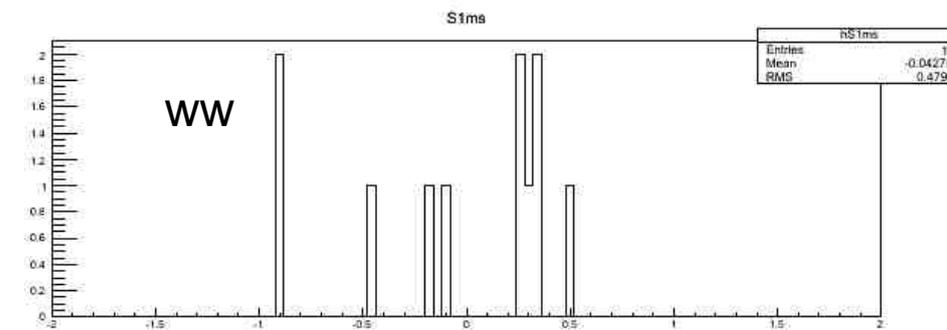
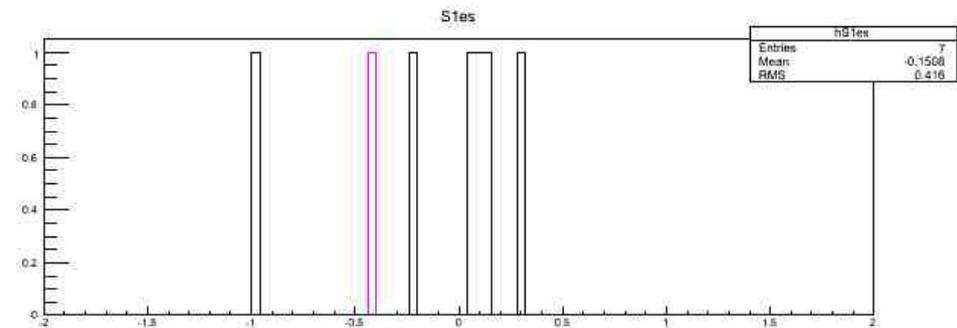
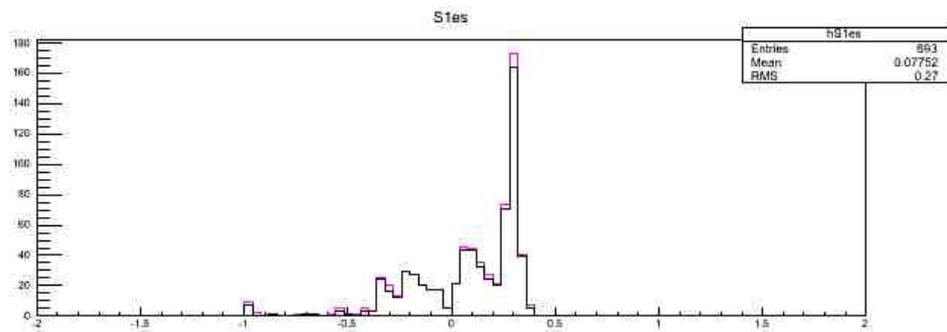
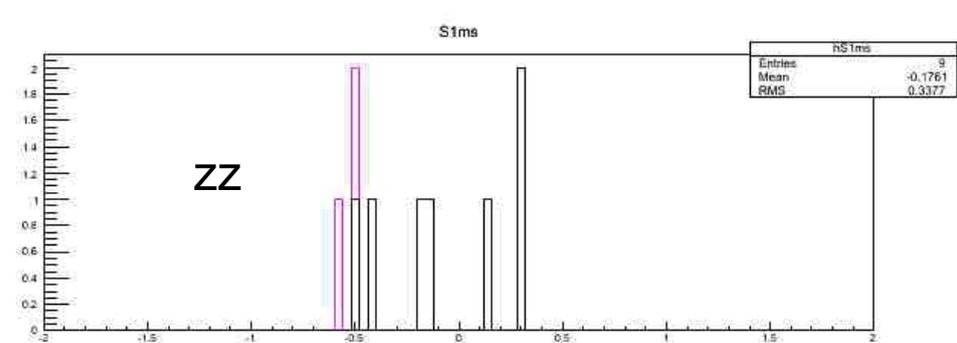
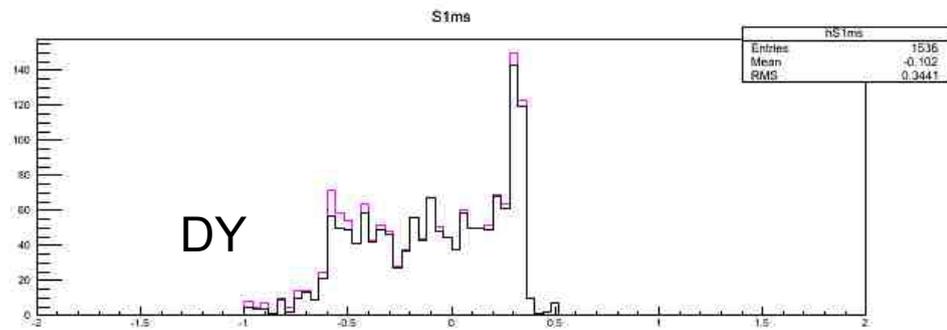
TMVA overtraining check for classifier: BDT

$(1/N) dN/dx$

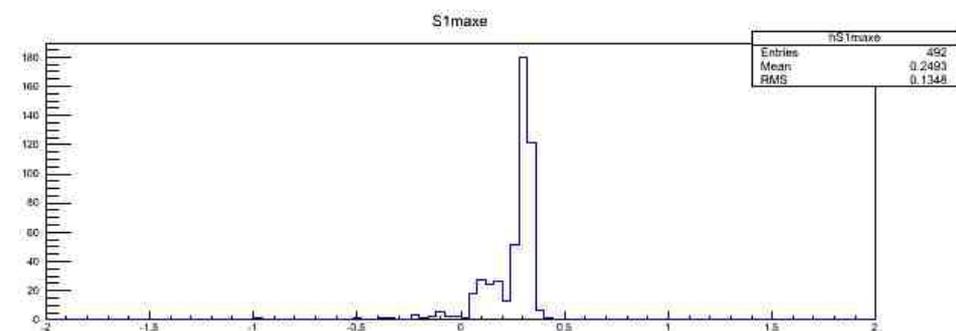
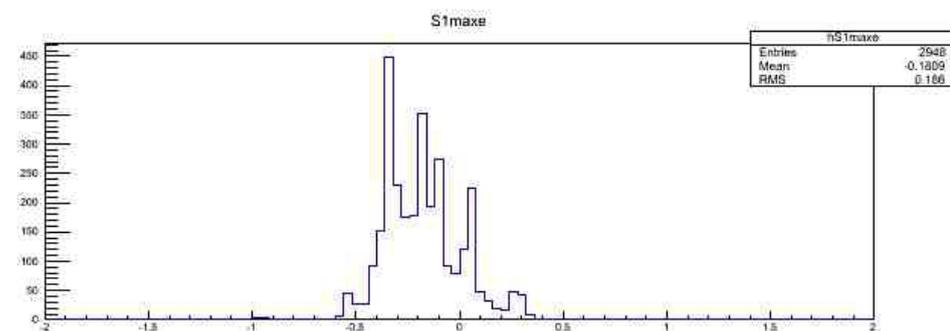
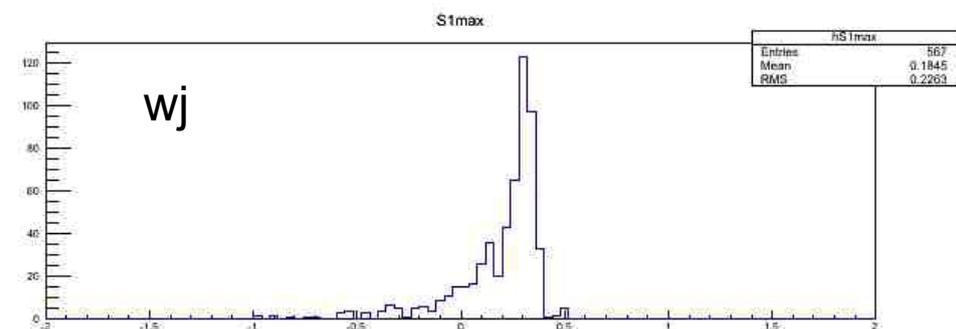
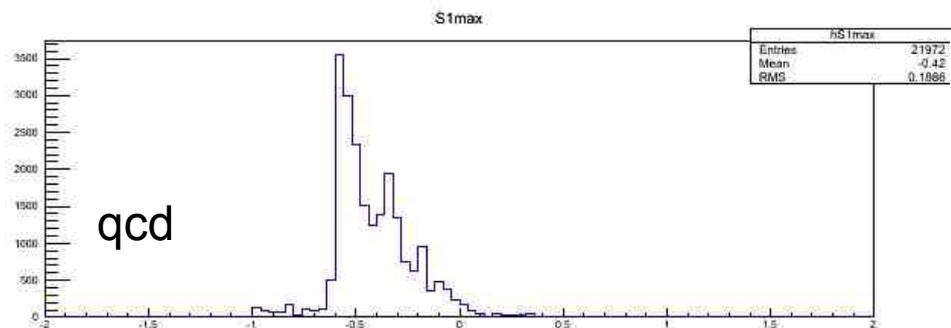
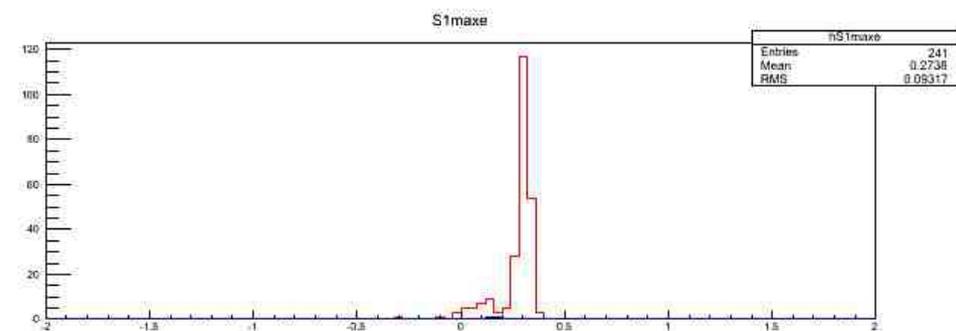
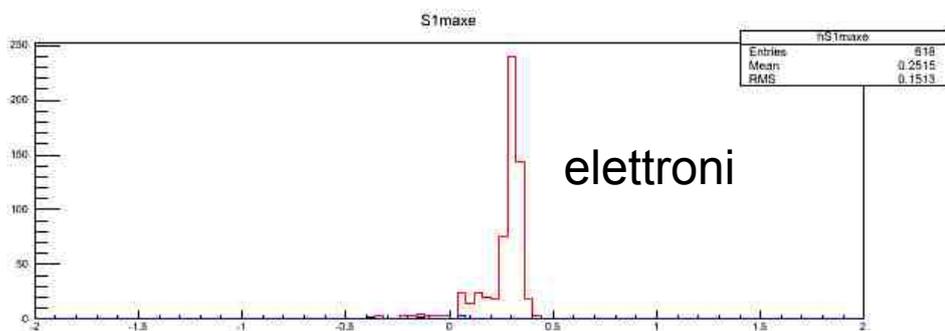
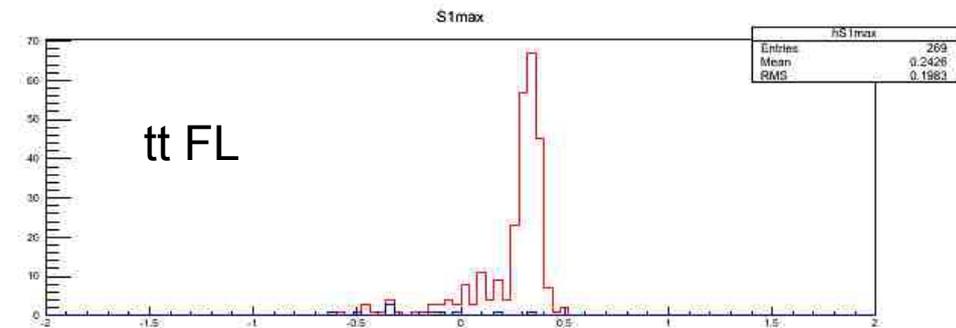
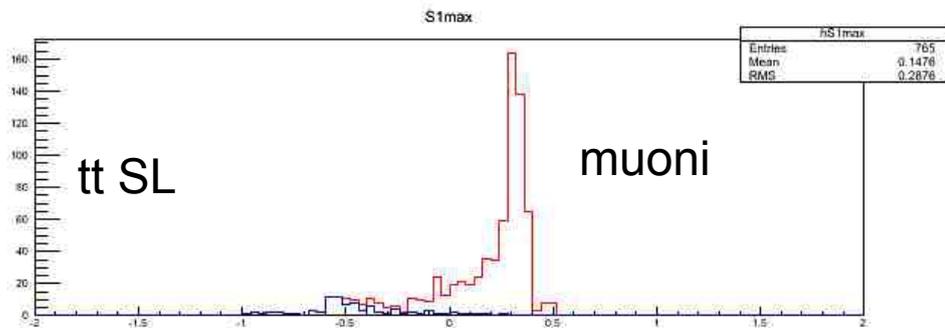


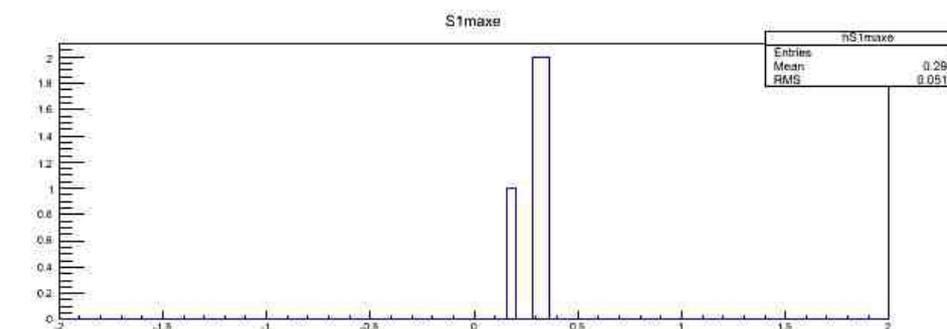
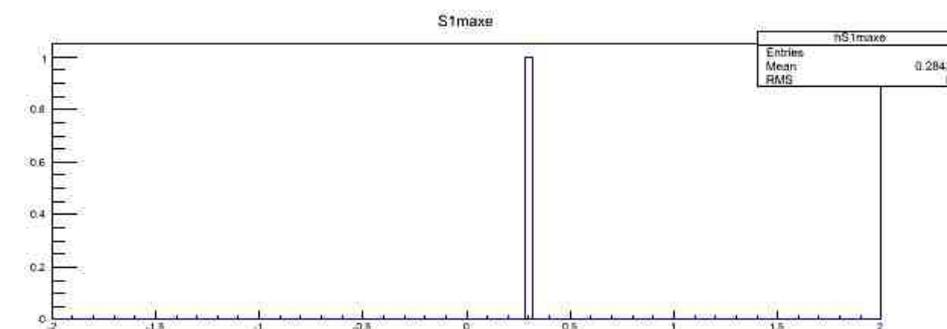
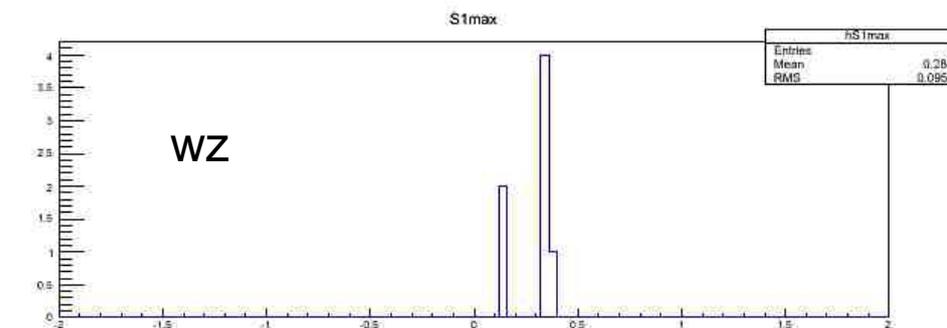
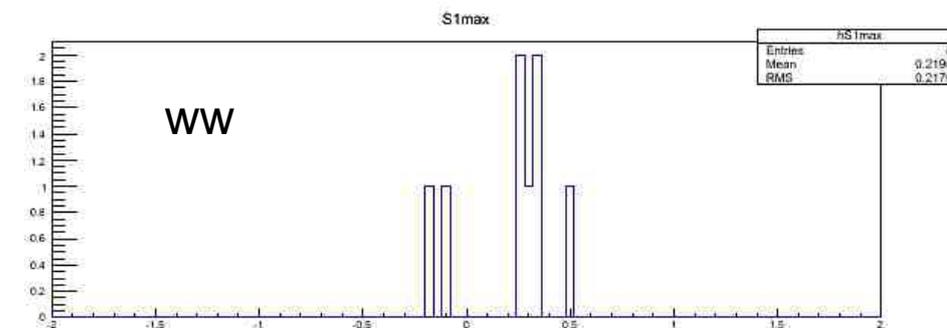
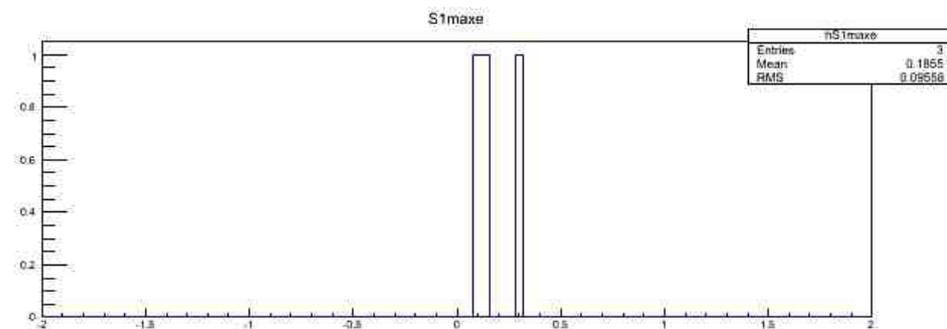
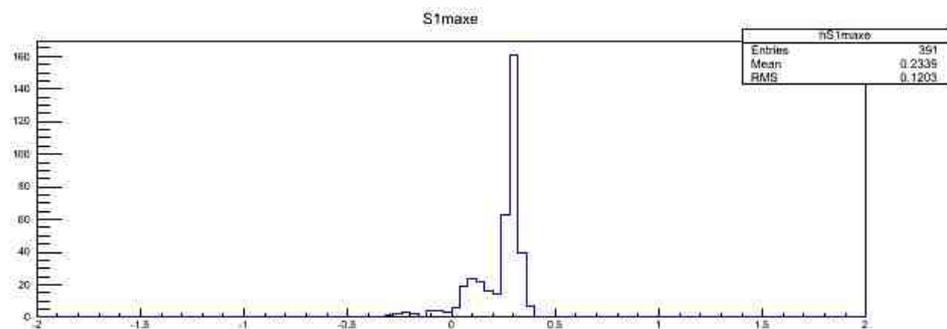
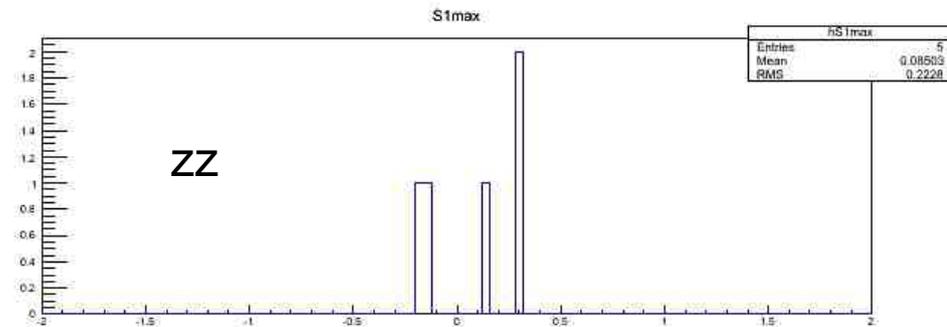
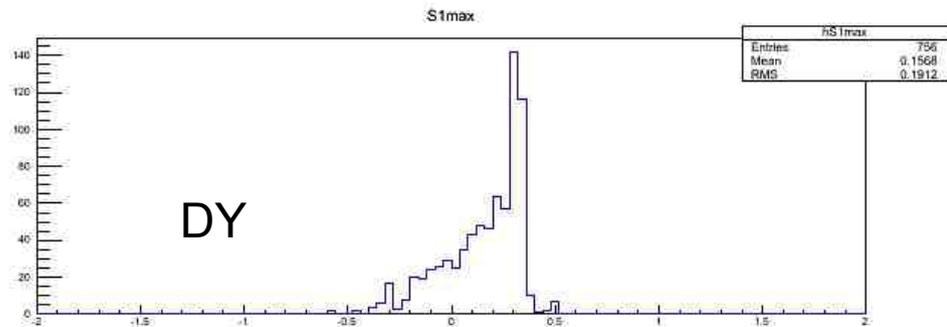
Tutti i leptoni dell'evento





Leptone a massimo BDT
dell'evento





Selezione S1 da top (BDT>0.1 max nell'evento) **mu+ele (BKG)**

Normalizzati a QCD
(eventi analizzati)

Preselezione DY/DY+QCD/S1

TtSL	1830	1670/1509/1390/555+555 (3+3)
TtFL	1888	1825/544/510/230+218 (2+1)
DY M=10-50	15612	
DY M>50	164181	167859/1285/1158/536+323
QCD	360095	270358/177525/24990/247+212
WW	236	211/11/9/6+1
WZ	197	185/15/12/7+5
ZZ	186	175/13/9/3+1
Wjets	11947	4151/1207/1070/451+451

tt+ttf = 41% (0.2% fondi da tt)

DY=23%

QCD=12%

WW+WZ+ZZ=0.6%

Wjets=23%

Ricostruzione Evento

1)
Massimo 10 Jets
Taglio Pt Jet > 10 GeV
 $\epsilon(\text{tengo i 4 jets}) = 90.2 \pm 0.6\%$
 $\epsilon(\text{tengo i 2 b jets}) = 97.7 \pm 0.3\%$
ROC = 0.992

Problemi lettura TMVA
(troppe combinazioni di BKG)

Massimo 2000 evts

3)
Massimo 6 Jets
Taglio Pt Jet > 10 GeV
 $\epsilon(\text{tengo i 4 jets}) = 74.6 \pm 0.7\%$
 $\epsilon(\text{tengo i 2 b jets}) = 92.3 \pm 0.4\%$
ROC = 0.978

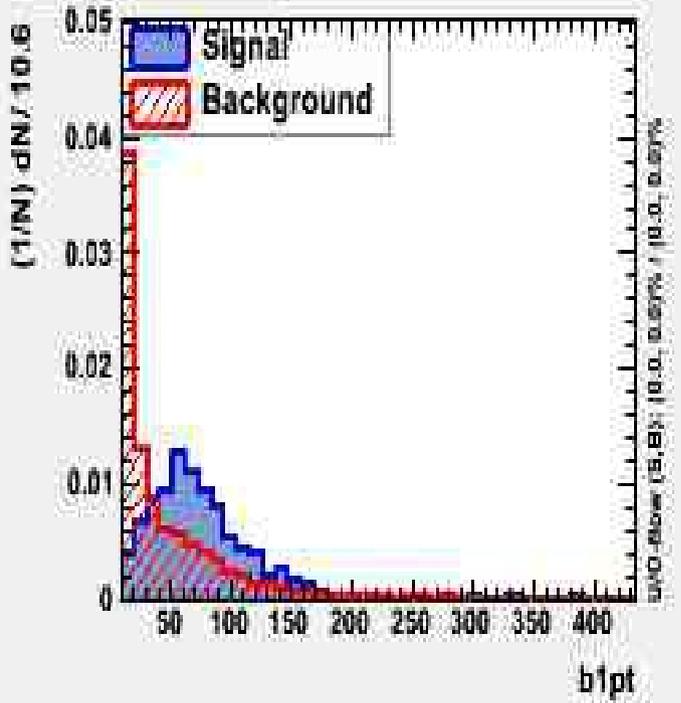
2)
Massimo 10 Jets
Taglio Pt Jet > 20 GeV
 $\epsilon(\text{tengo i 4 jets}) = 65.5 \pm 0.7\%$
 $\epsilon(\text{tengo i 2 b jets}) = 90.1 \pm 0.5\%$
ROC = 0.983

4)
Massimo 10 Jets
Taglio Pt Jet > 15 GeV
 $\epsilon(\text{tengo i 4 jets}) = 79.8 \pm 0.6\%$
 $\epsilon(\text{tengo i 2 b jets}) = 94.8 \pm 0.3\%$
ROC = 0.988

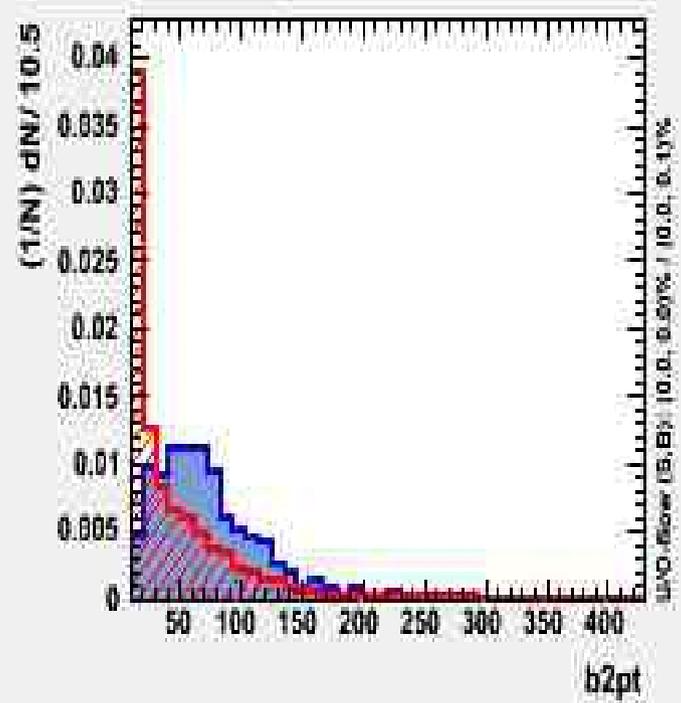
Problemi lettura TMVA

Massimo 10 Jets
Taglio Pt Jet > 10 GeV

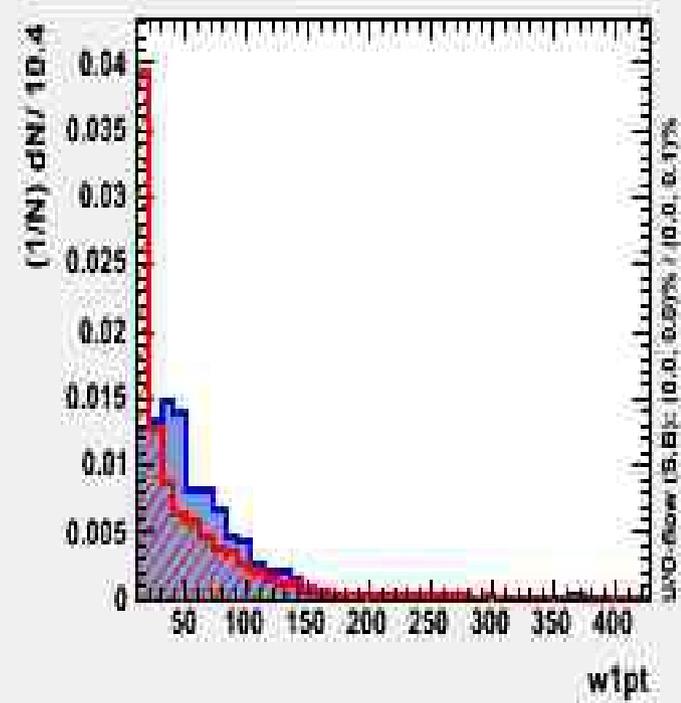
Input variable: b1pt



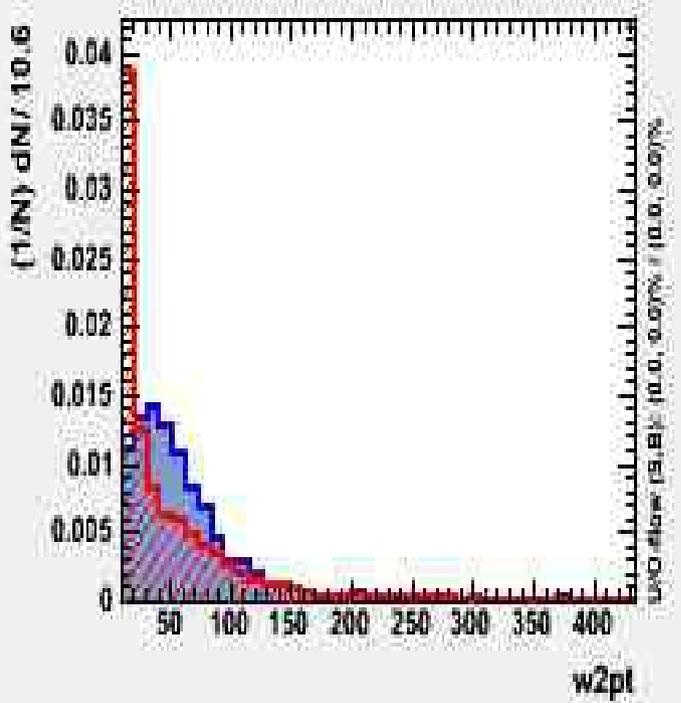
Input variable: b2pt



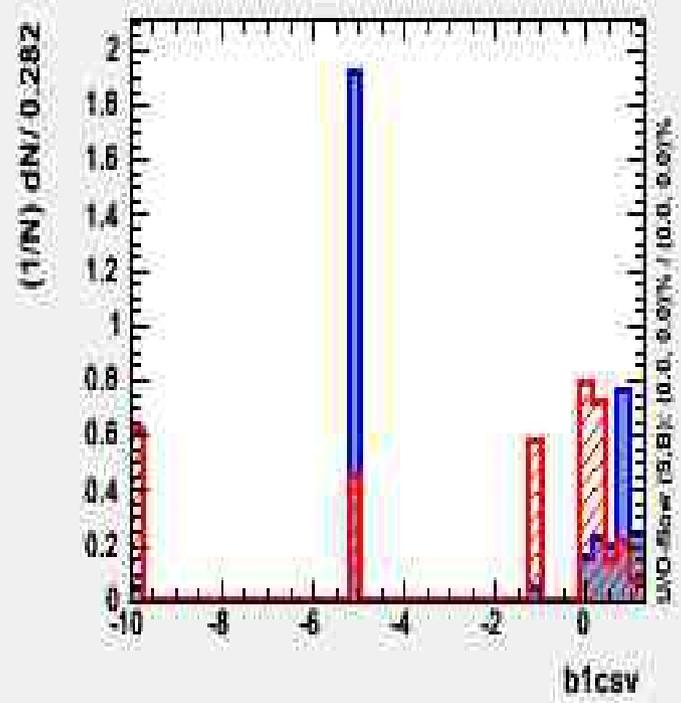
Input variable: w1pt



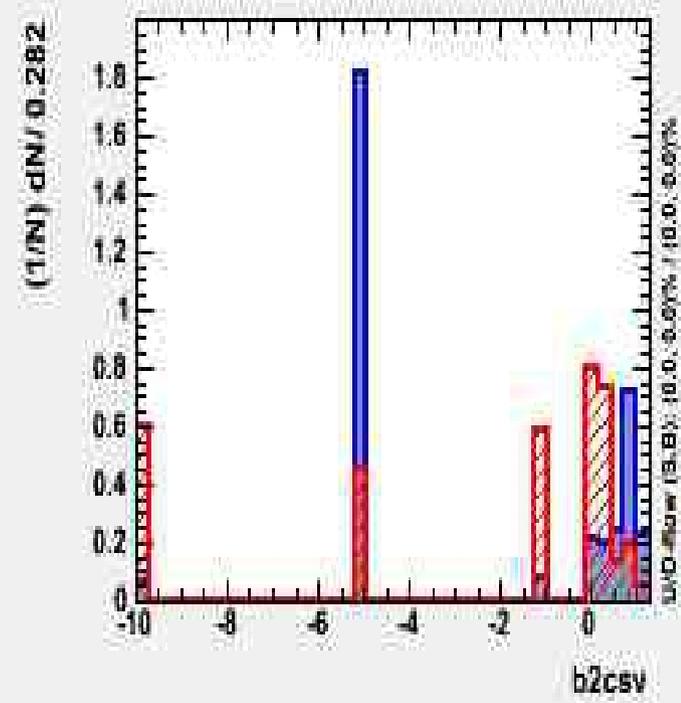
Input variable: w2pt



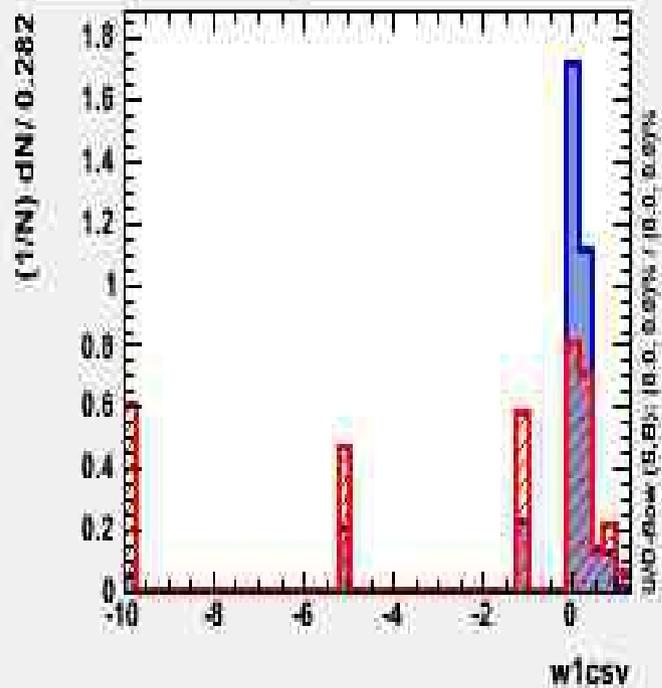
Input variable: b1csv



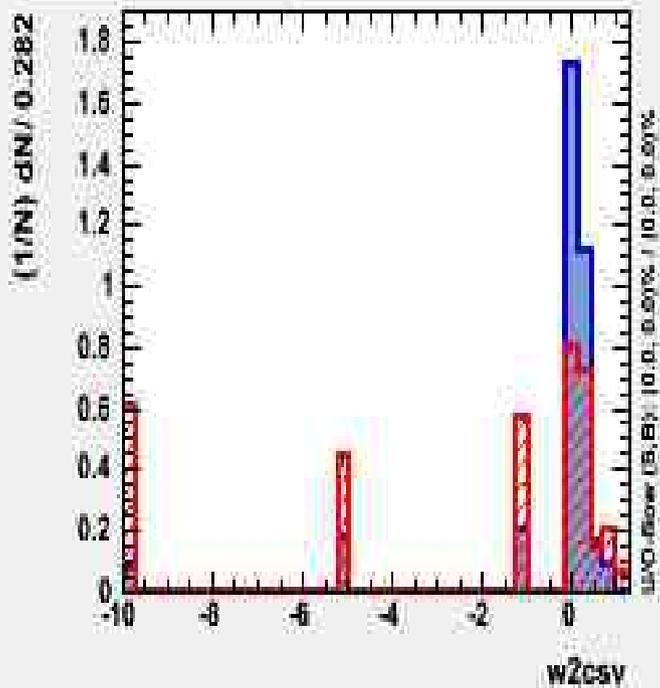
Input variable: b2csv



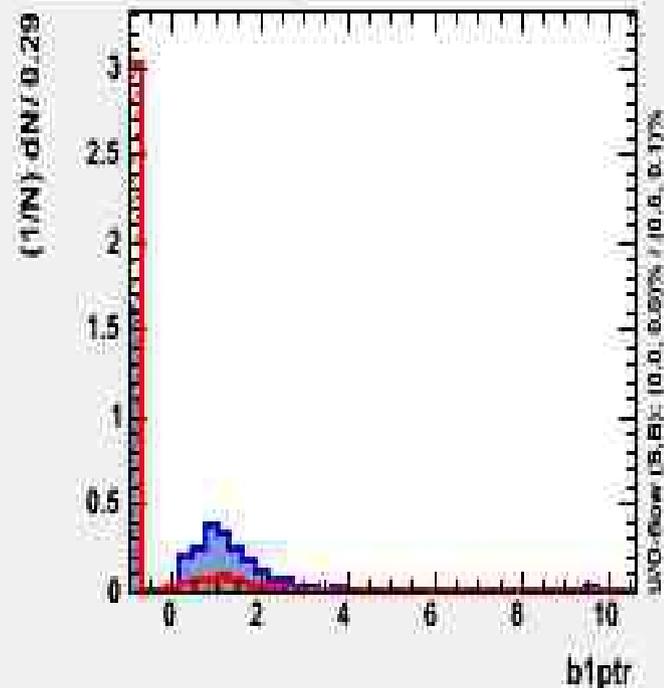
Input variable: w1csv



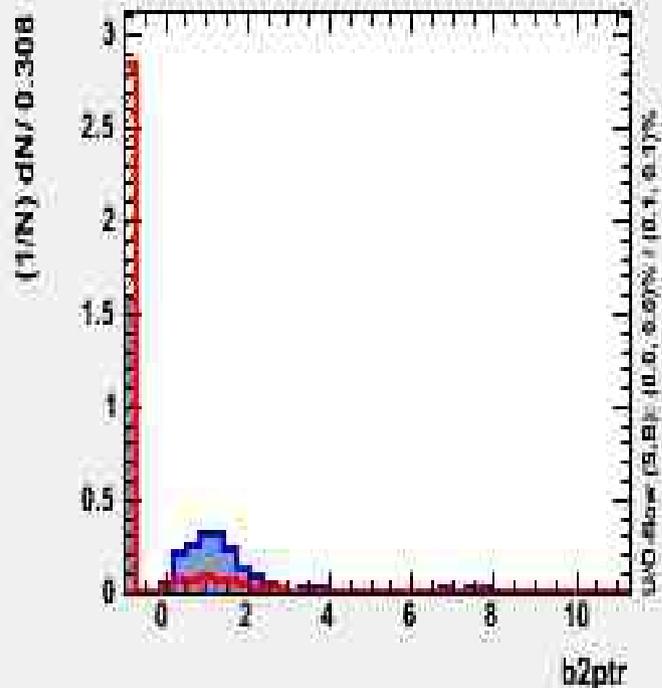
Input variable: w2csv



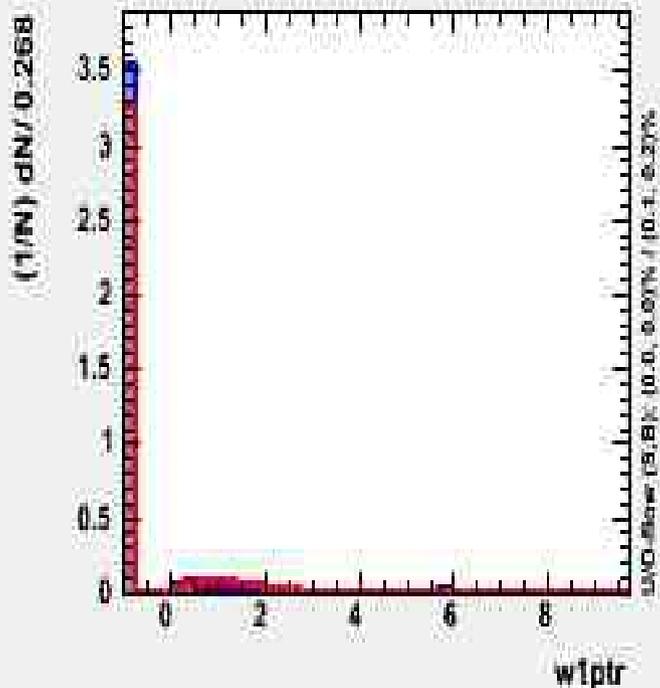
Input variable: b1ptr



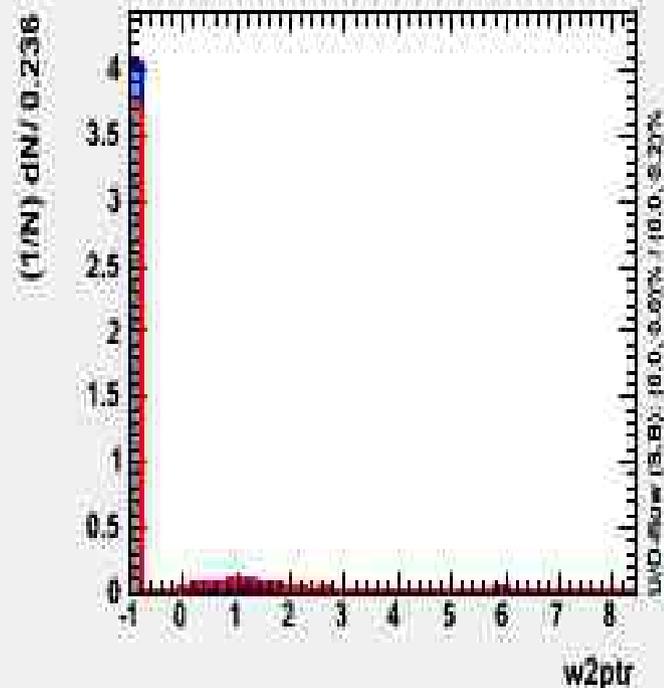
Input variable: b2ptr



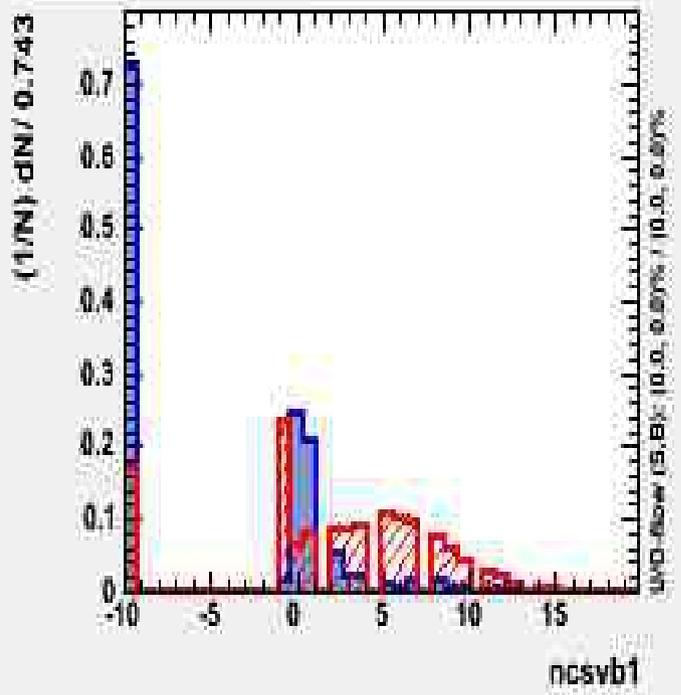
Input variable: w1ptr



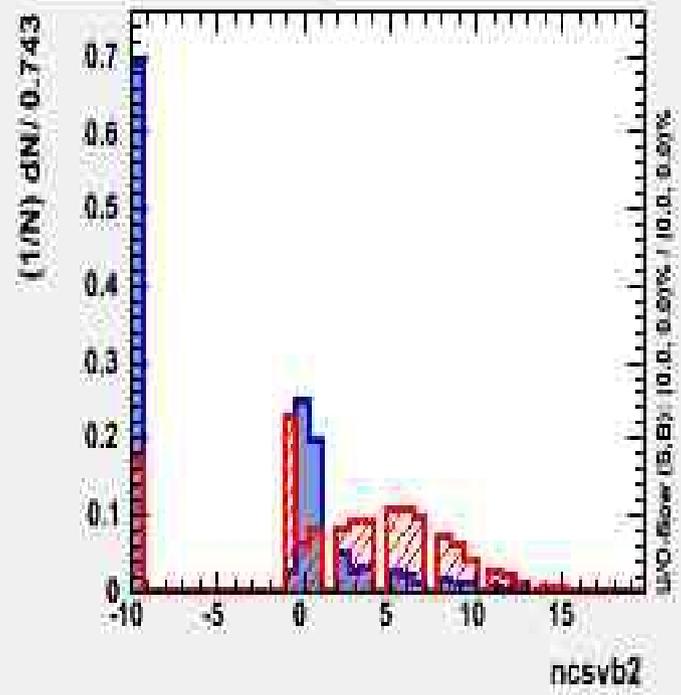
Input variable: w2ptr



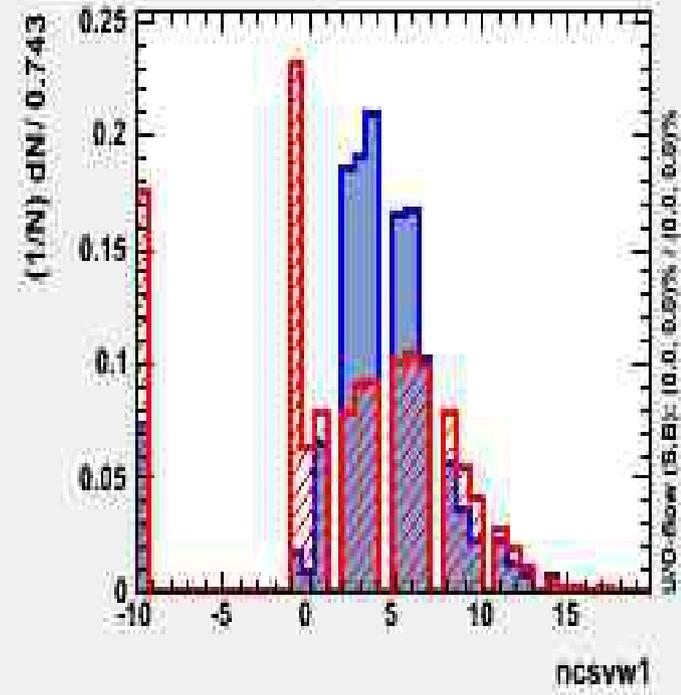
Input variable: ncsvb1



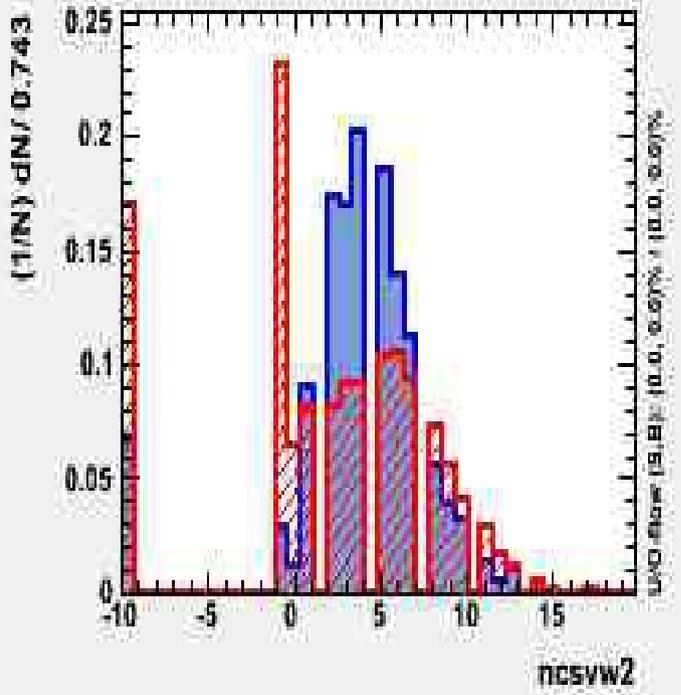
Input variable: ncsvb2



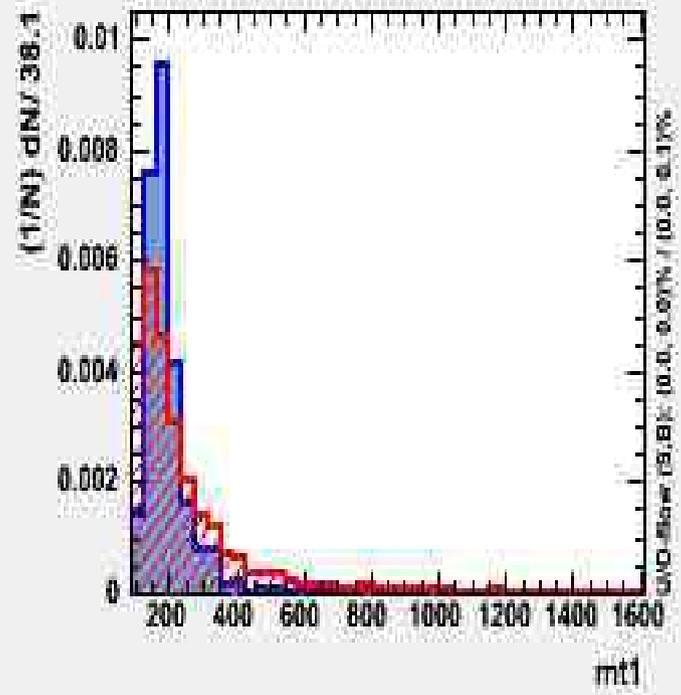
Input variable: ncsvw1



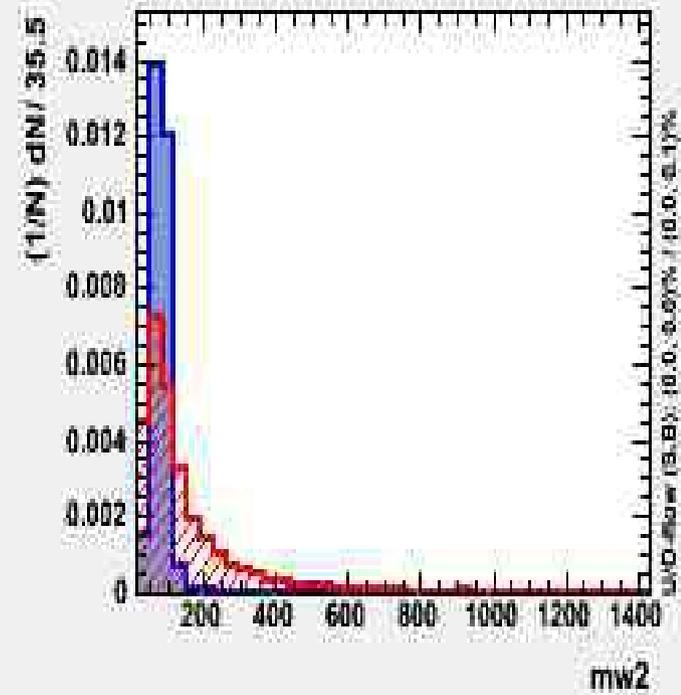
Input variable: ncsvw2



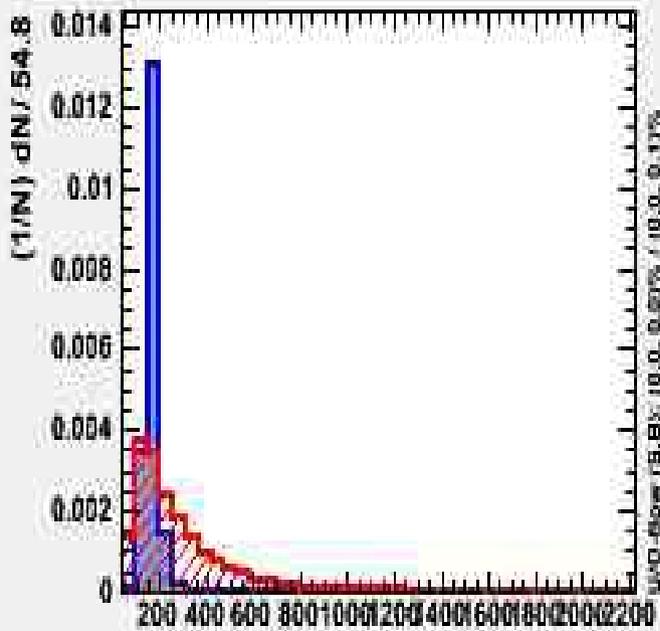
Input variable: mt1



Input variable: mw2

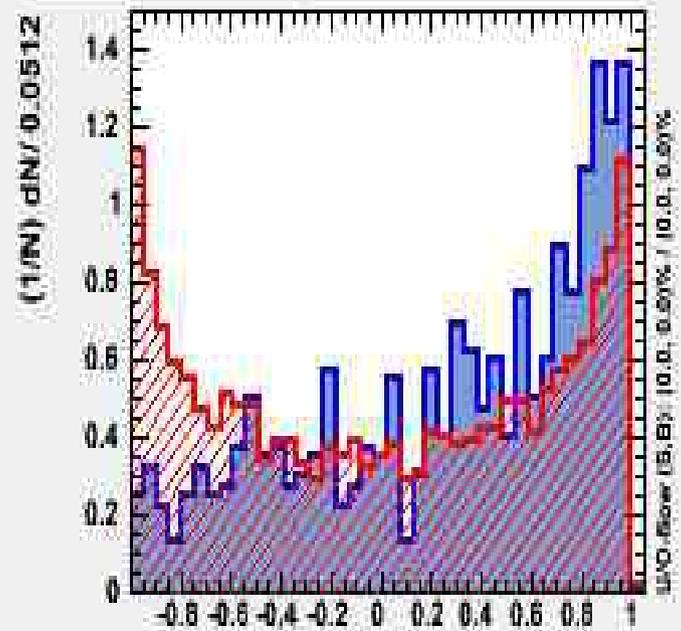


input variable: mt2



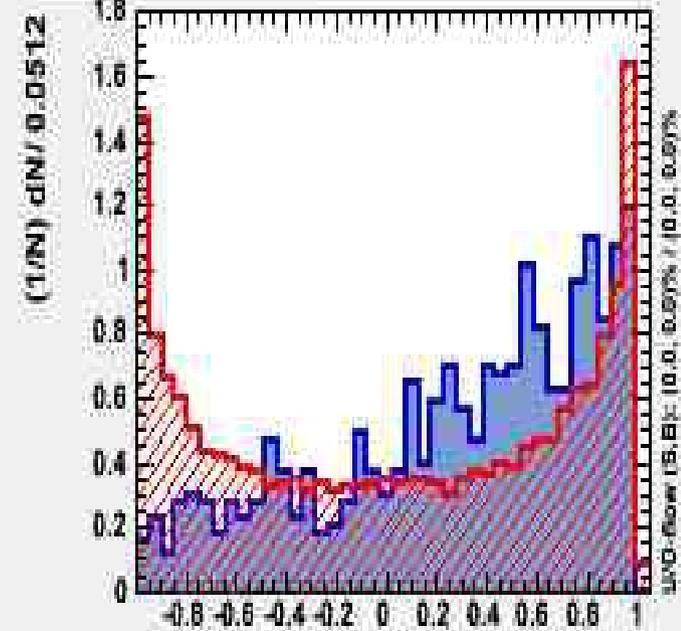
mt2

input variable: cw1b1



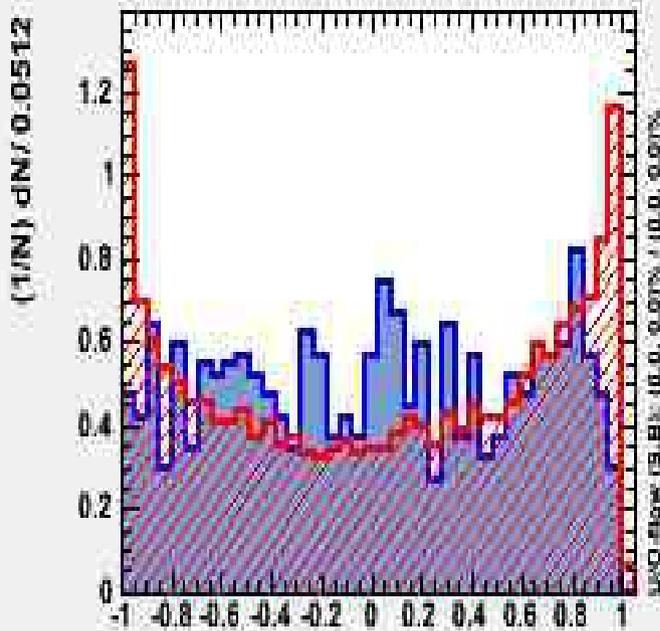
cw1b1

input variable: cw2b2



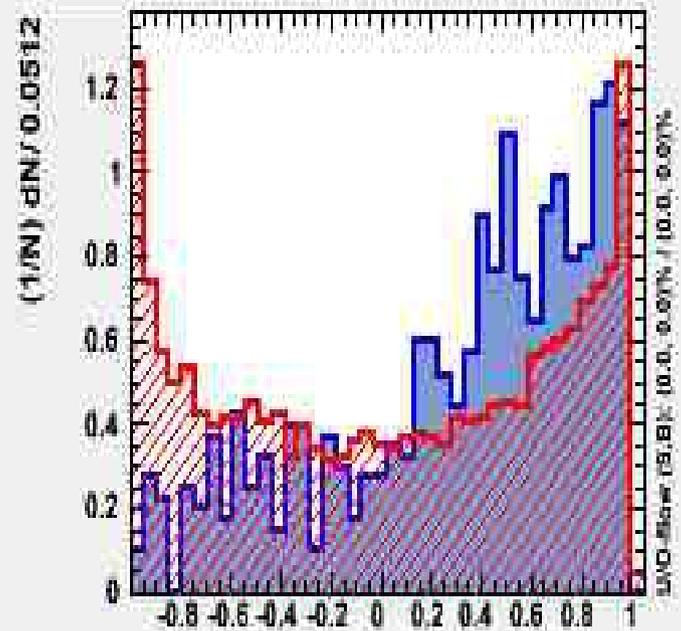
cw2b2

input variable: cb1b2



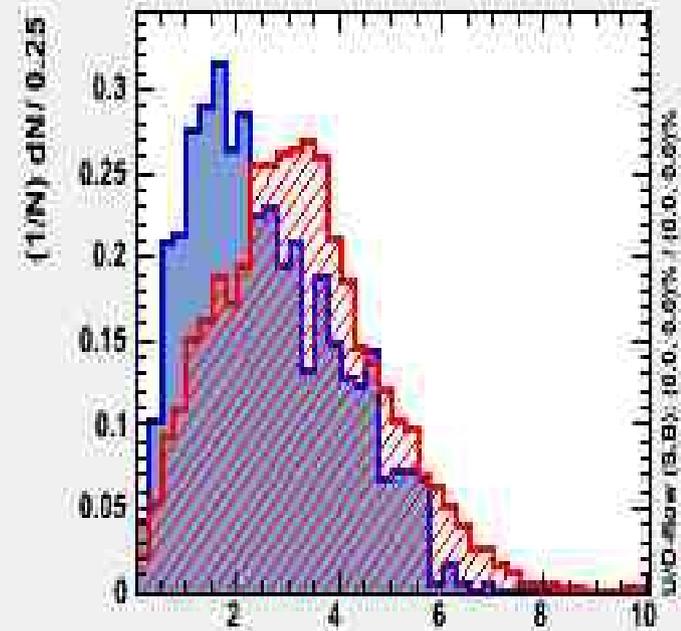
cb1b2

input variable: cjw1w2



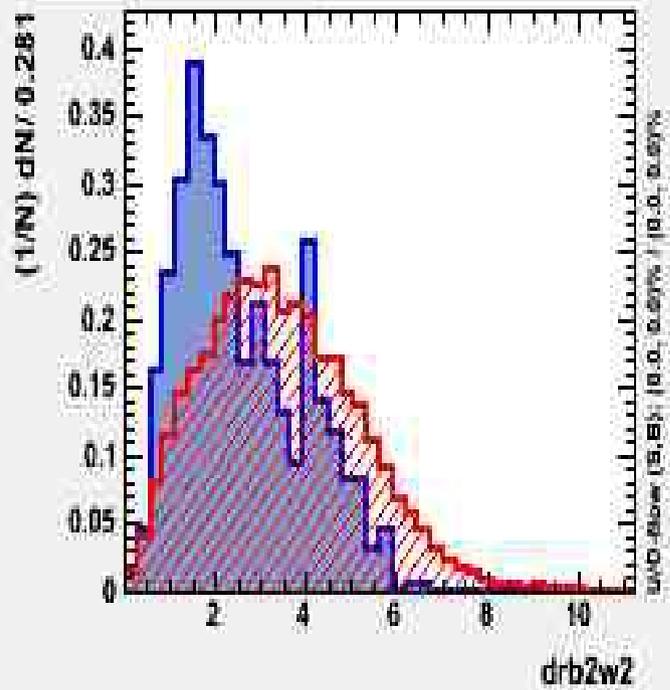
cjw1w2

input variable: drb1w1

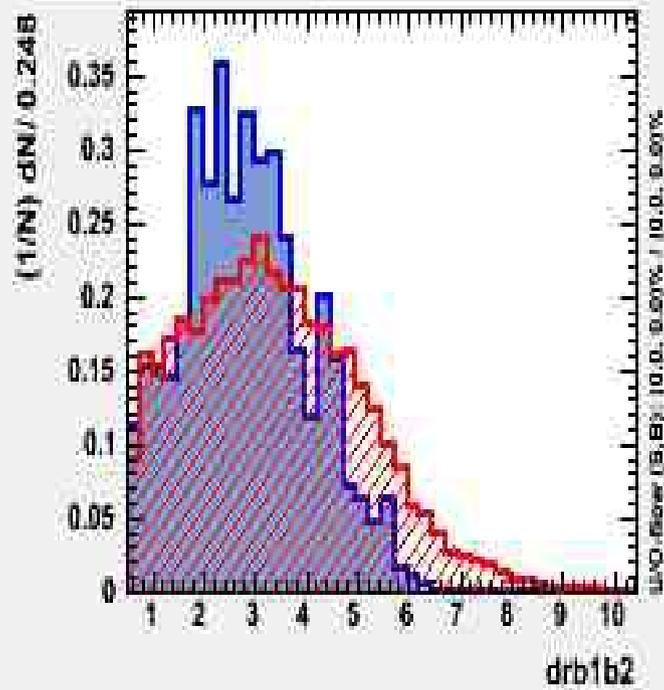


drb1w1

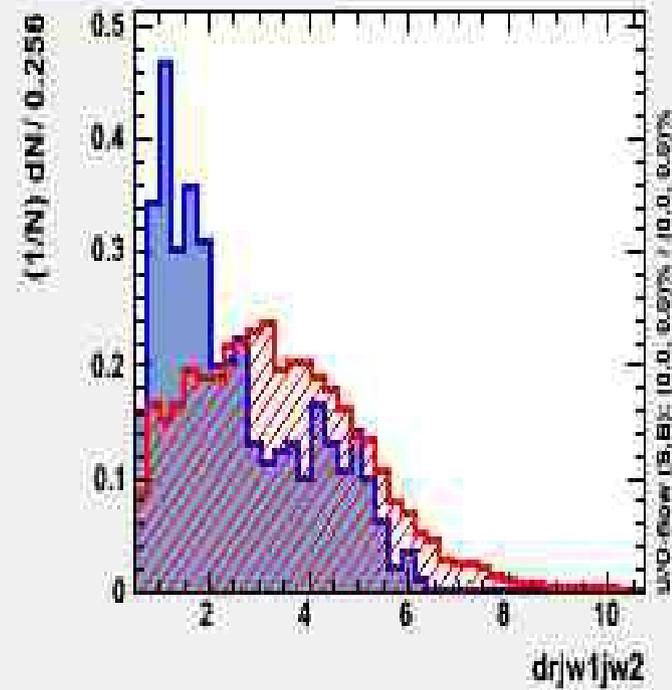
Input variable: drb3w2



Input variable: drb1b2

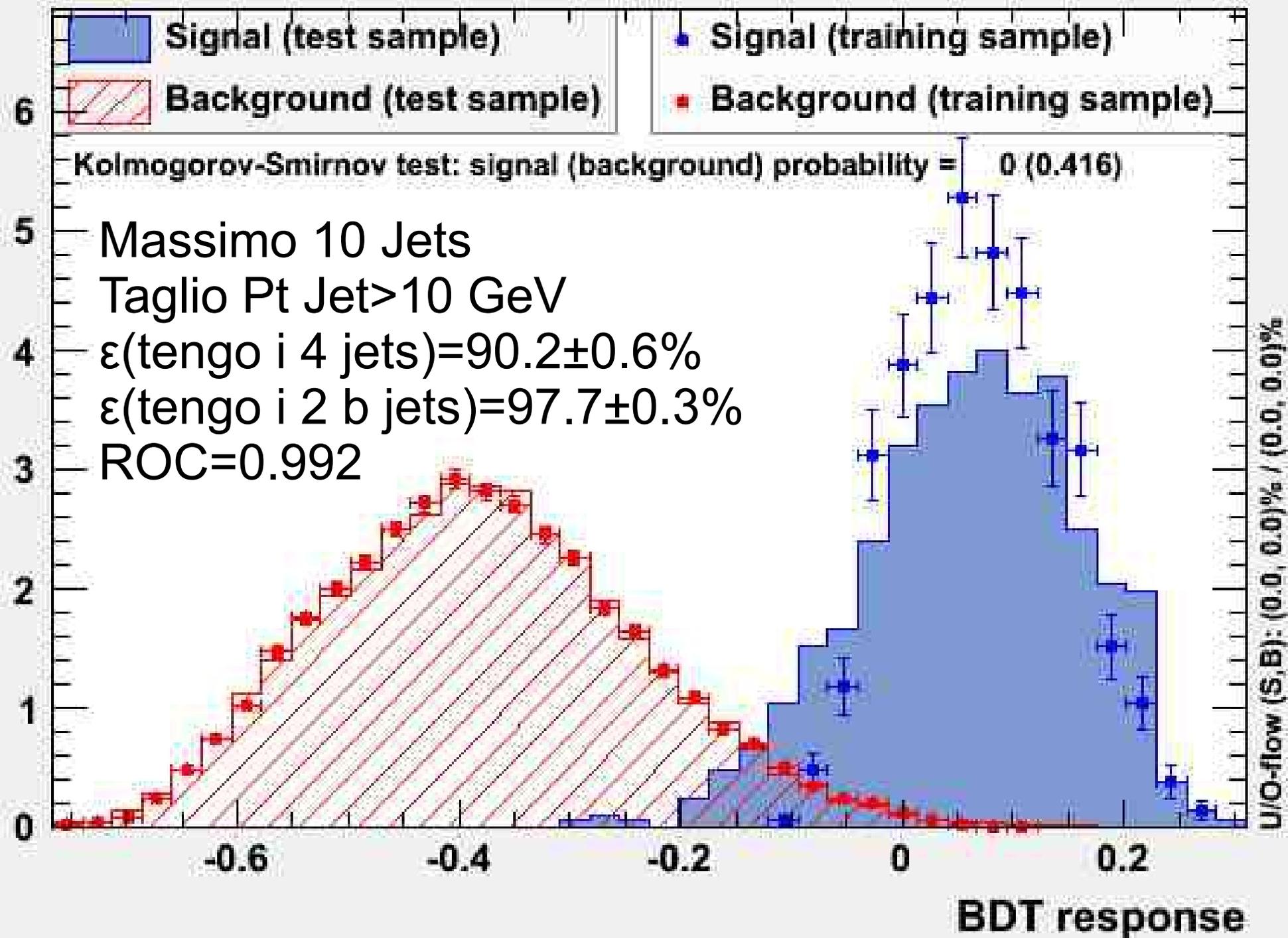


Input variable: drjw1jw2

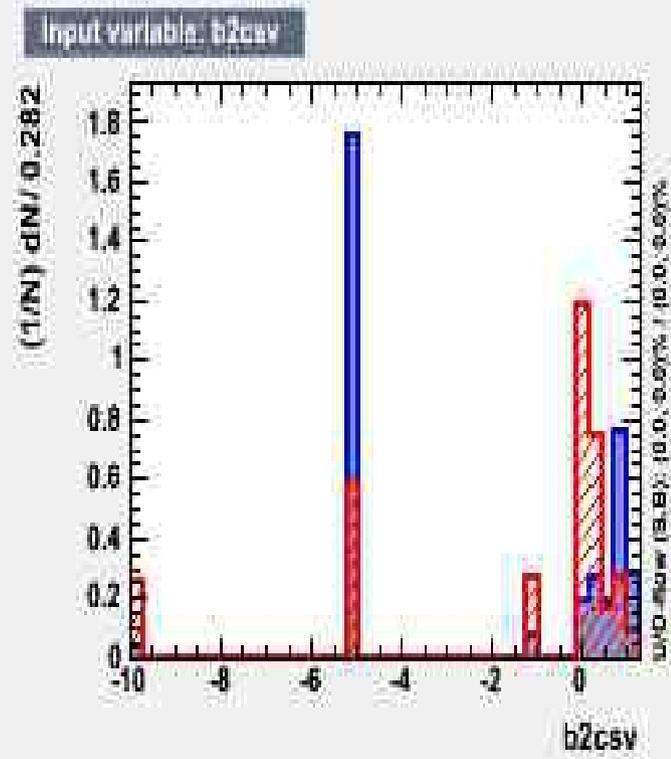
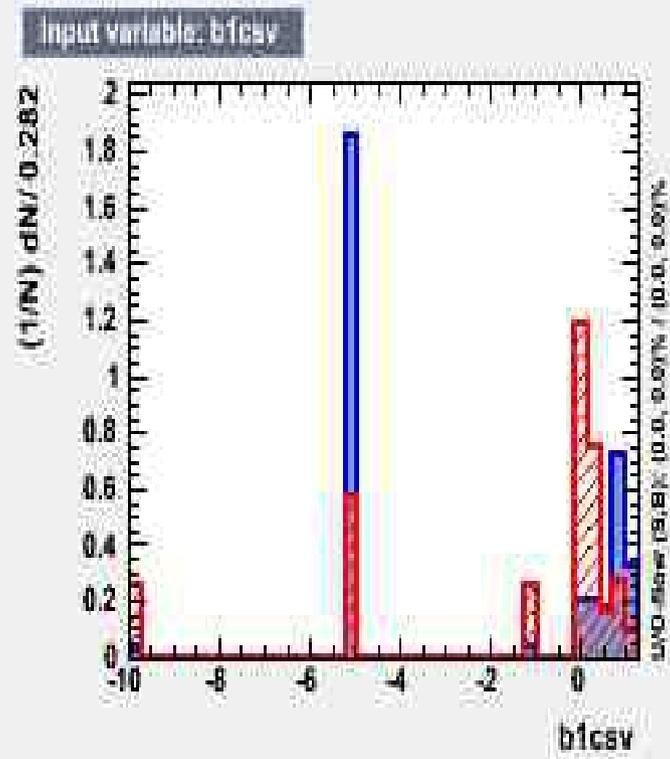
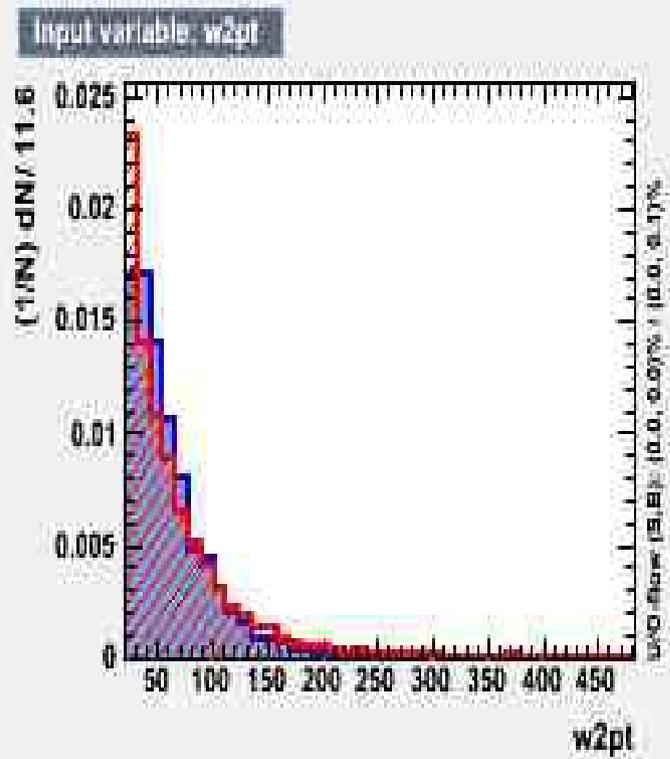
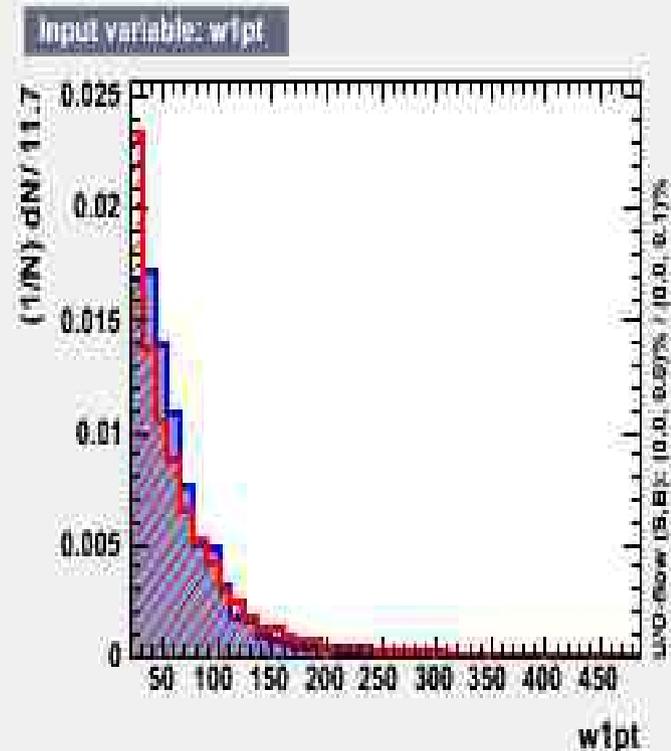
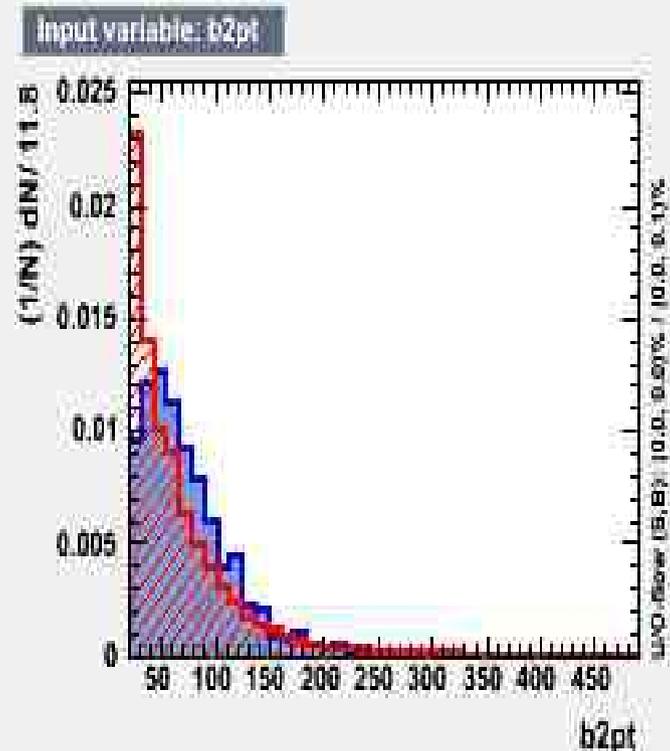
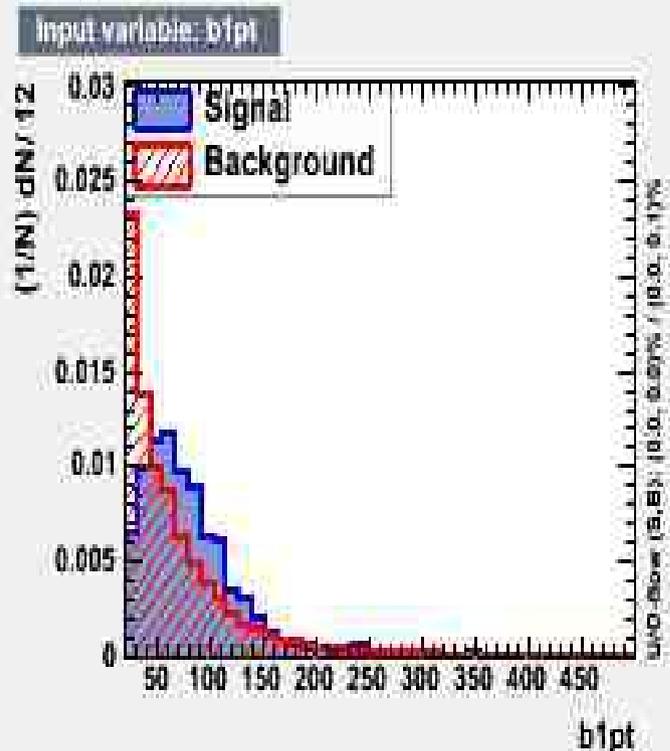


TMVA overtraining check for classifier: BDT

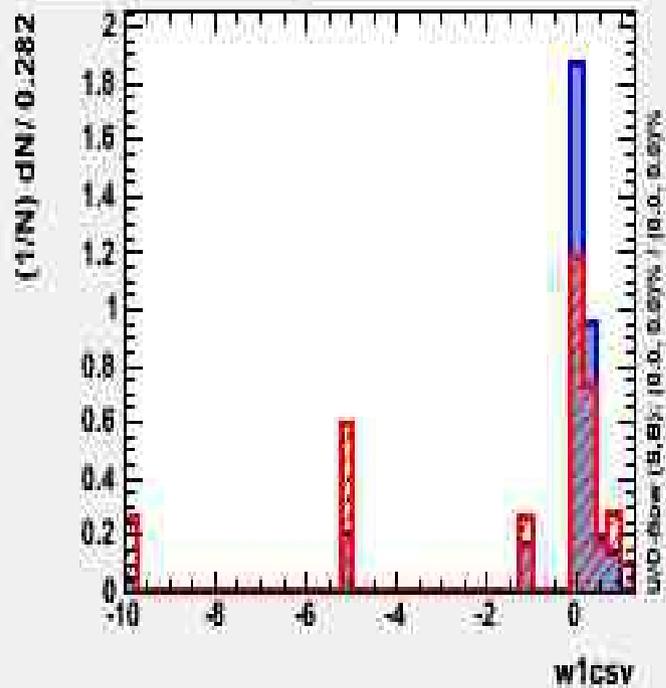
$(1/N) dN/dx$



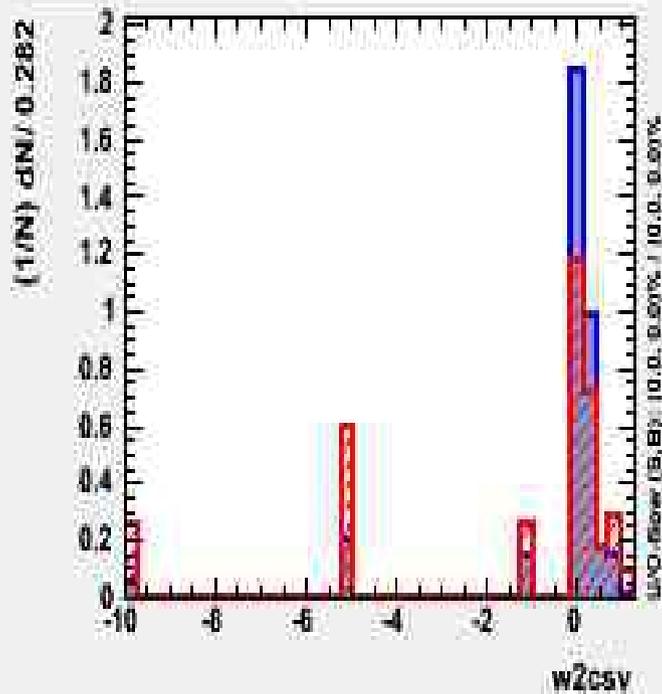
Massimo 10 Jets
Taglio Pt Jet > 20 GeV



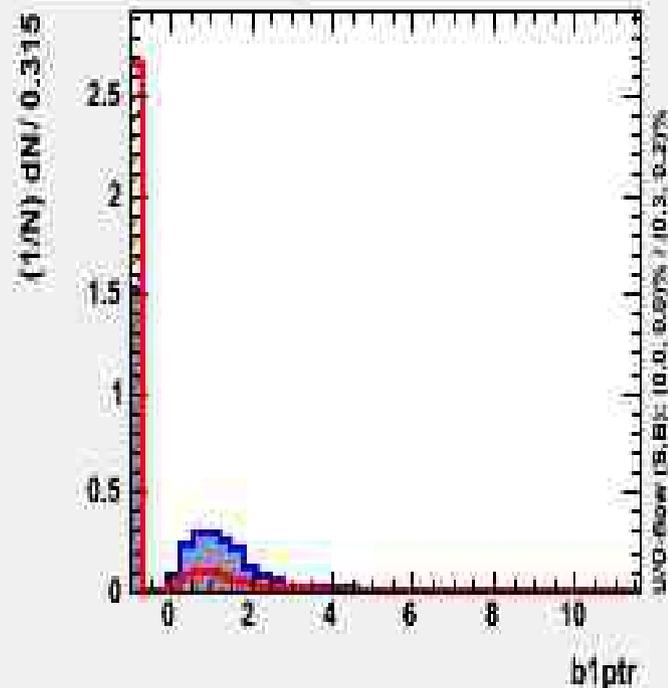
Input variable: w1csv



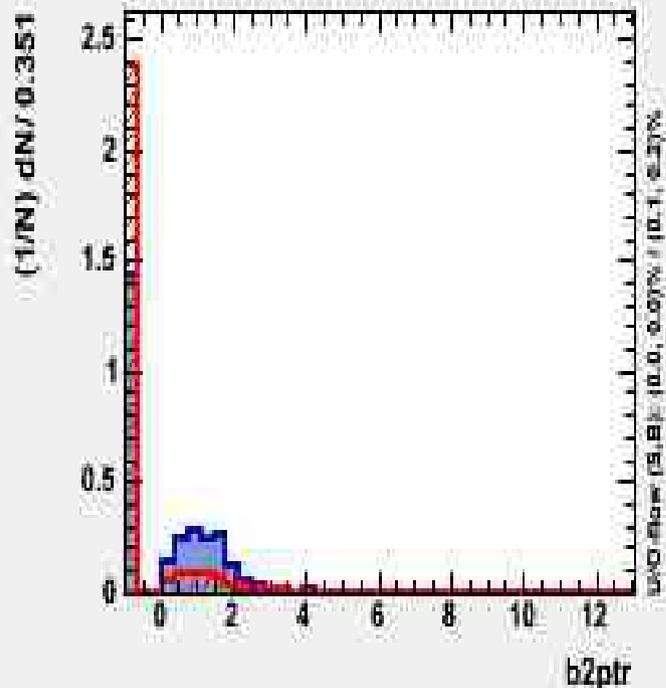
Input variable: w2csv



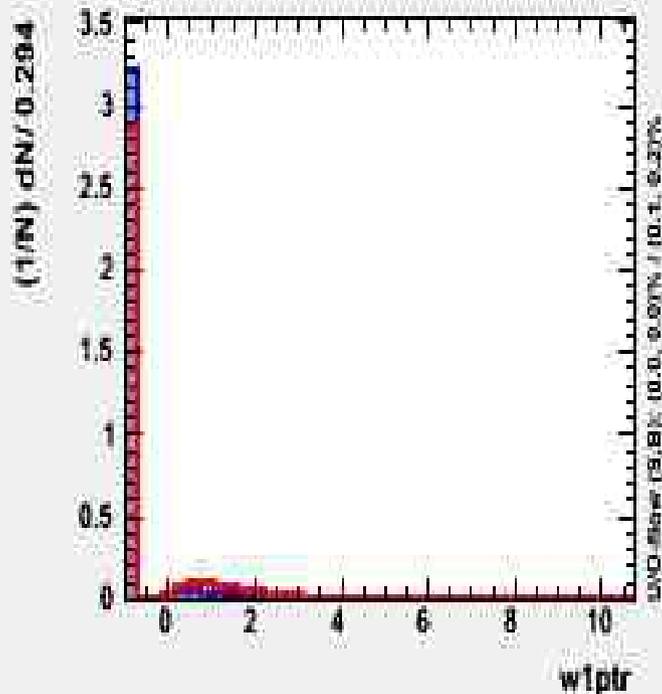
Input variable: b1ptr



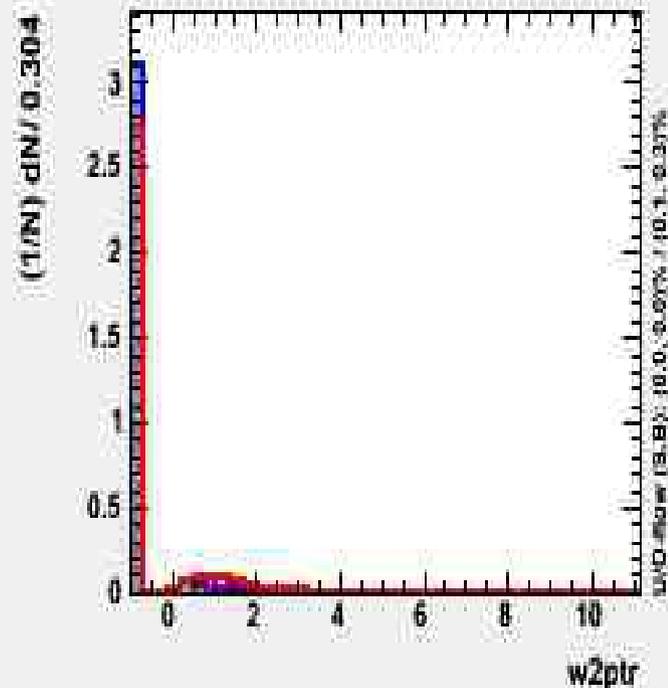
Input variable: b2ptr



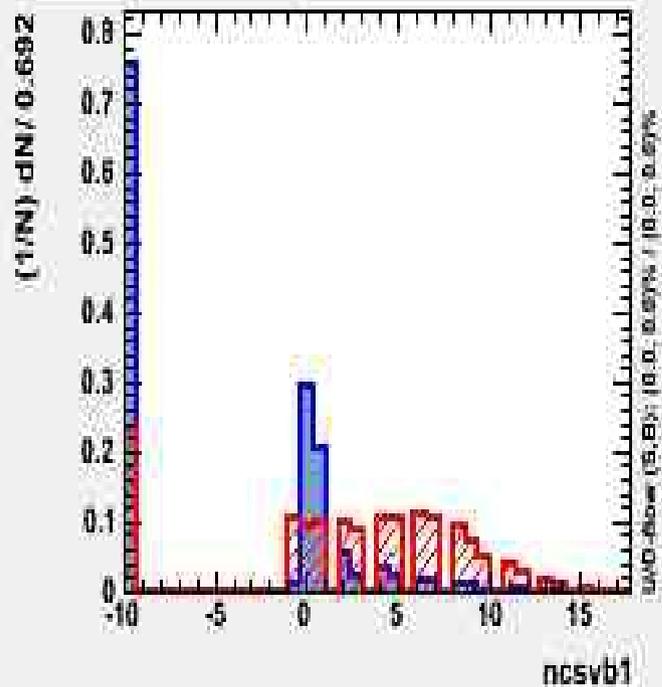
Input variable: w1ptr



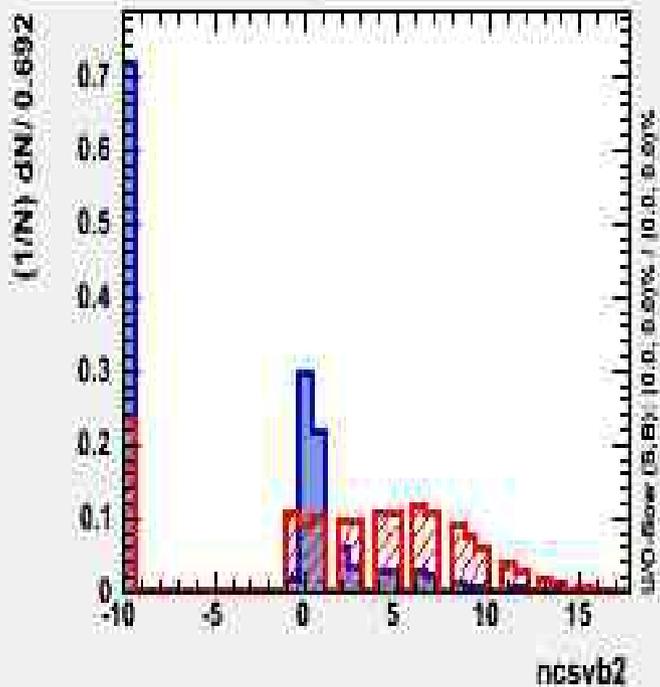
Input variable: w2ptr



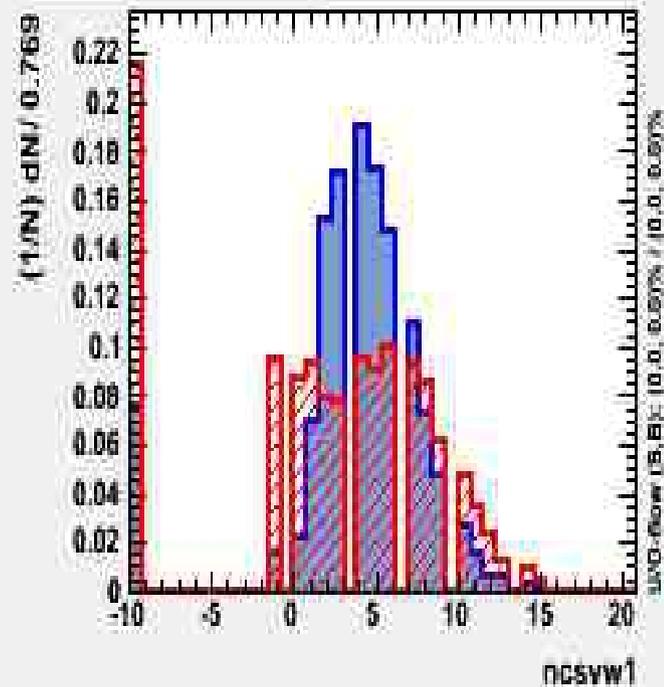
Input variable: ncsvb1



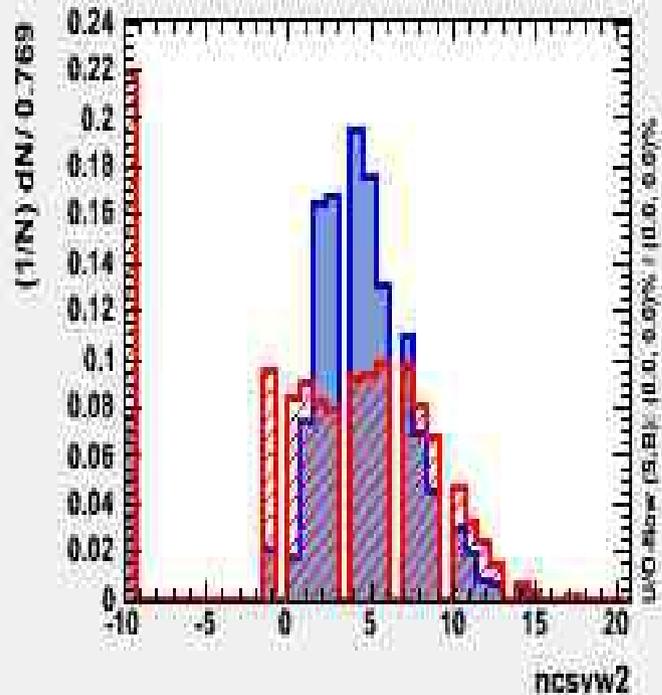
Input variable: ncsvb2



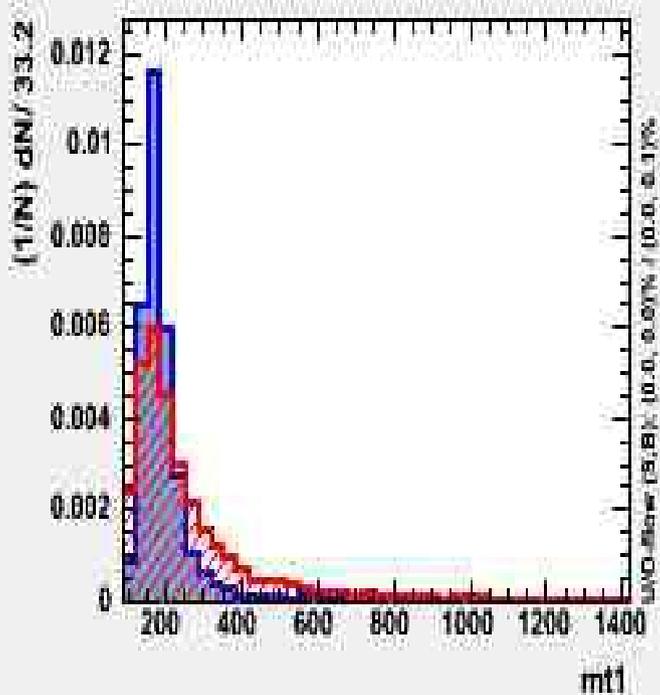
Input variable: ncsvw1



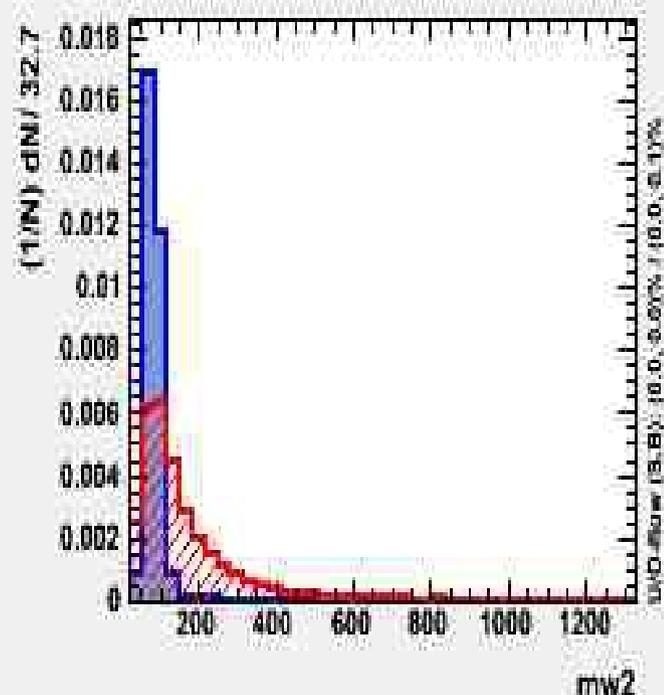
Input variable: ncsvw2



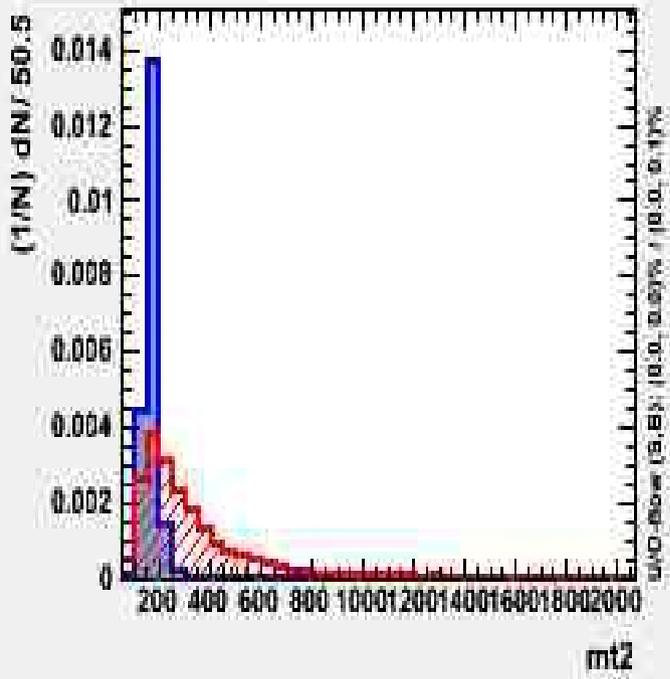
Input variable: mt1



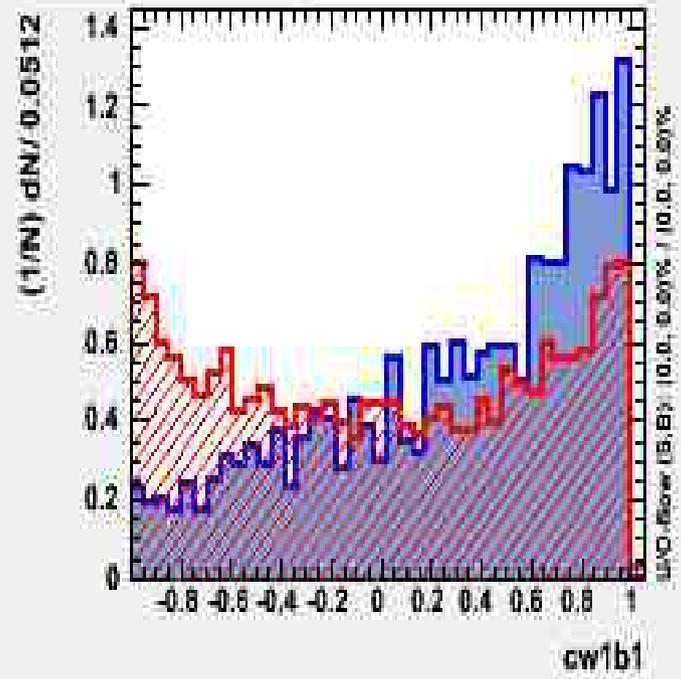
Input variable: mw2



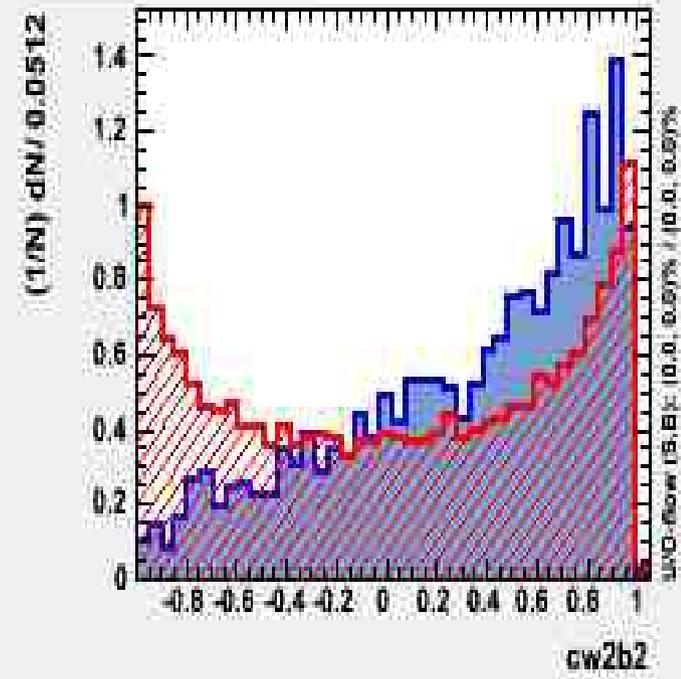
Input variable: mt2



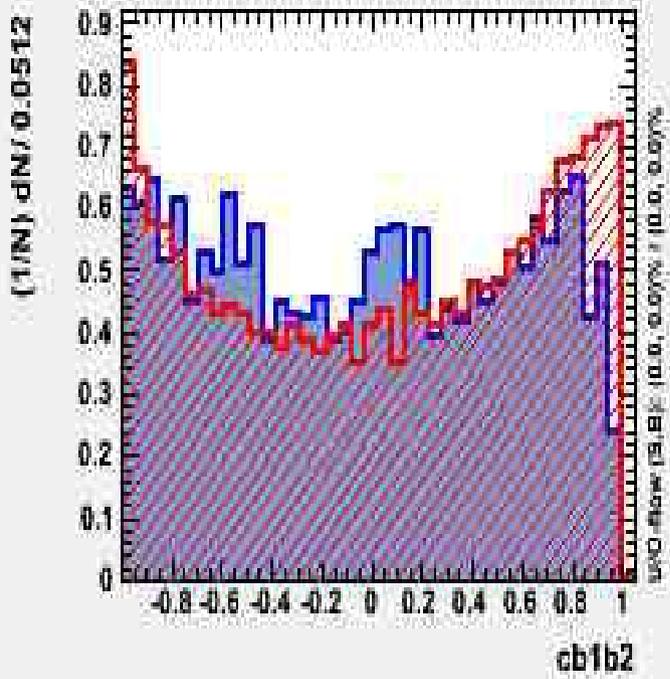
Input variable: cw1b1



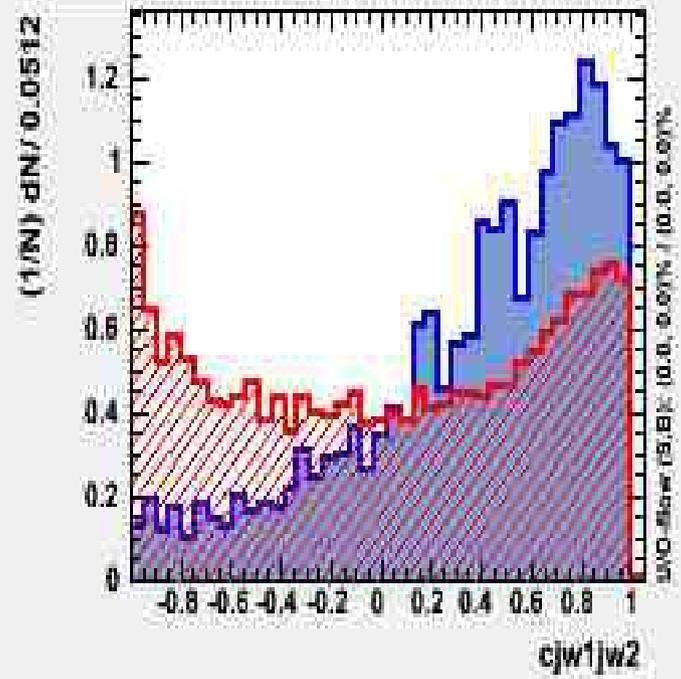
Input variable: cw2b2



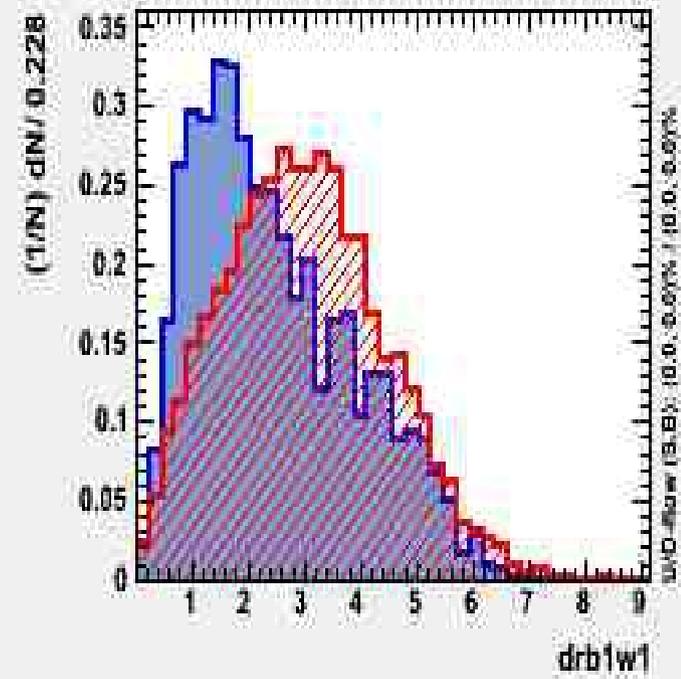
Input variable: cb1b2



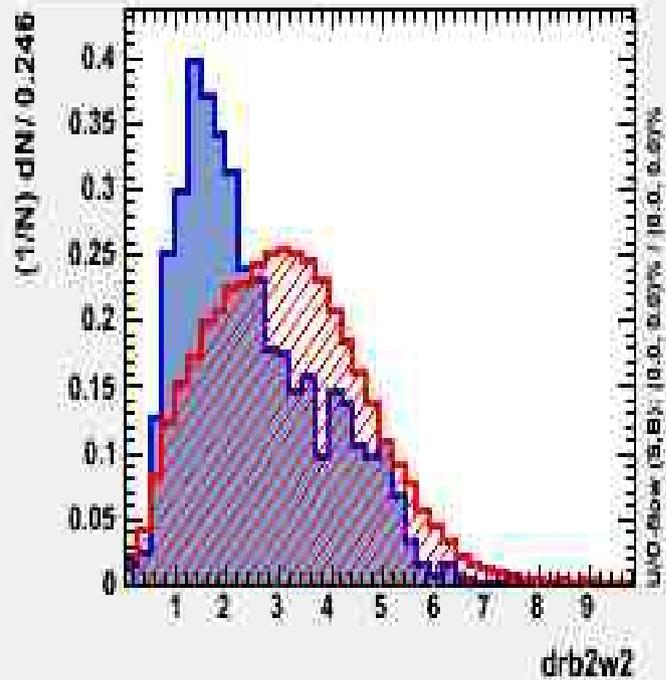
Input variable: cjw1w2



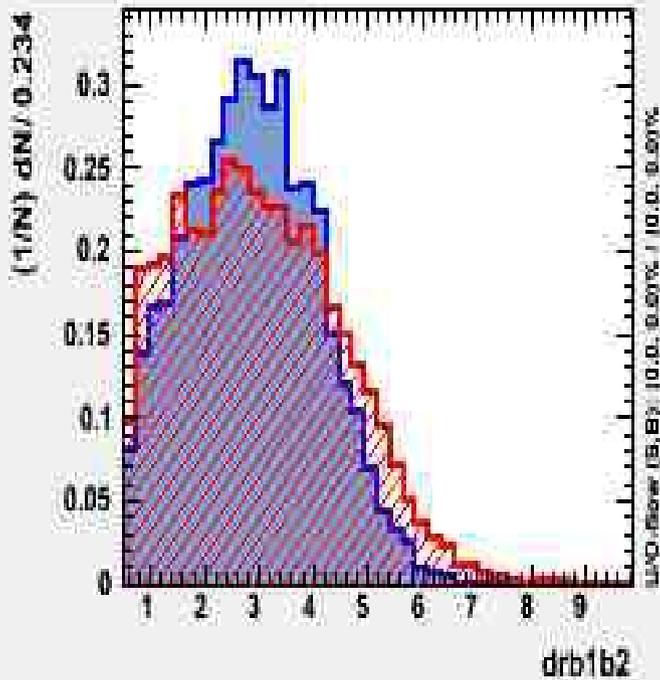
Input variable: drb1w1



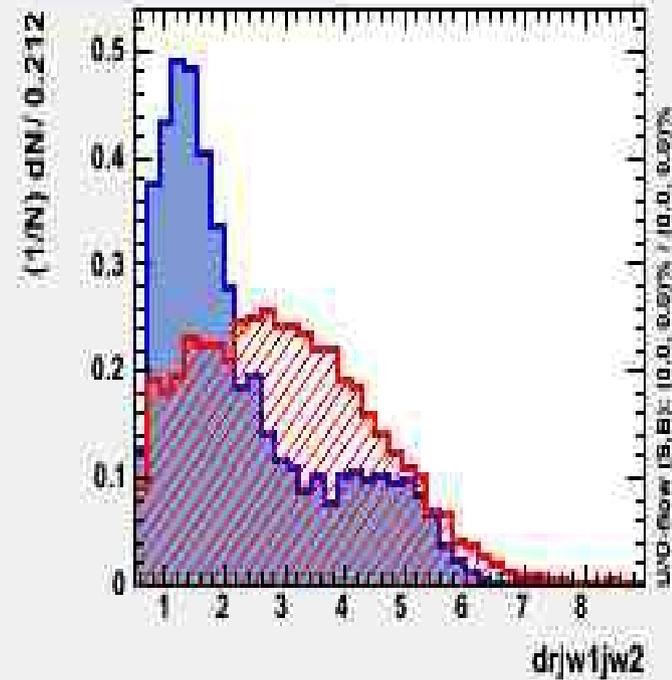
Input variable: drb2w2



Input variable: drb1b2

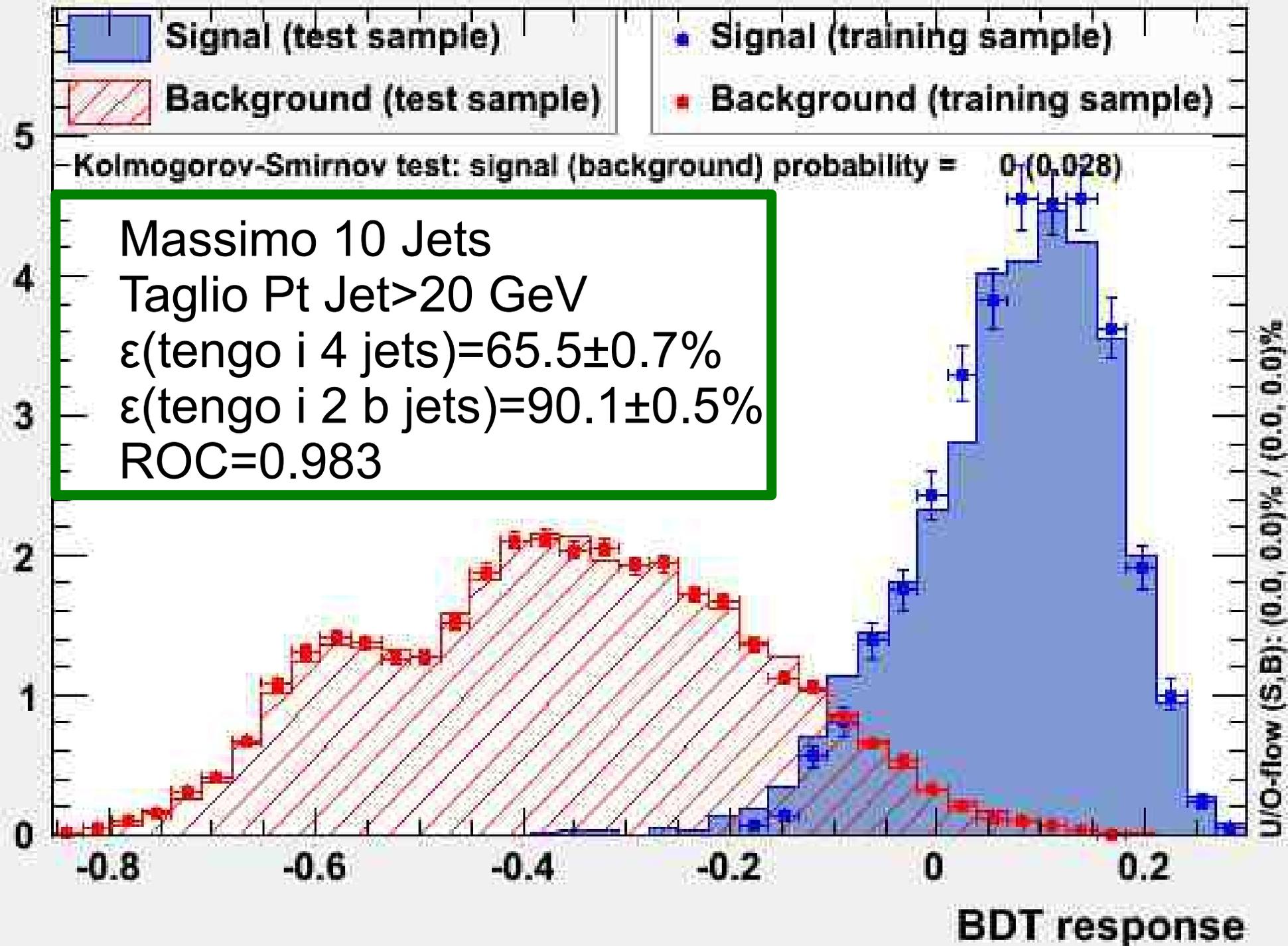


Input variable: drjw1jw2



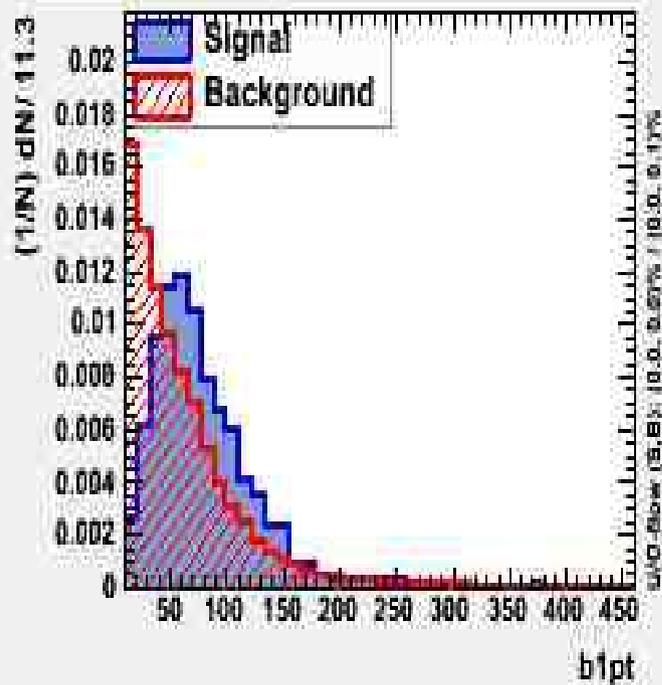
TMVA overtraining check for classifier: BDT

$(1/N) dN/dx$

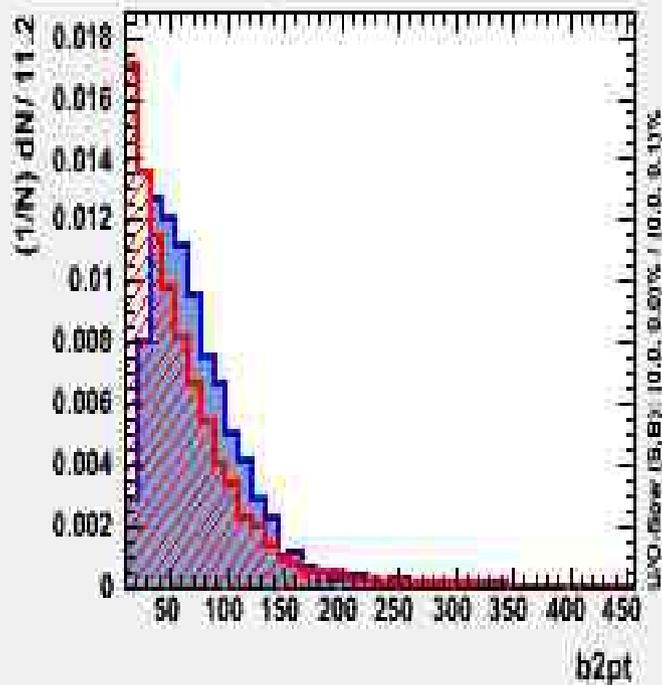


Massimo 6 Jets
Taglio Pt Jet > 10 GeV

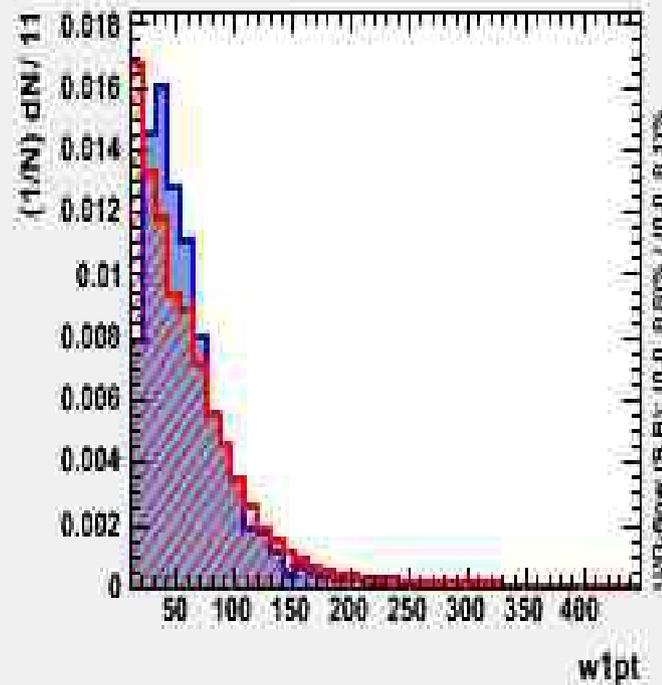
Input variable: b1pt



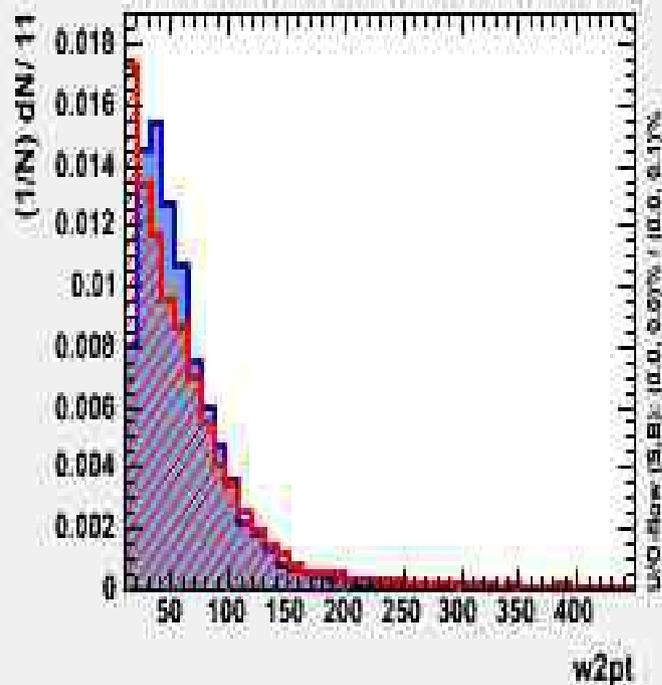
Input variable: b2pt



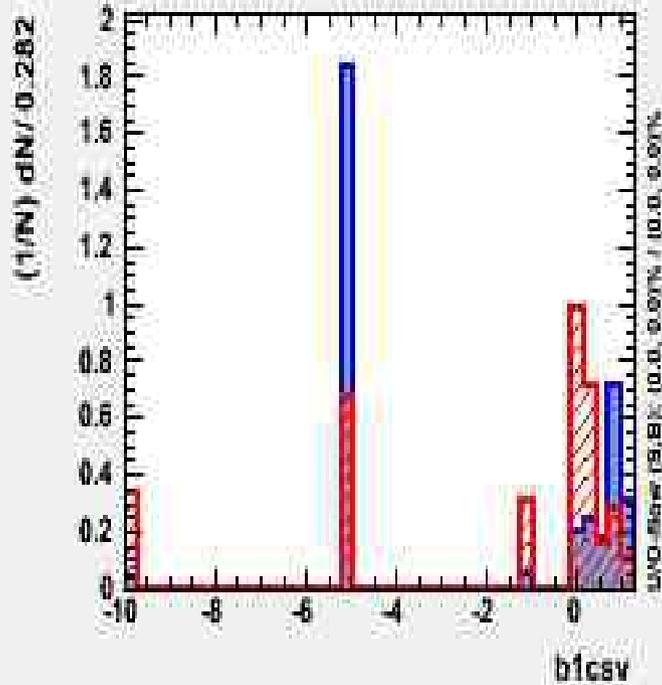
Input variable: w1pt



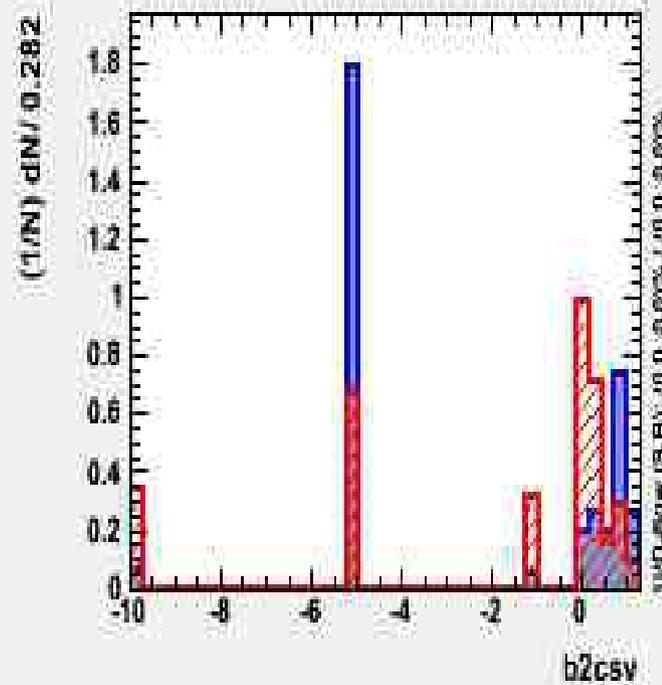
Input variable: w2pt



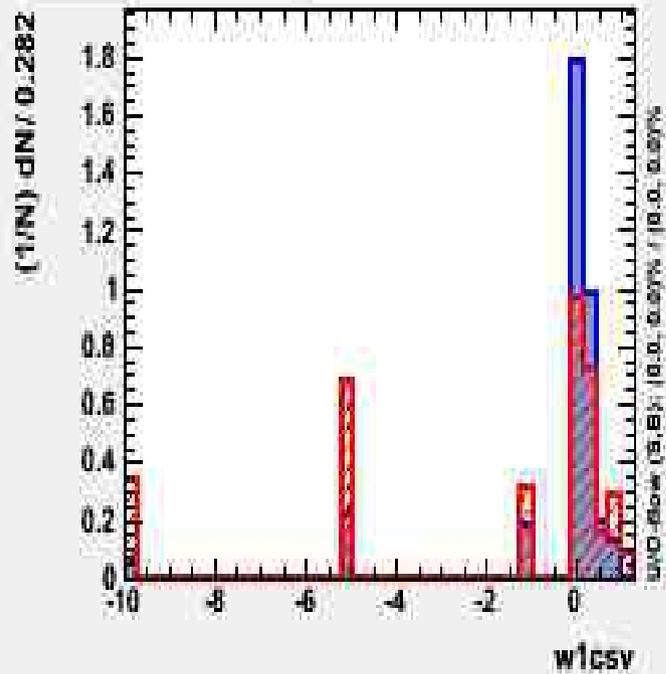
Input variable: b1csv



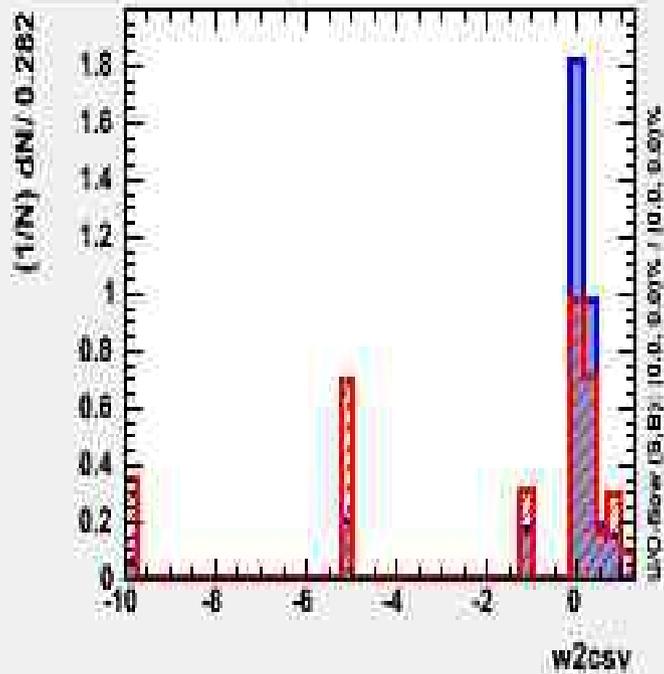
Input variable: b2csv



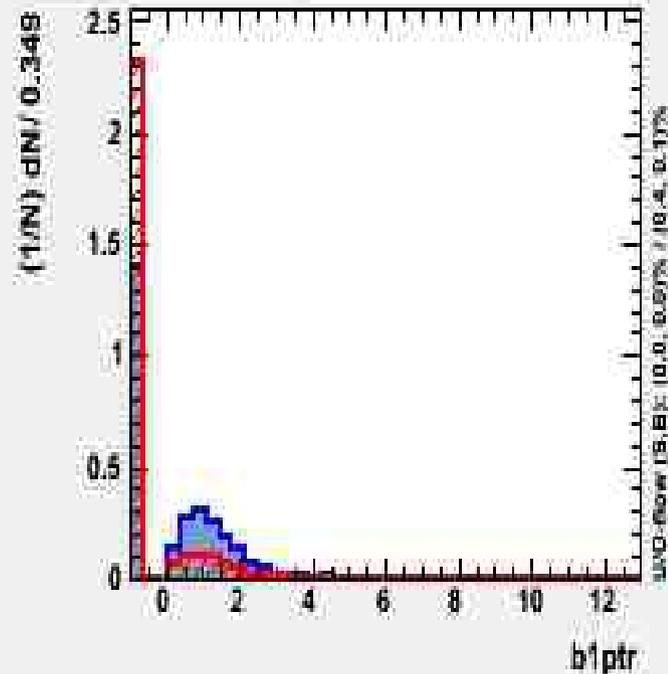
Input variable: w1csv



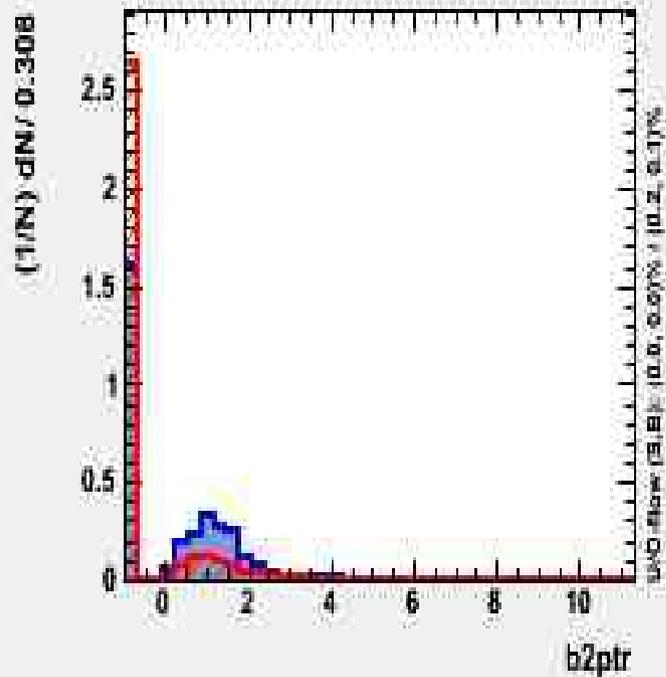
Input variable: w2csv



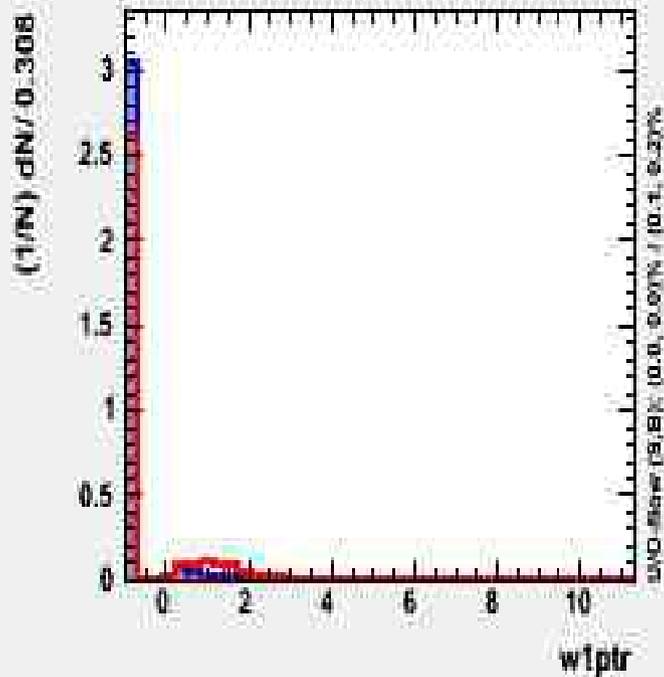
Input variable: b1ptr



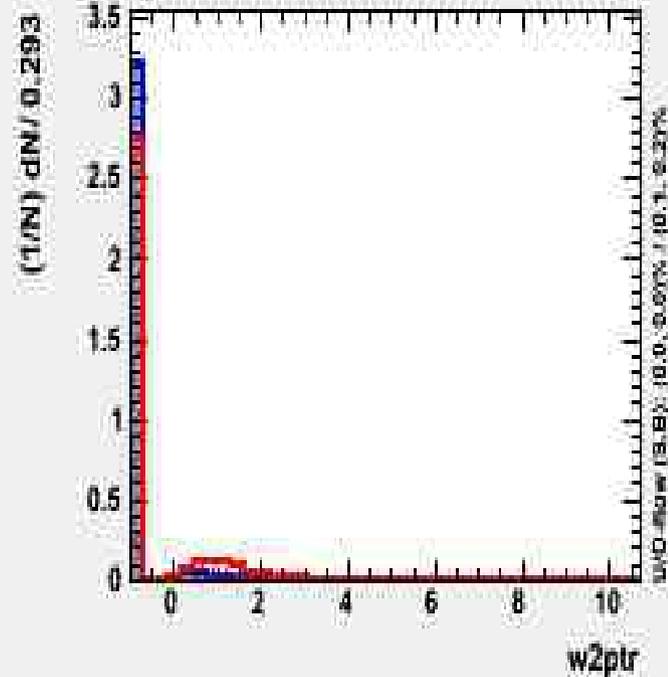
Input variable: b2ptr



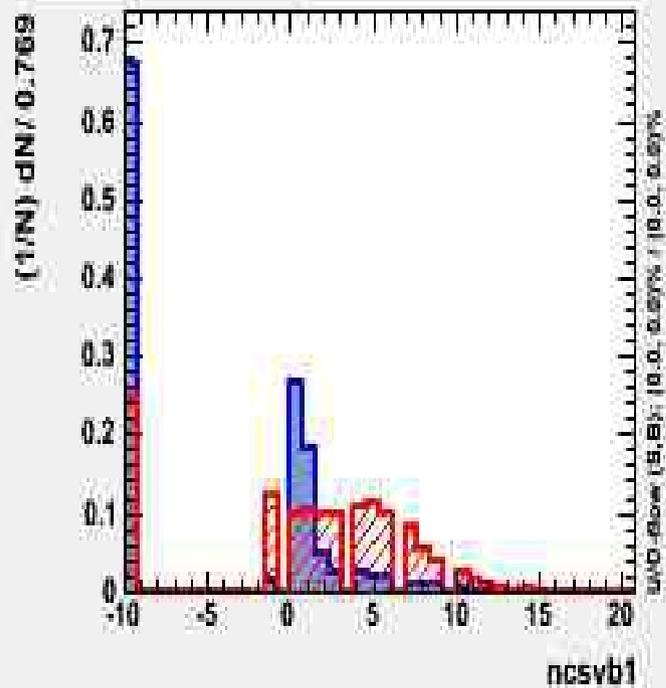
Input variable: w1ptr



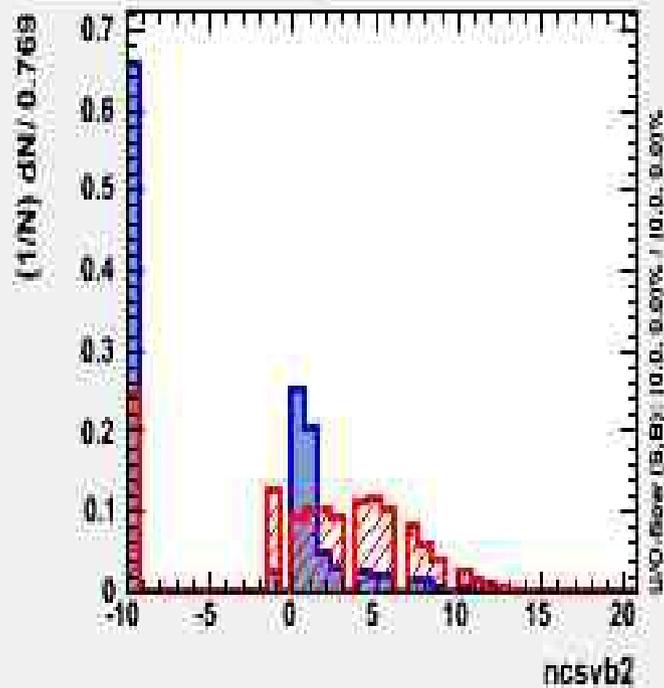
Input variable: w2ptr



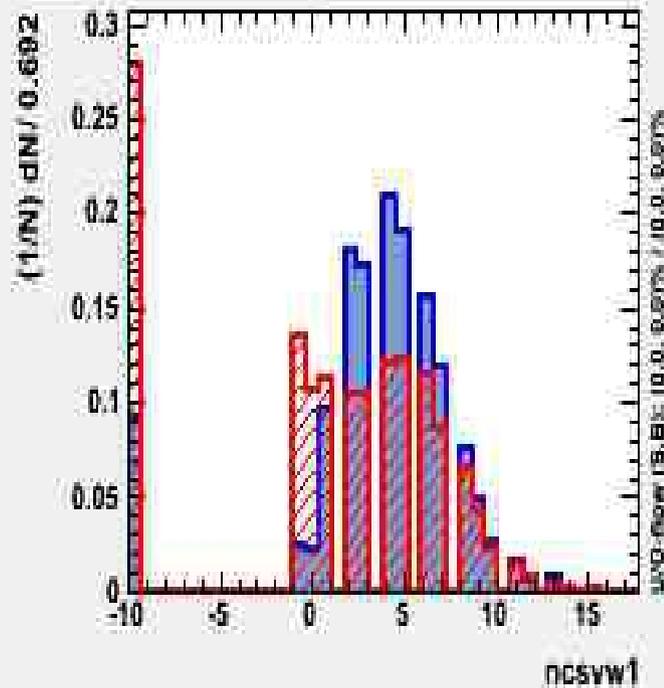
Input variable: ncsvb1



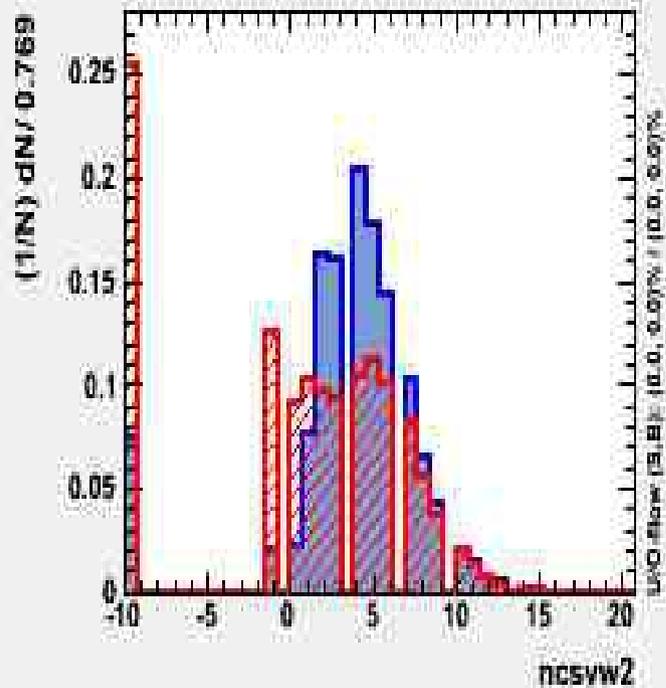
Input variable: ncsvb2



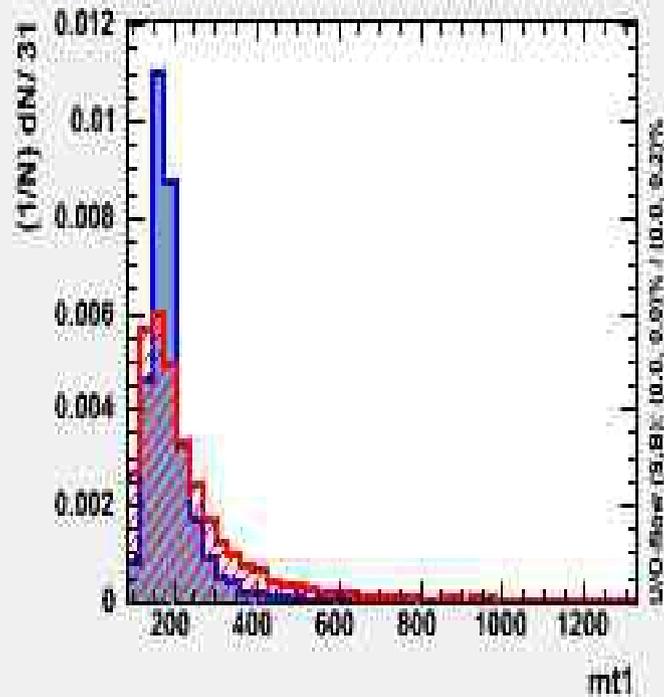
Input variable: ncsvw1



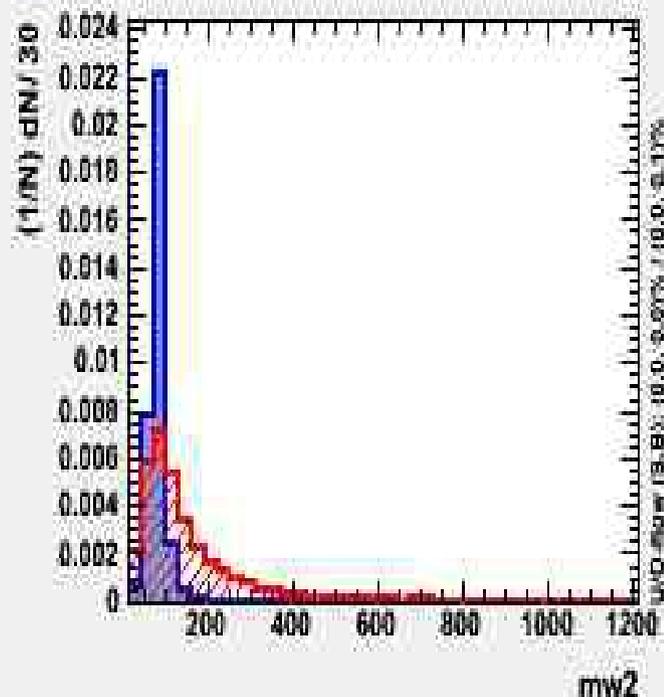
Input variable: ncsvw2



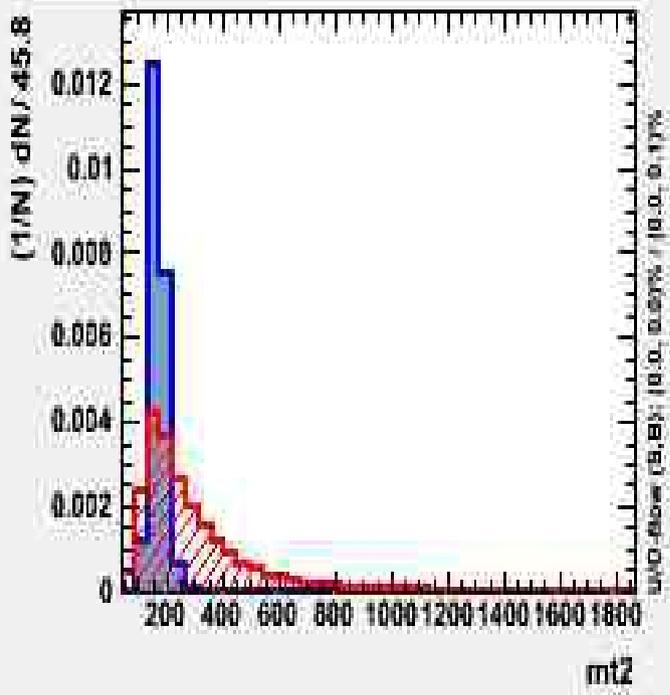
Input variable: mt1



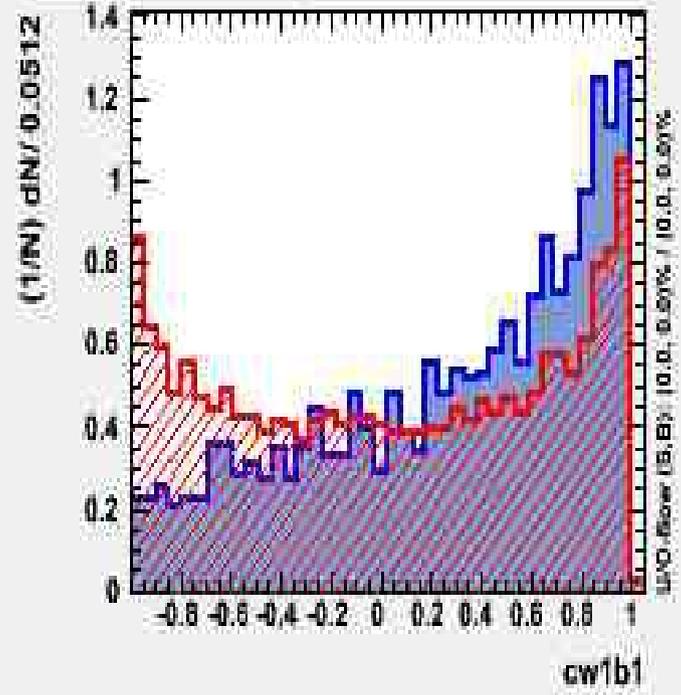
Input variable: mw2



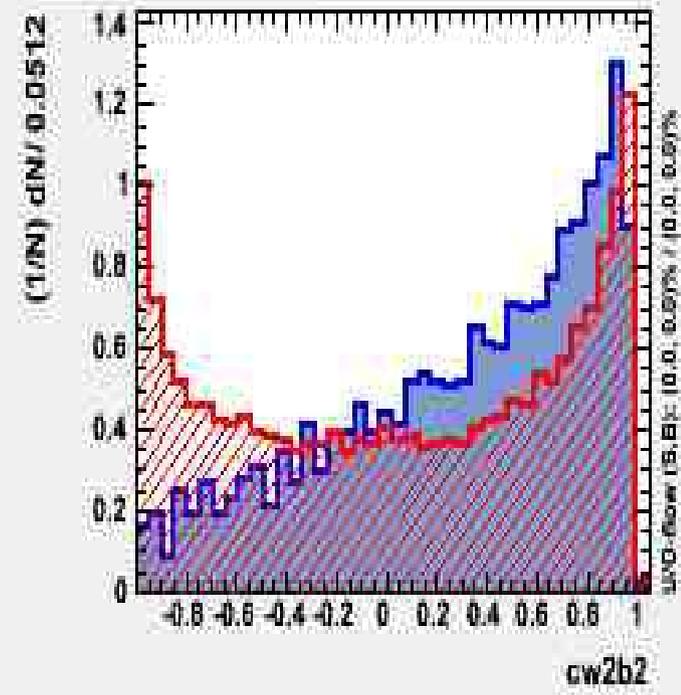
input variable: mt2



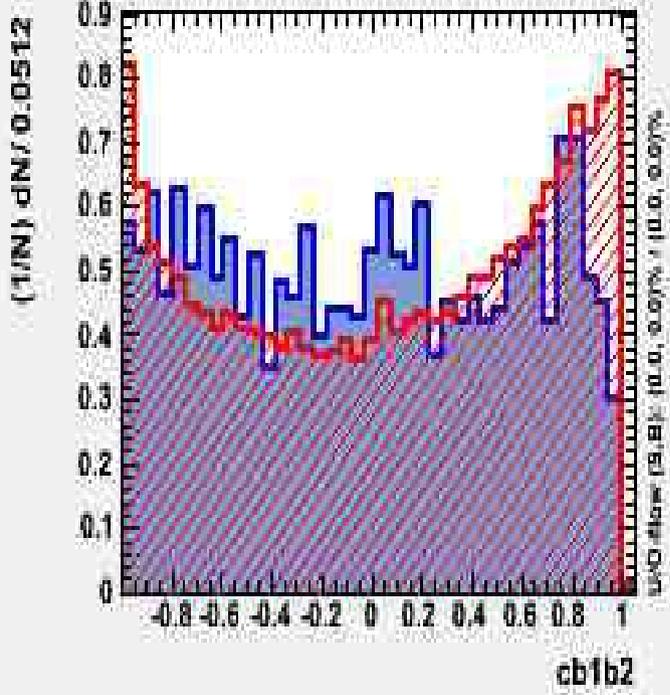
input variable: cw1b1



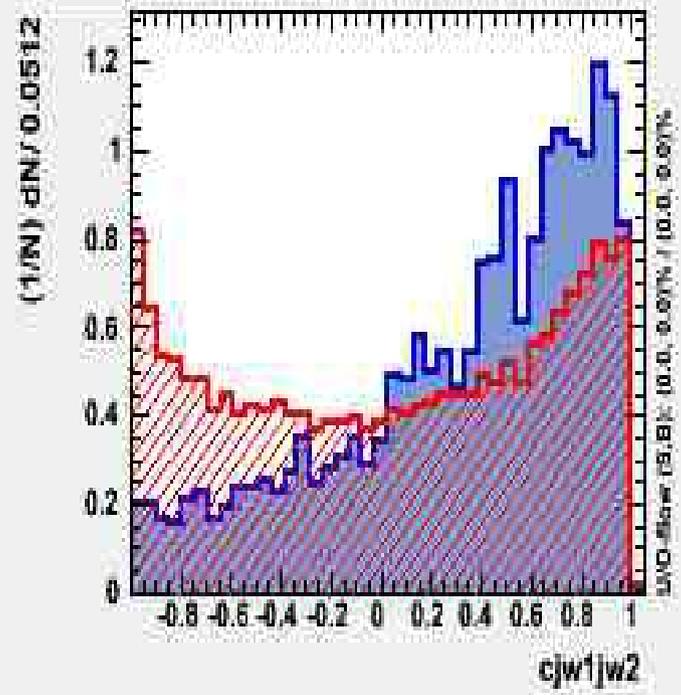
input variable: cw2b2



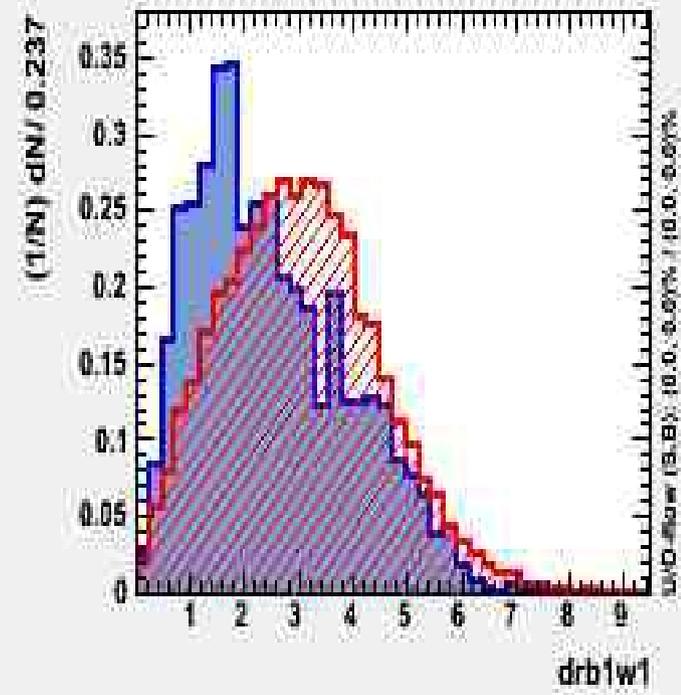
input variable: cb1b2



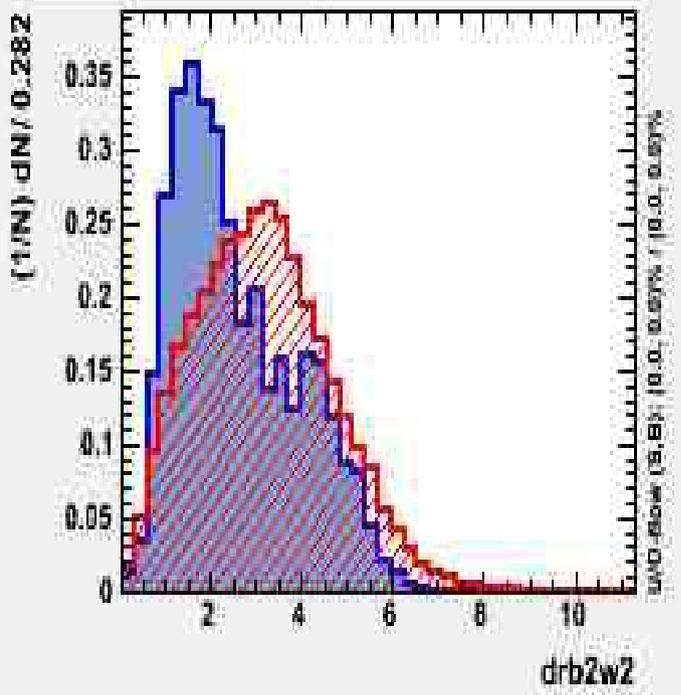
input variable: cjw1w2



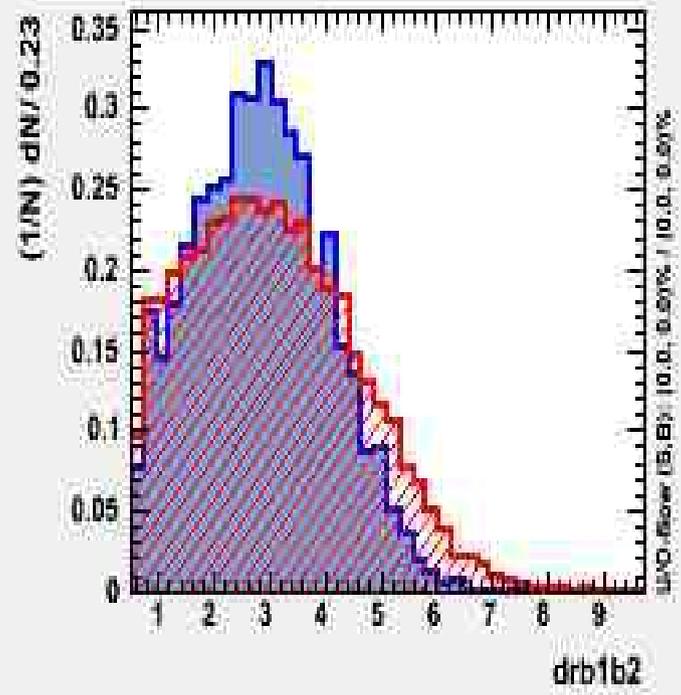
input variable: drb1w1



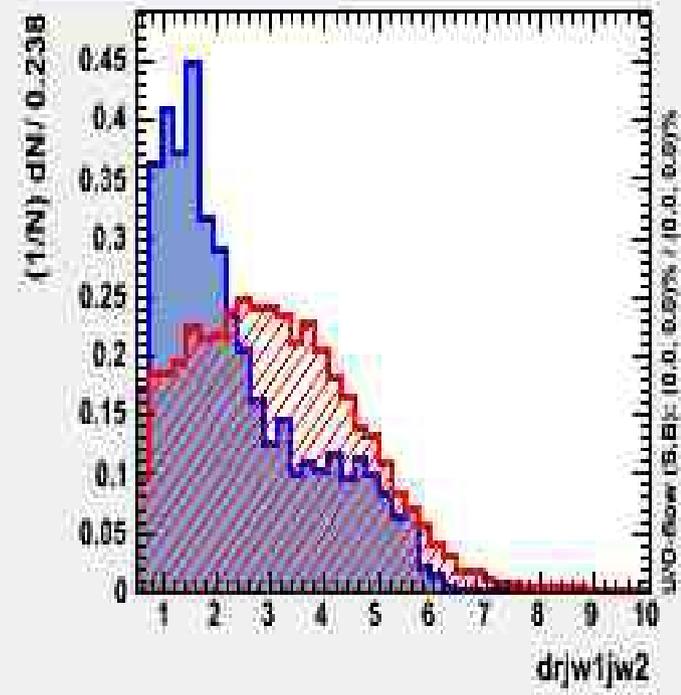
Input variable: drb2w2



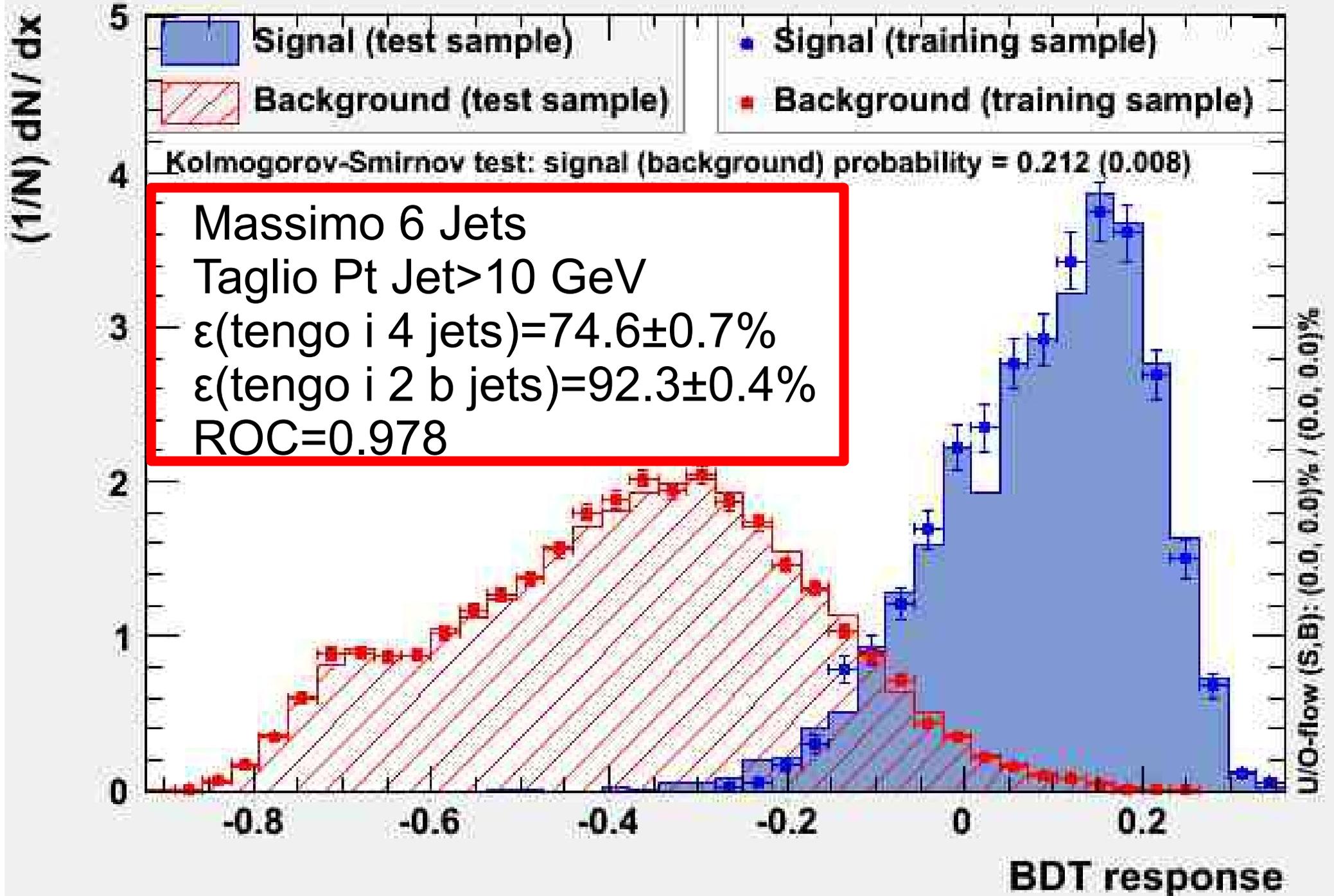
Input variable: drb1b2



Input variable: drjw1jw2



TMVA overtraining check for classifier: BDT



Massimo 6 Jets

Taglio Pt Jet > 10 GeV

$\epsilon(\text{tengo i 4 jets}) = 74.6 \pm 0.7\%$

$\epsilon(\text{tengo i 2 b jets}) = 92.3 \pm 0.4\%$

ROC = 0.978

Prendendo la combinazione di massima BDT ottengo:

Prob(Tutti i 4 jets corretti) = $38.2 \pm 0.7\%$

Prob(2 B jets giusti) = $54.3 \pm 0.8\%$

Prob(almeno 1 B jet giusto) = $75.1 \pm 0.7\%$

Massimo 10 Jets

Taglio Pt Jet > 20 GeV

$\epsilon(\text{tengo i 4 jets}) = 65.5 \pm 0.7\%$

$\epsilon(\text{tengo i 2 b jets}) = 90.1 \pm 0.5\%$

ROC = 0.983

Prendendo la combinazione di massima BDT ottengo:

Prob(Tutti i 4 jets corretti) = $35.8 \pm 0.7\%$

Prob(2 B jets giusti) = $49.9 \pm 0.8\%$

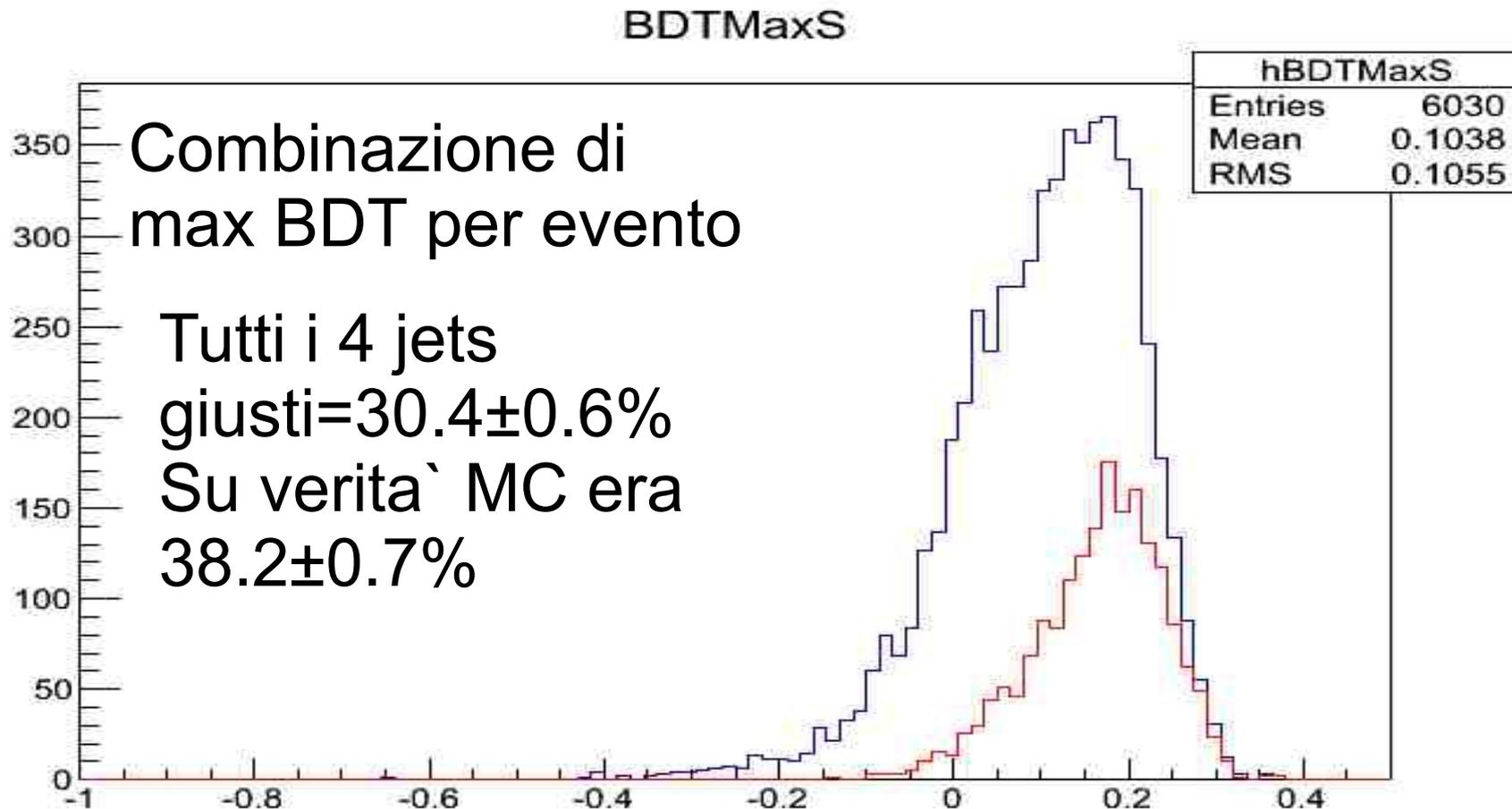
Prob(almeno 1 B jet giusto) = $69.4 \pm 0.7\%$

Applicazione a tutti gli eventi

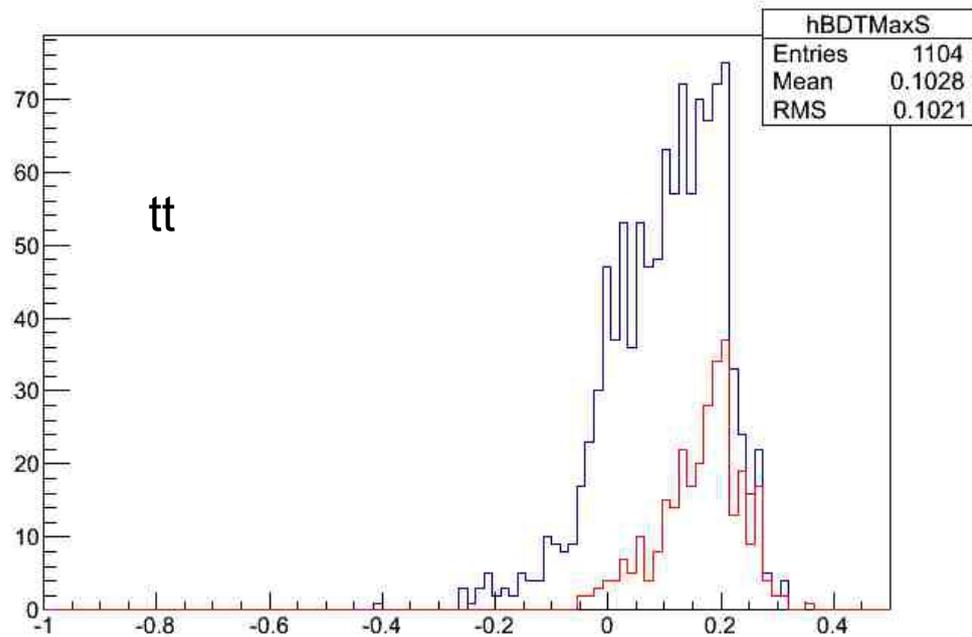
Metodo Rosso

Prendo come leptone da top quello selezionato con il metodo spiegato precedentemente.

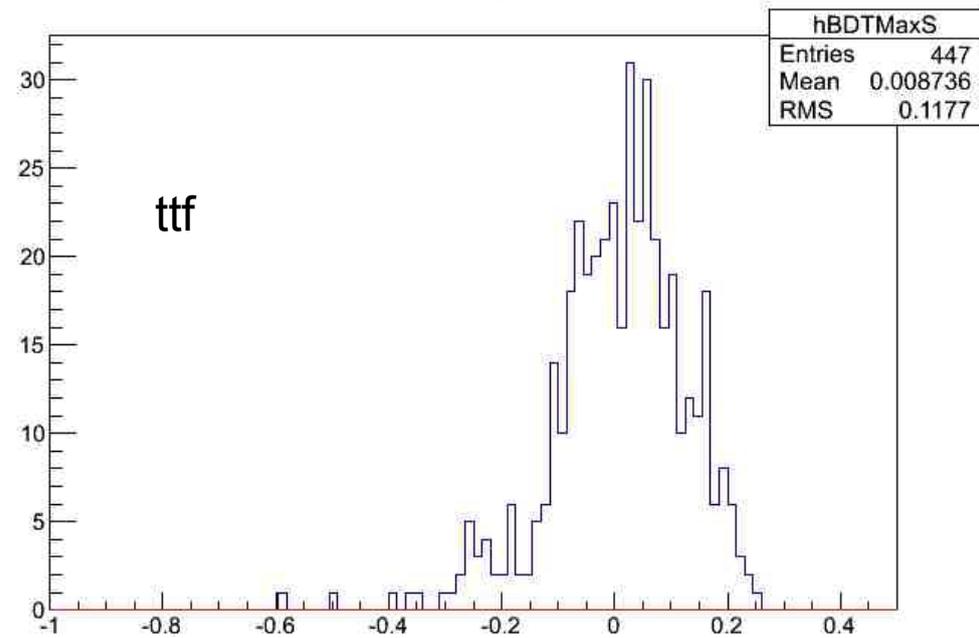
Uso grandezze ricostruite e tutti i campioni (segnale e fondi).



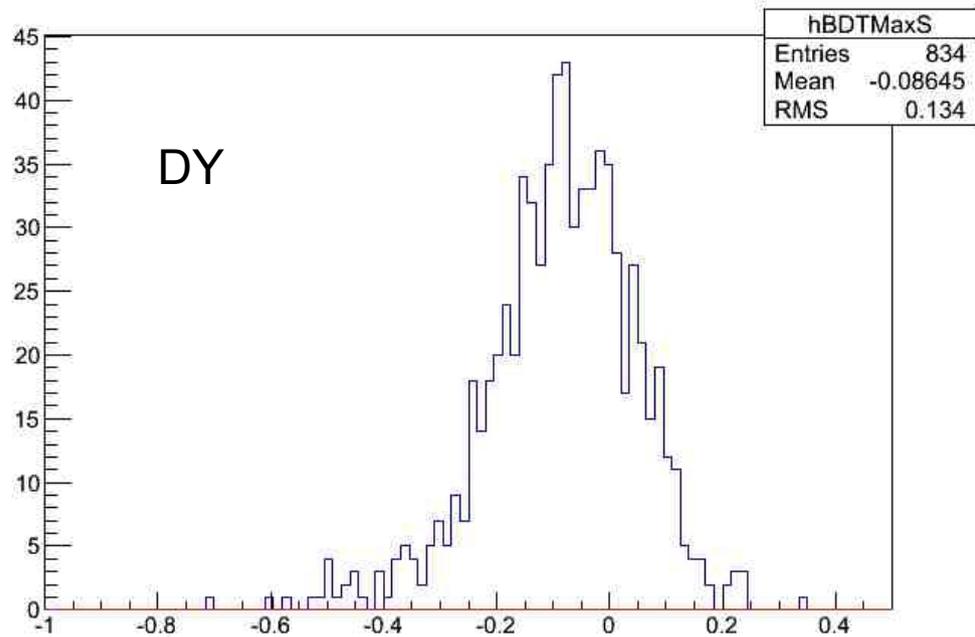
BDTMaxS



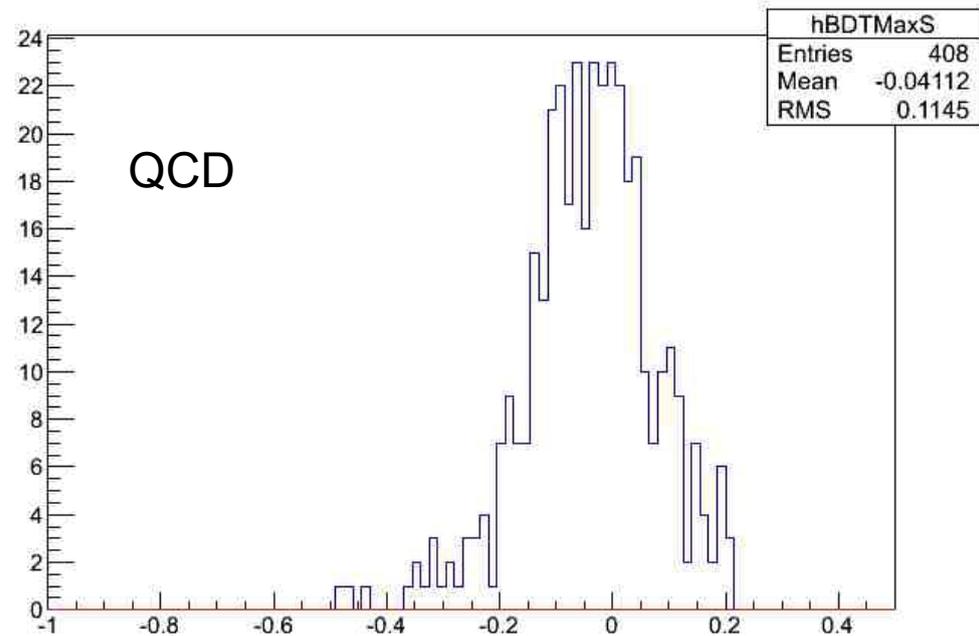
BDTMaxS



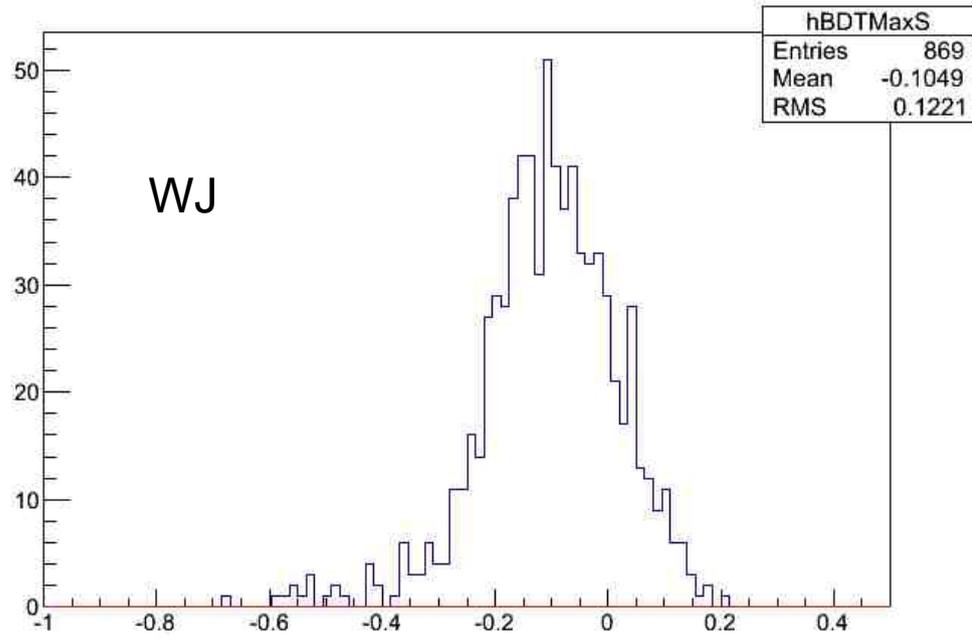
BDTMaxS



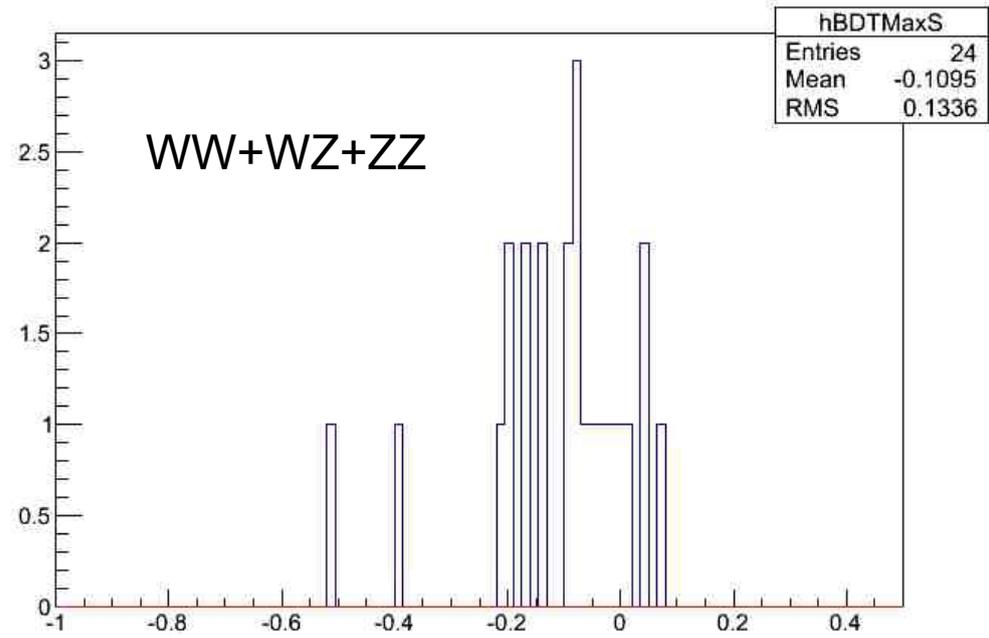
BDTMaxS



BDTMaxS



BDTMaxS



Ricostruzione evento

Ntupla iniziali preselezione ricostruzione

TtSL	1888	1723	1151	1141
TtFL	1830	1769	434	433
DY	179793	167859	859	835
QCD	360095	270353	459	408
Wjets	11947	4151	902	869
Altro	-	-	-	218

tt+tff = $40.3 \pm 0.8\%$

DY= $21.4 \pm 0.7\%$

QCD= $10.5 \pm 0.5\%$

Wjets= $22.3 \pm 0.7\%$

Altro= $5.6 \pm 0.4\%$

Per il metodo di reiezione del fondo
saltare a pagina 92

Ricostruzione evento (BDT>-0.1)

Normalizzati a QCD

Iniziali precedenti taglio

TtSL	1830	1110	1057
TtFL	1883	448	365
DY	179793	859	426
QCD	360095	408	276
WW+WZ+ZZ	619	24	14
Wjets	11947	869	376

tt+tfl = 56%

DY=17%

QCD=11%

WW+WZ+ZZ=0.6%

Wjets=15%

Assegnazione del Top padre per il leptone da B da verità MC

Come leptoni da B prendo solo i muoni.

Il top padre del muone da B si può ottenere dalla verità MC risalendo dal muone o risalendo dal partone che ha originato il jet a cui il muone appartiene.

I risultati differiscono nel $6.7 \pm 0.4\%$ dei casi.

Assegnazione del Top padre da ricostruzione evento

Dopo la ricostruzione dell'evento, ordino le 4-plette in ordine decrescente di BDT.

Per ogni muone da B, vado a vedere quale e` la prima 4-pletta in cui il suo jet e` stato classificato come jet da B.

Confronto il vero top padre di quel muone (o del suo jet, che sono a volte diversi come detto prima) con il top a cui lo stesso jet e` stato associato dalla ricostruzione dell'evento.

Probabilità di giusta associazione

Top da verità MC partendo dal muone

Jet del muone assegnato al top SL = $72.1 \pm 0.9\%$

Jet del muone assegnato al top H = $73.5 \pm 0.9\%$

Media = $72.7 \pm 0.6\%$

Top da verità MC partendo dal jet

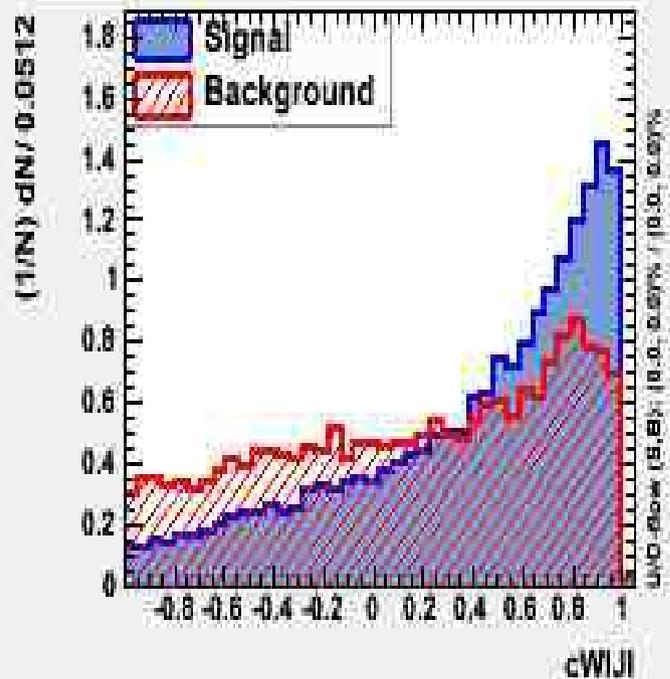
Jet del muone assegnato al top SL = $74.2 \pm 0.9\%$

Jet del muone assegnato al top H = $77.4 \pm 0.9\%$

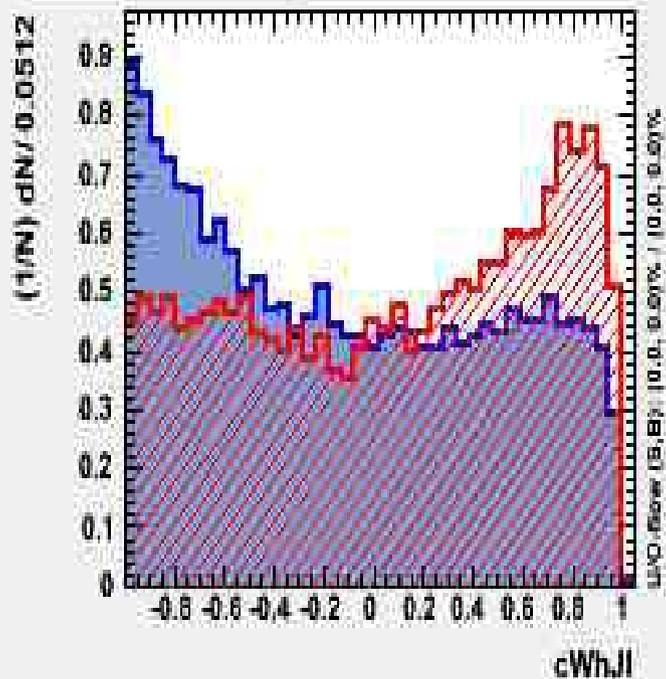
Media = $75.7 \pm 0.6\%$

Separo i muoni assegnati al top giusto e sbagliato
Attribuzione al top SL

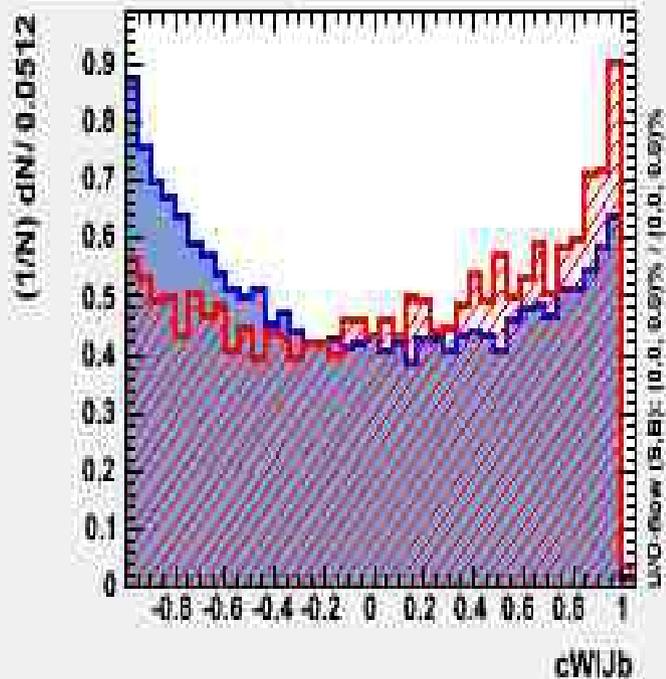
Input variable: cWlJl



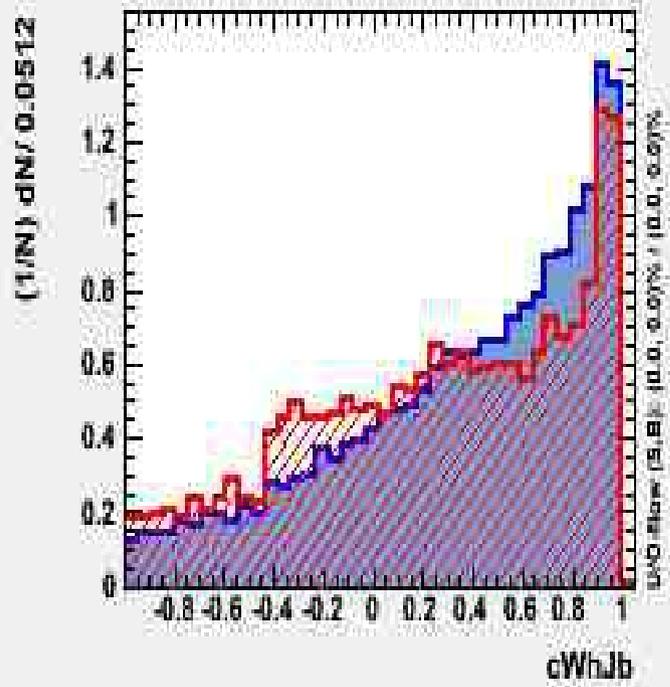
Input variable: cWhJl



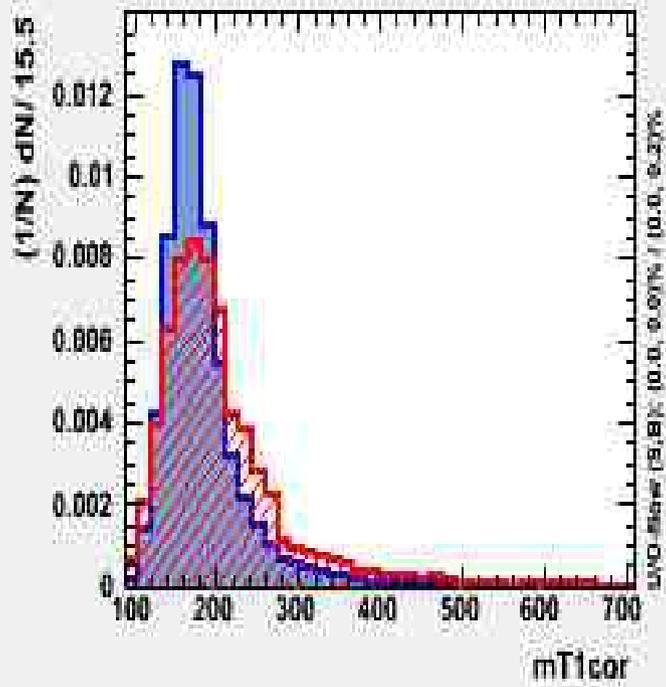
Input variable: cWlJb



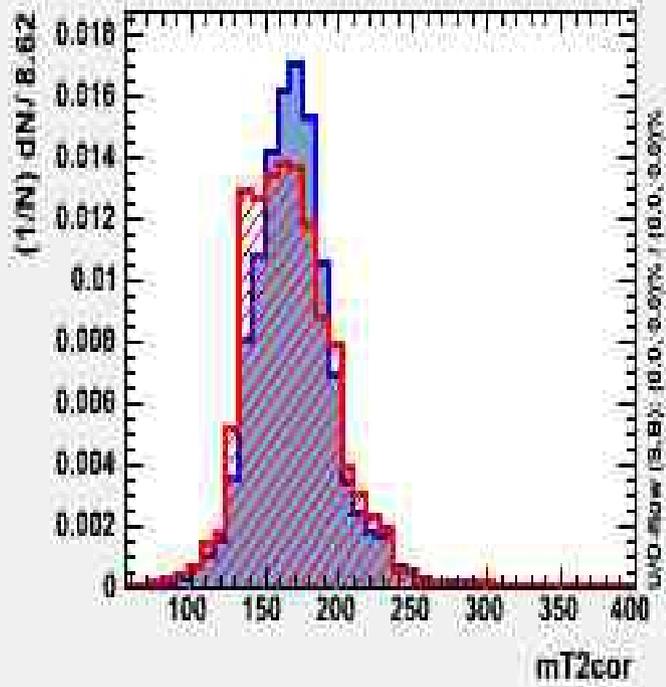
Input variable: cWhJb



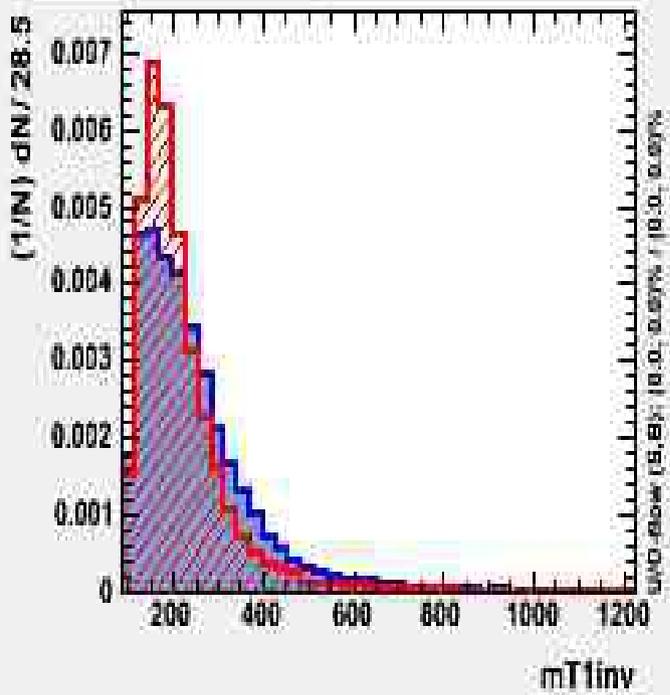
Input variable: mT1cor



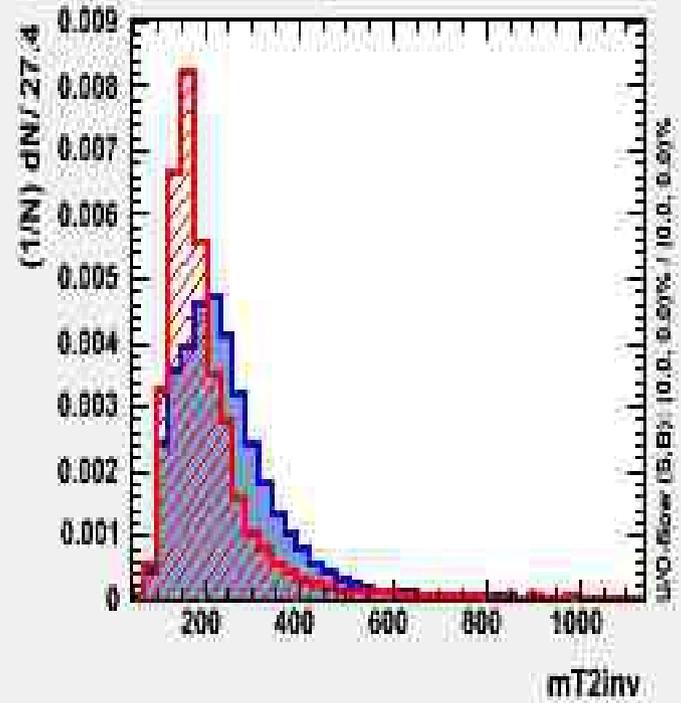
Input variable: mT2cor



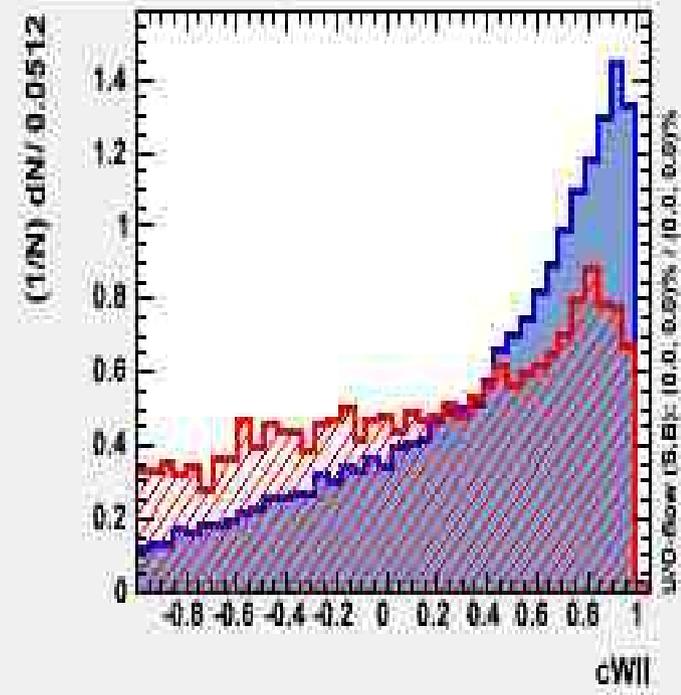
Input variable: mT1inv



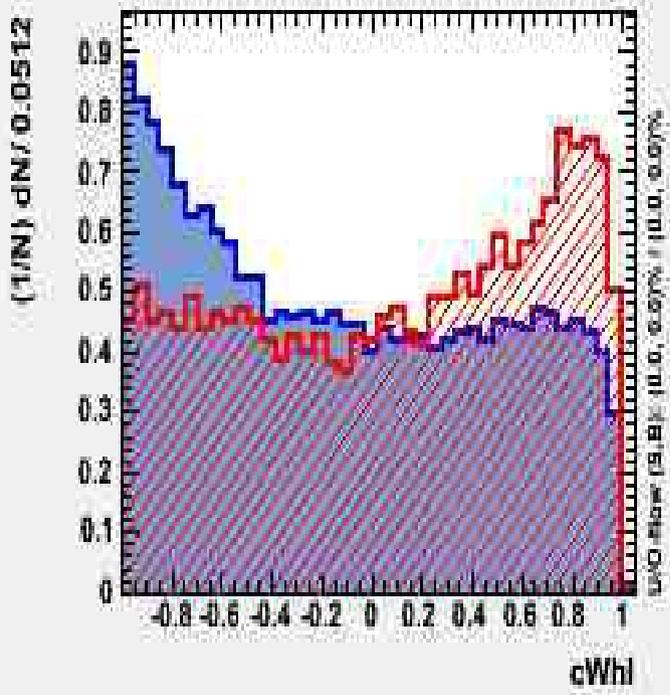
Input variable: mT2inv



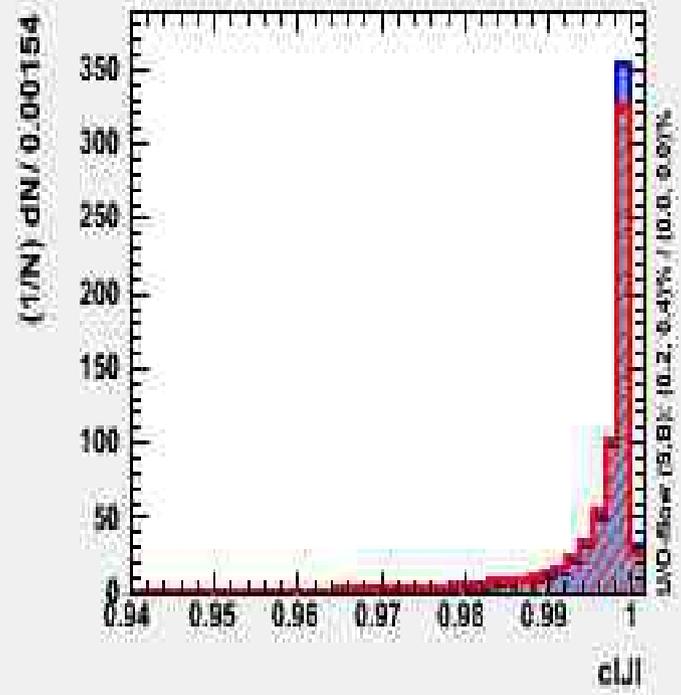
Input variable: cWll



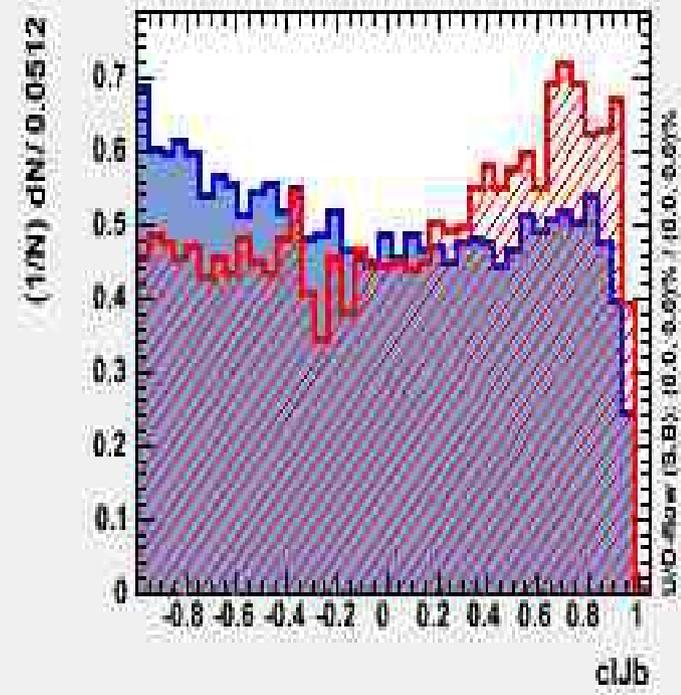
Input variable: cWhl



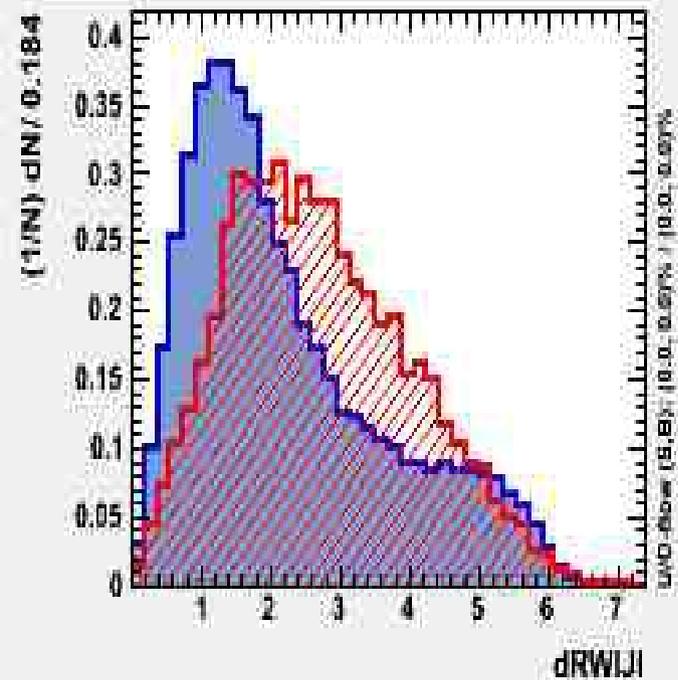
Input variable: cJl



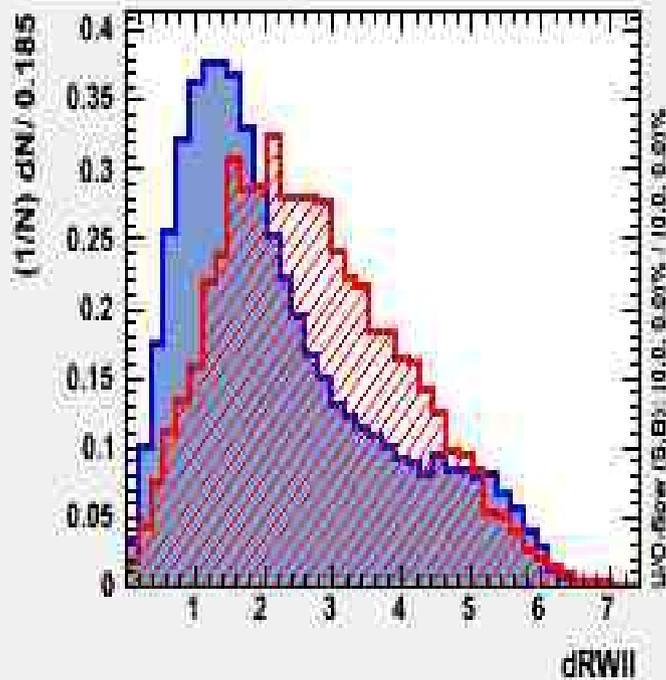
Input variable: cJb



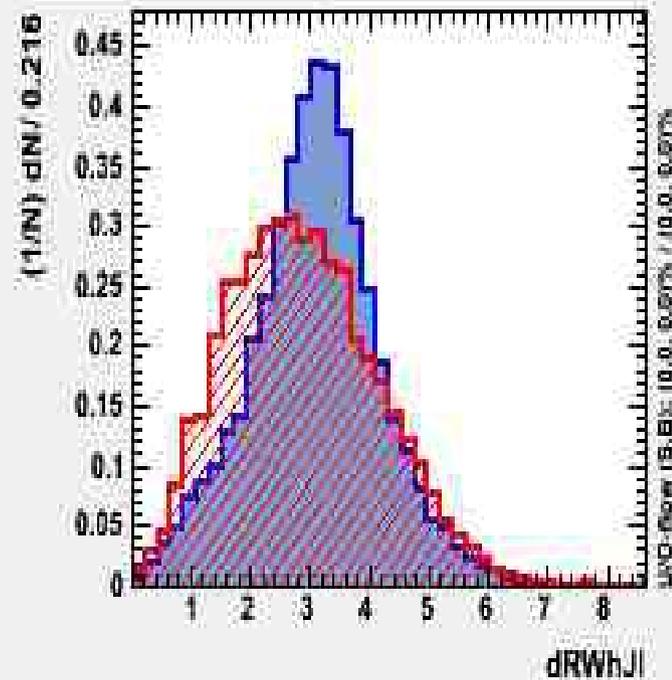
Input variable: dRWIj



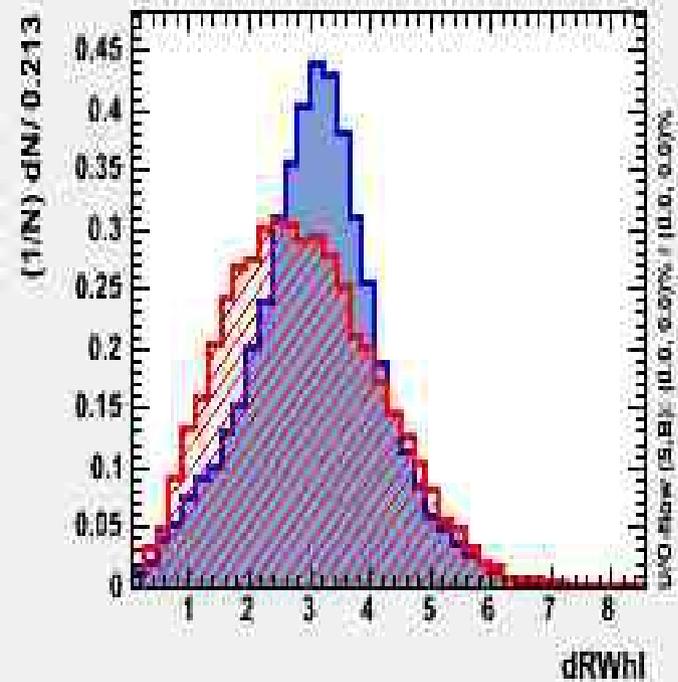
Input variable: dRWI



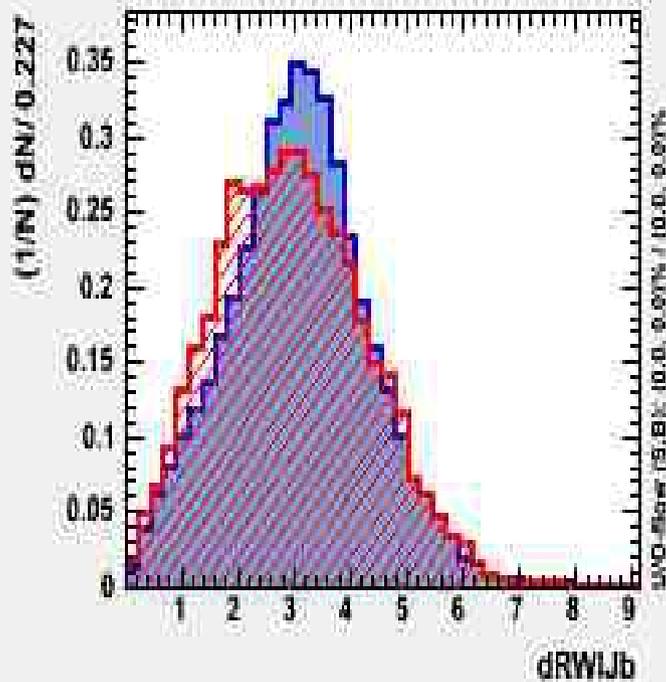
Input variable: dRWWhJ



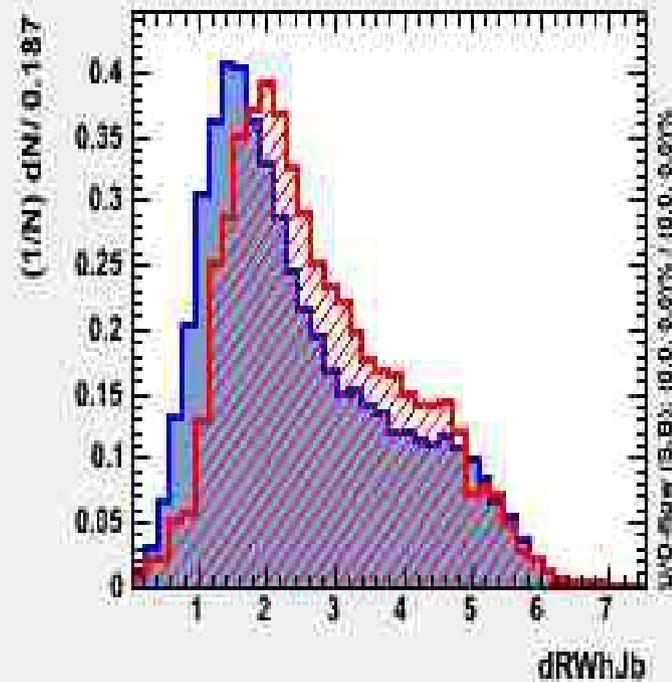
Input variable: dRWWh



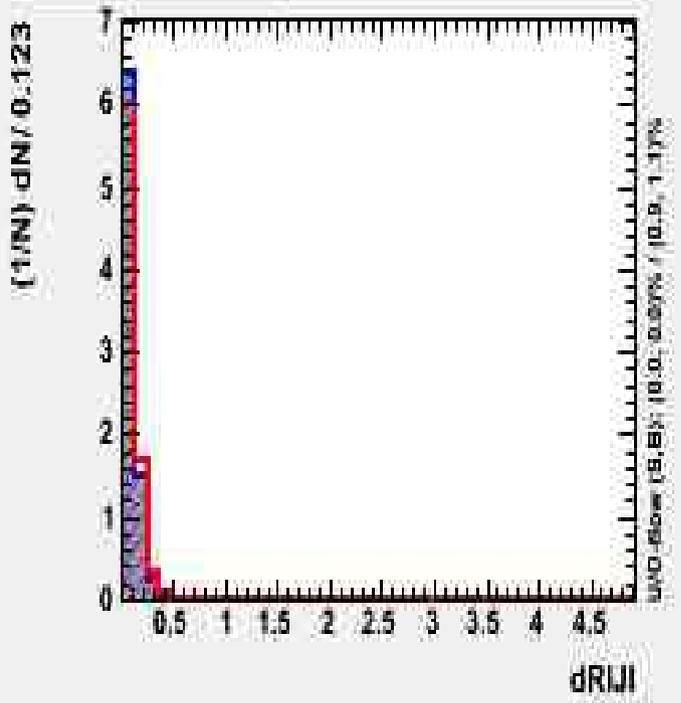
Input variable: dRWLjb



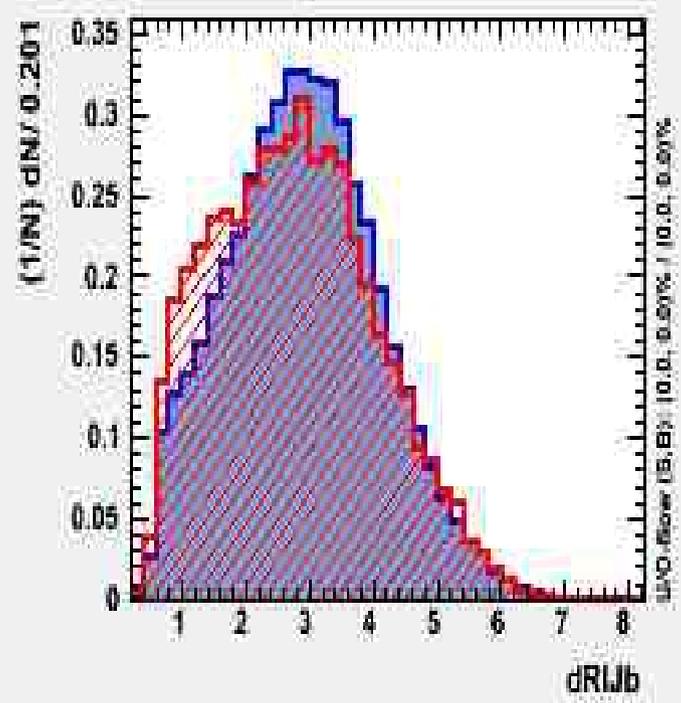
Input variable: dRWWhjb



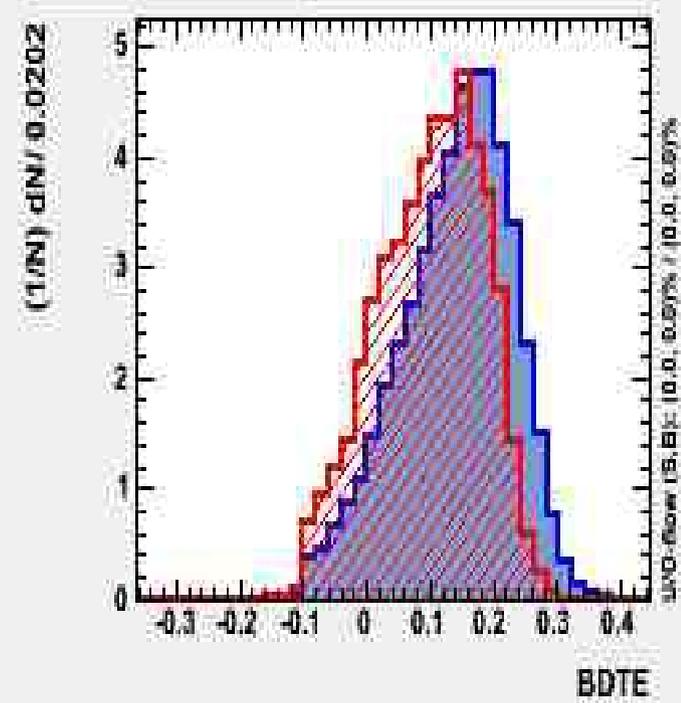
Input variable: dRII



Input variable: dRIIb

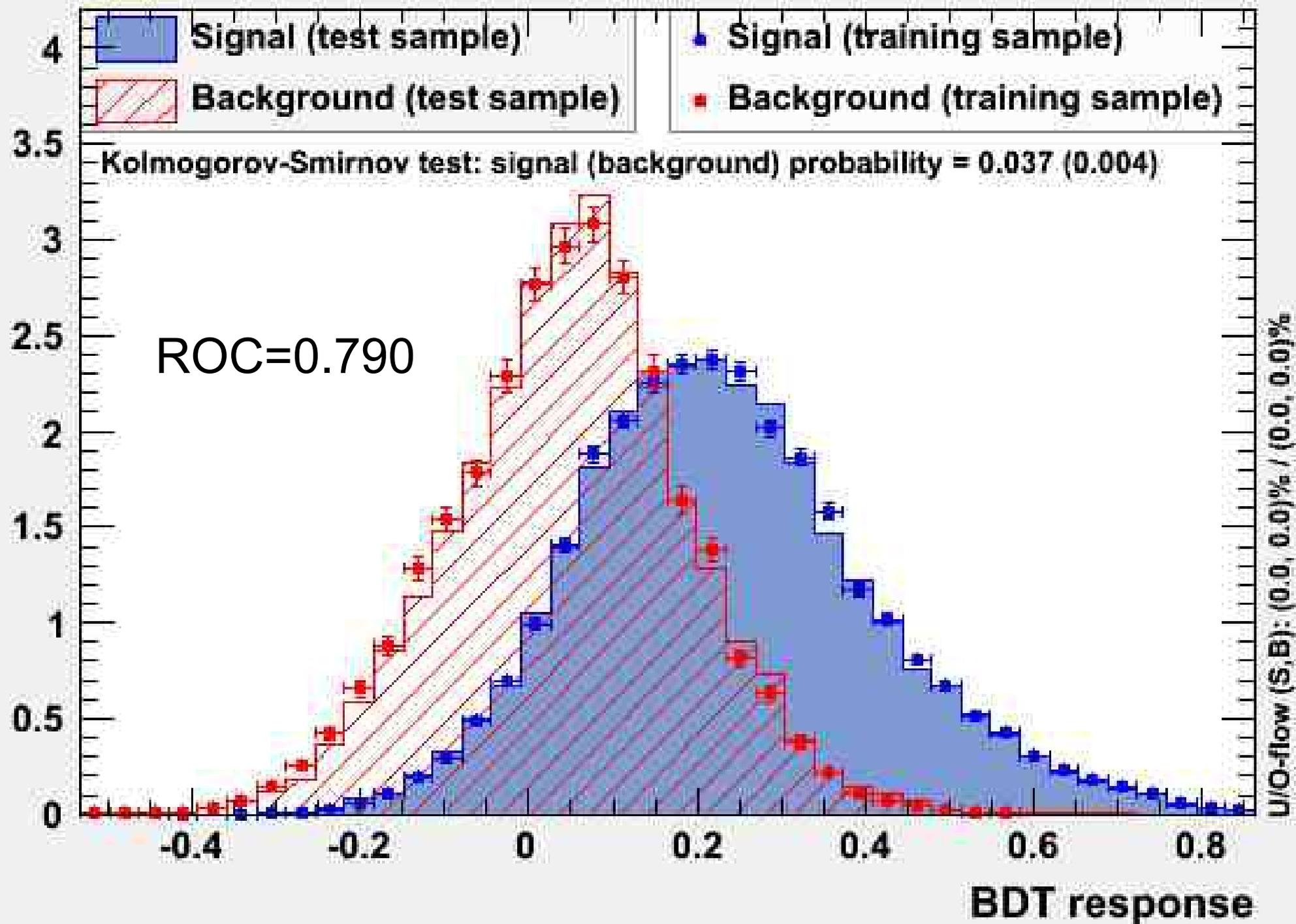


Input variable: BDTE



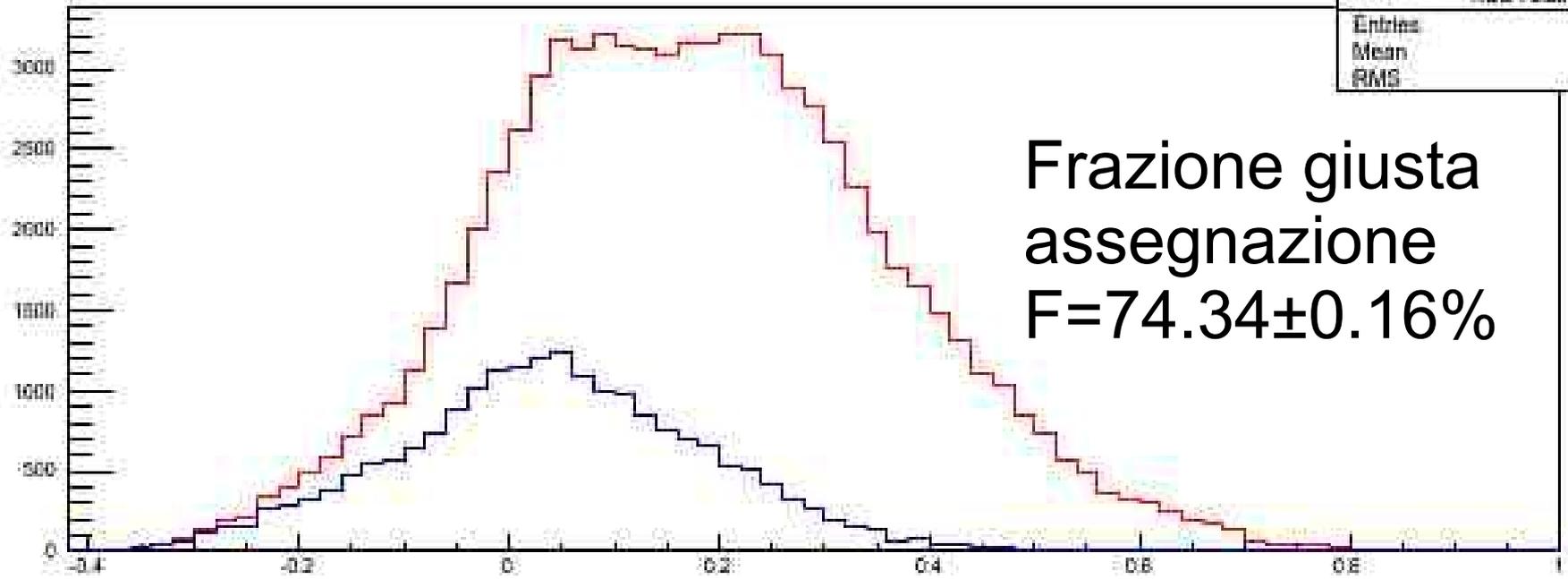
TMVA overtraining check for classifier: BDT

$(1/N) dN/dx$



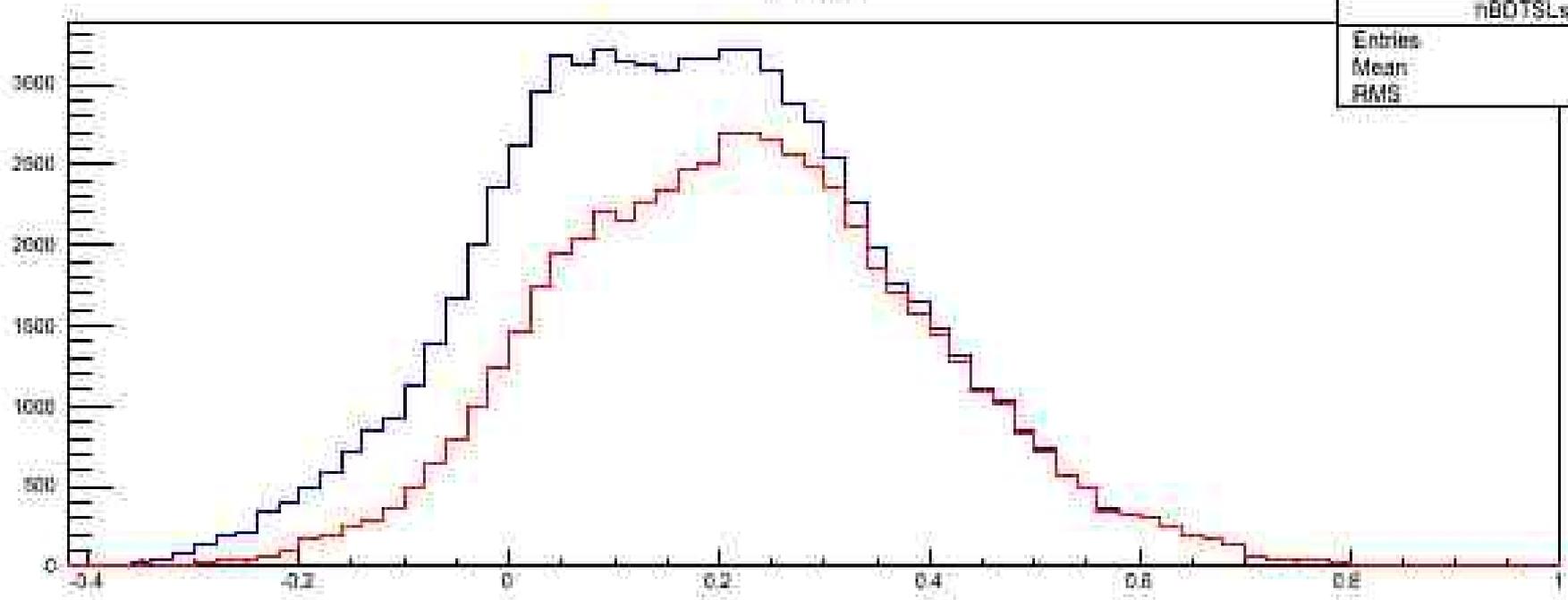
BDTSLb

nBDTSLb	
Entries	79271
Mean	0.176
RMS	0.1871



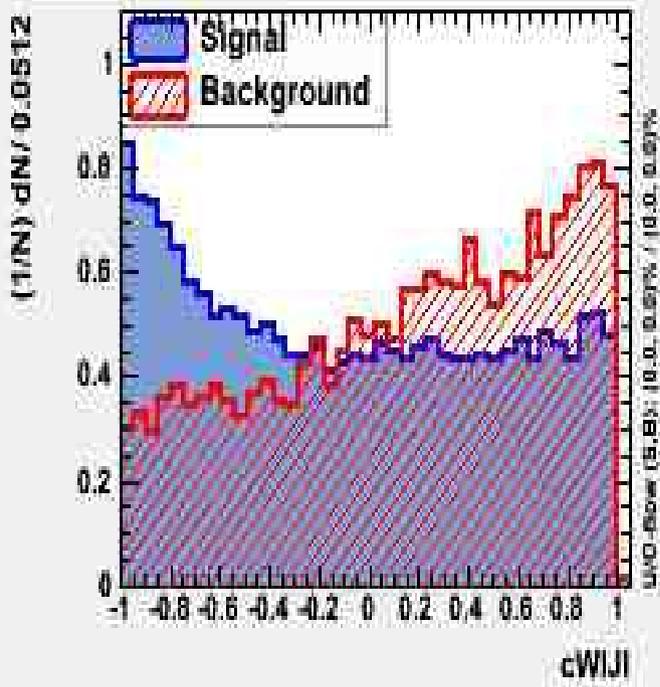
BDTSLs

nBDTSLs	
Entries	79271
Mean	0.176
RMS	0.1871

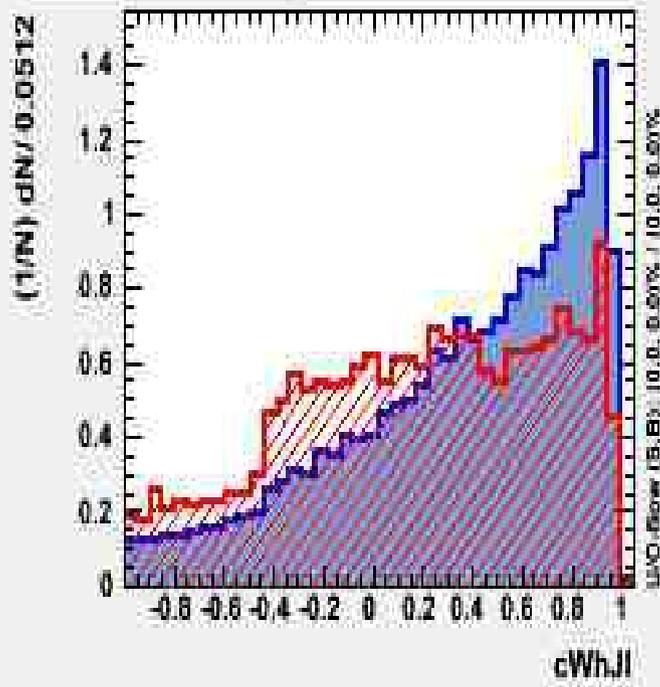


Separo i muoni assegnati al top giusto e sbagliato
Attribuzione al top H

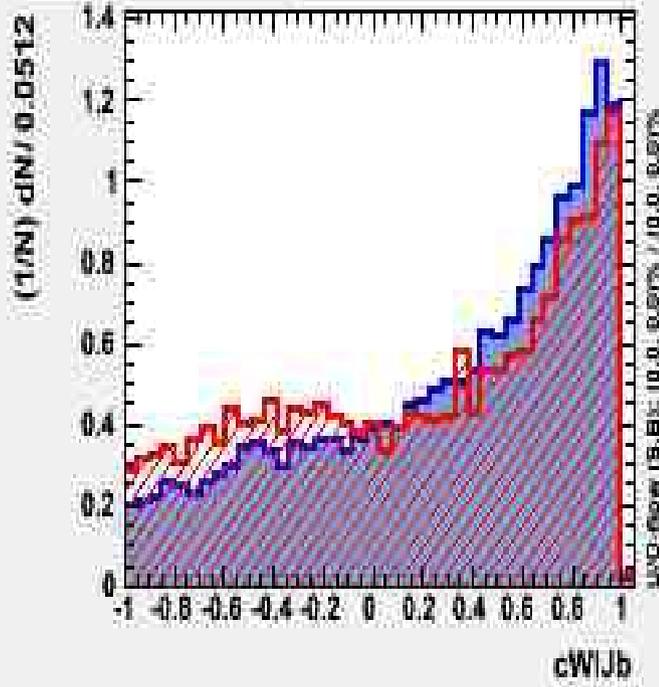
Input variable: cWJl



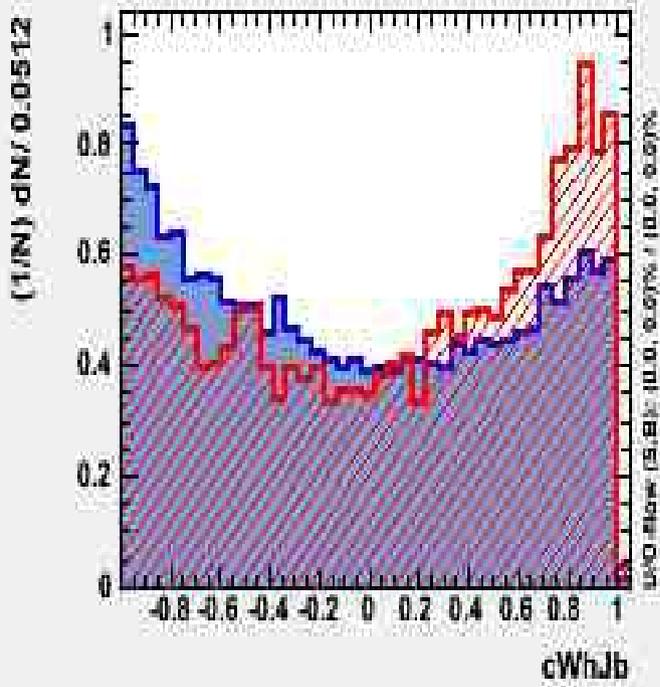
Input variable: cWhJl



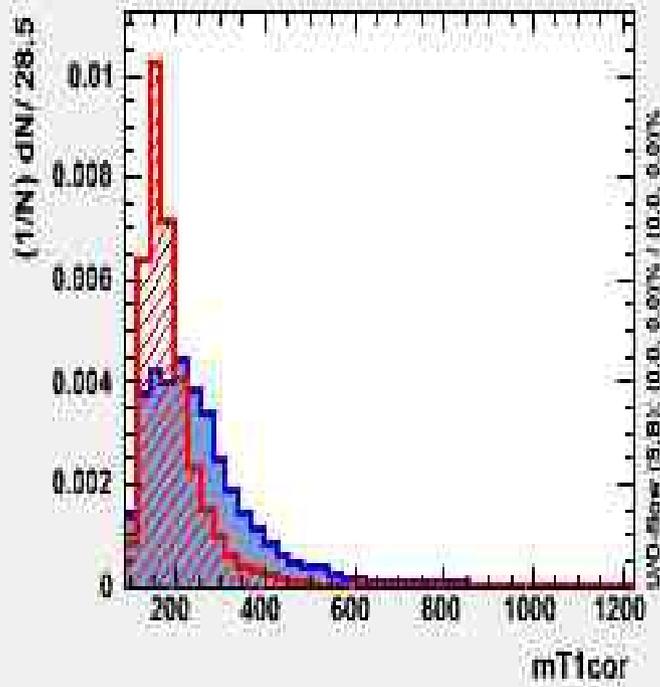
Input variable: cWJb



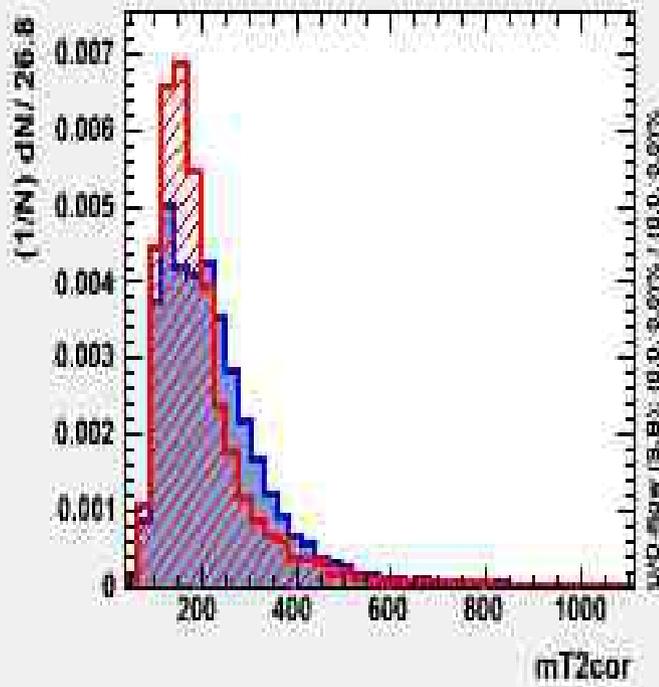
Input variable: cWhJb



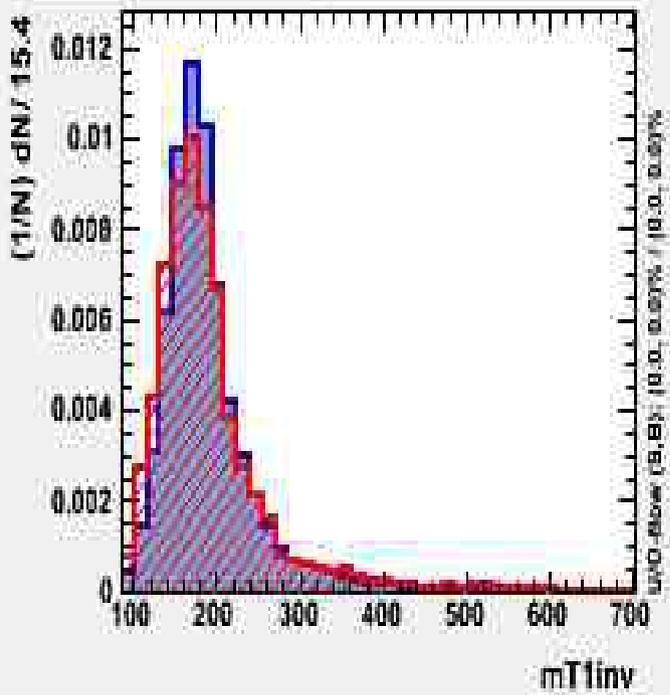
Input variable: mT1cor



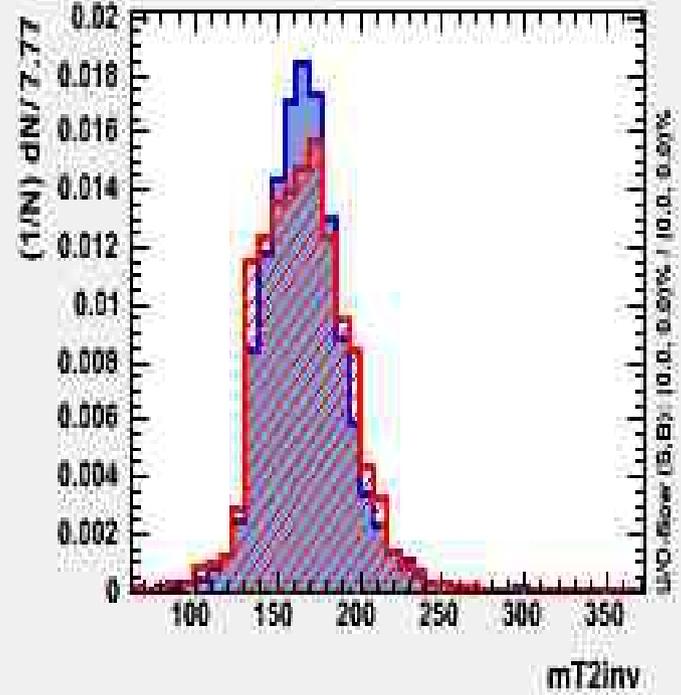
Input variable: mT2cor



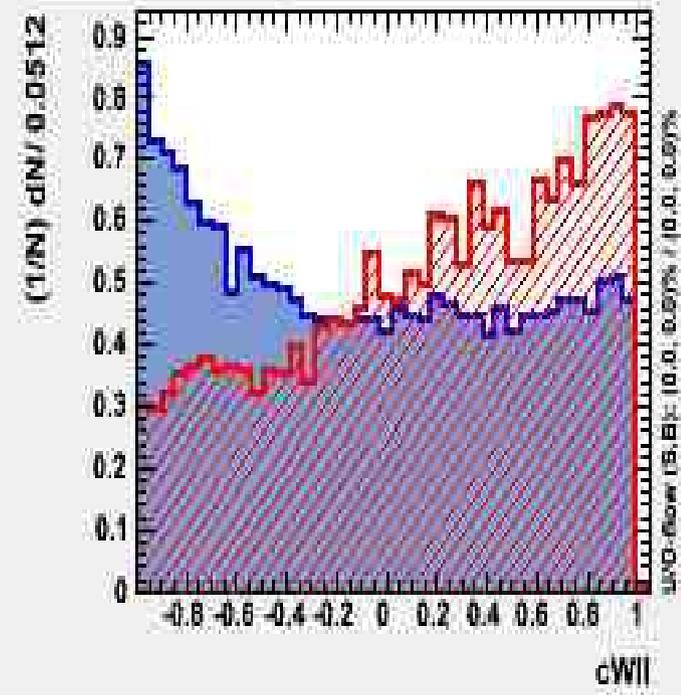
Input variable: mT1inv



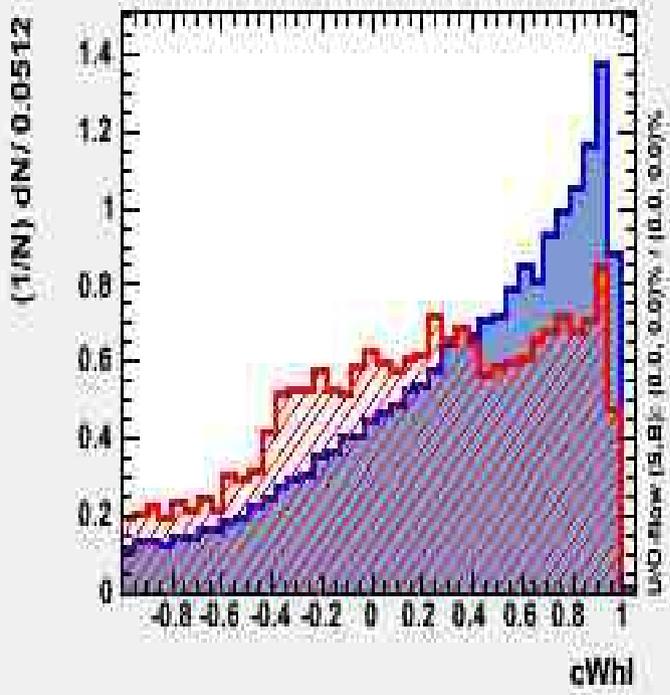
Input variable: mT2inv



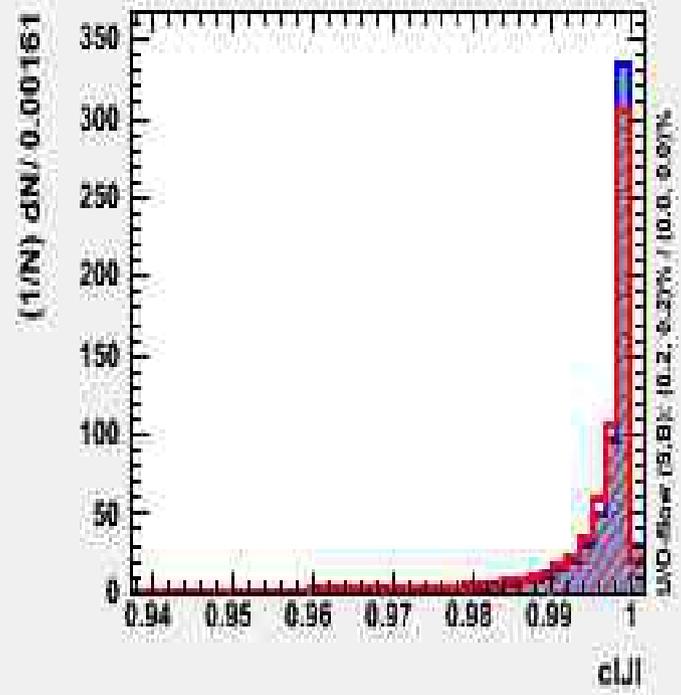
Input variable: cWll



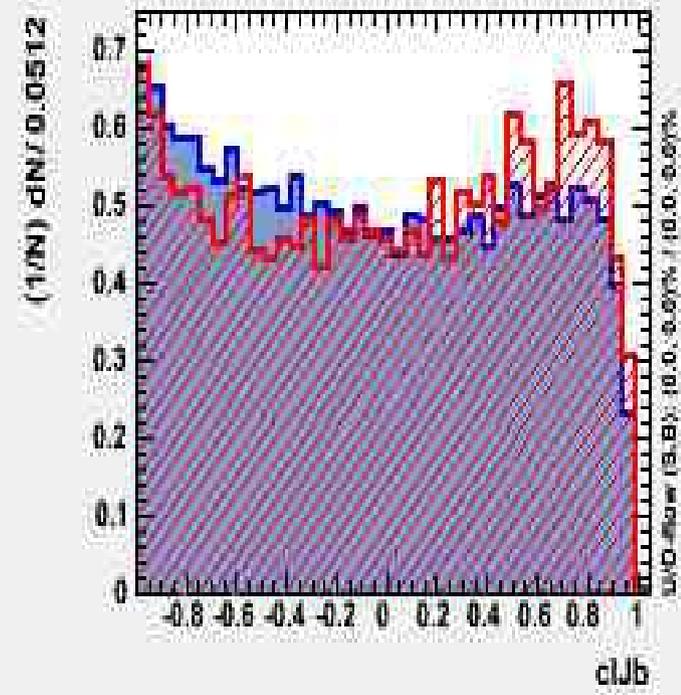
Input variable: cWhl



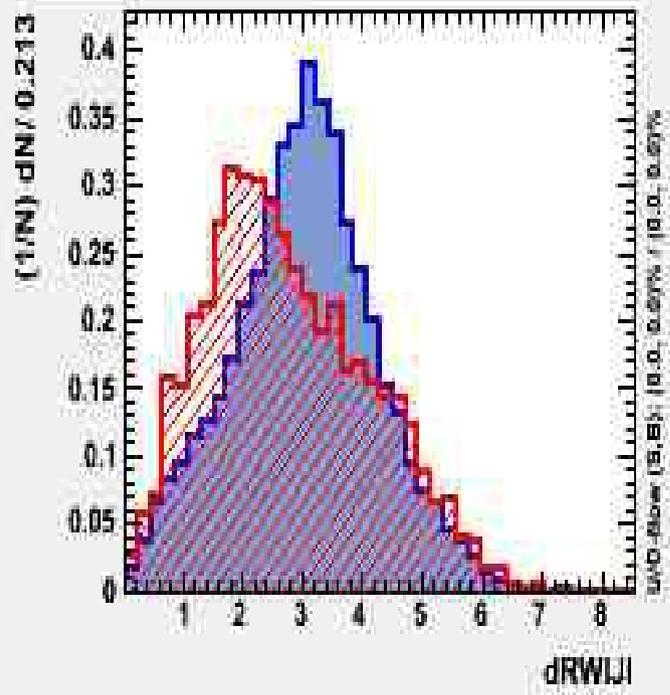
Input variable: cJl



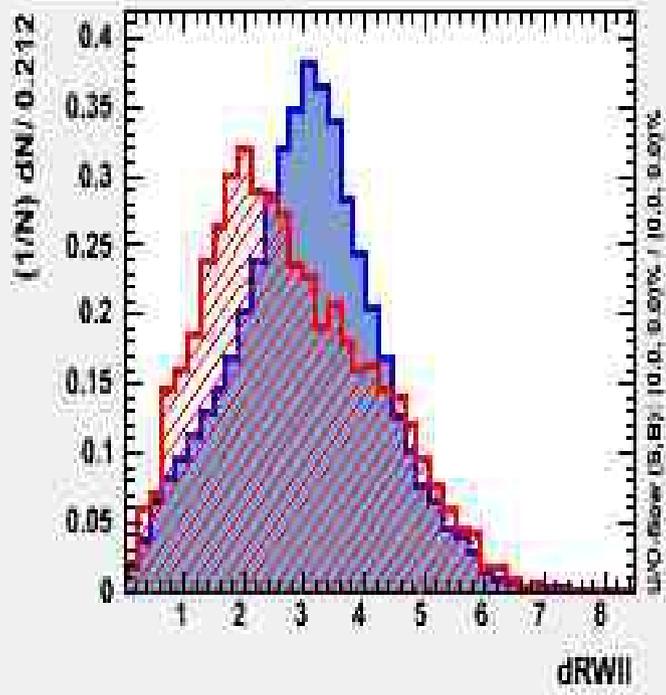
Input variable: cJlb



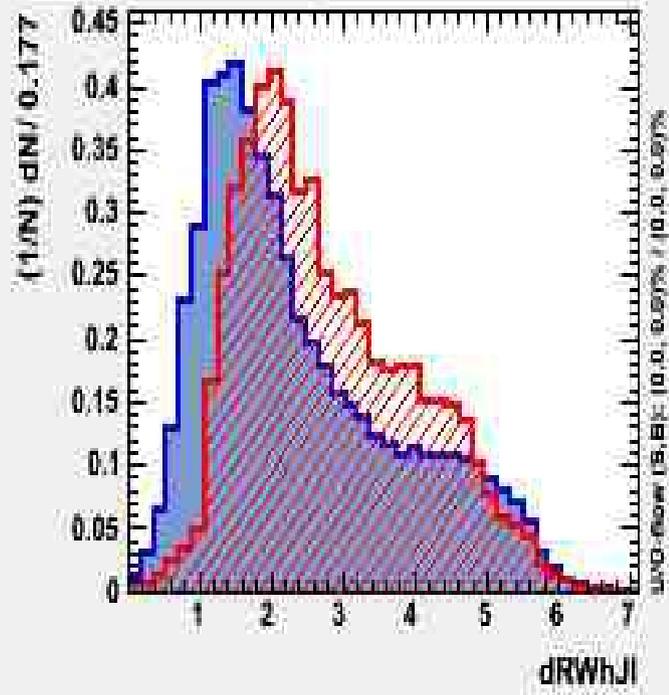
Input variable: dRWIi



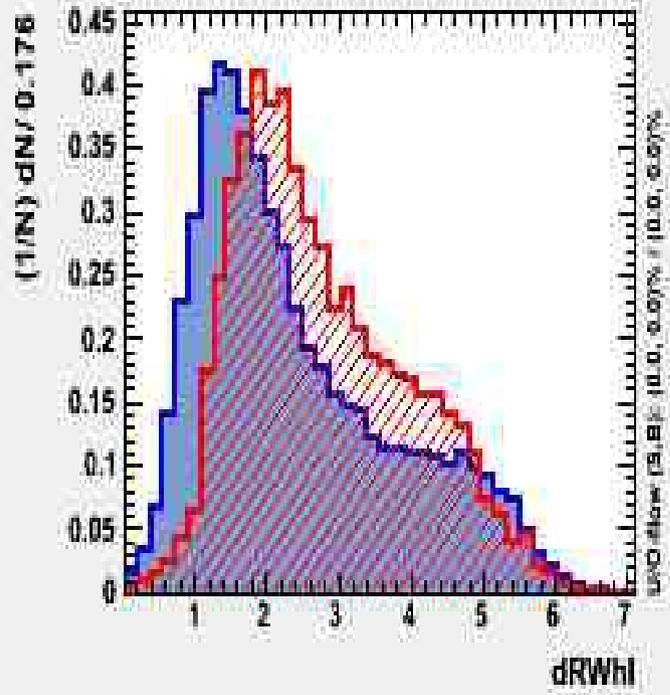
Input variable: dRWI



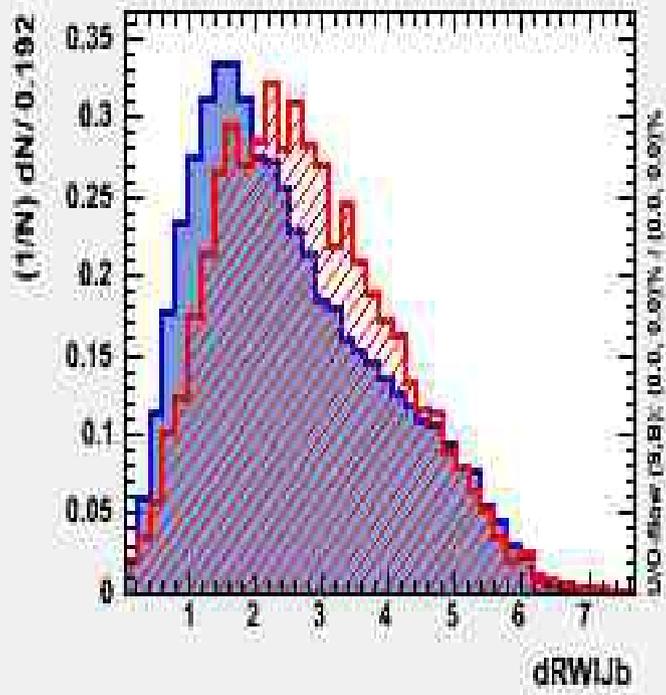
Input variable: dRWHi



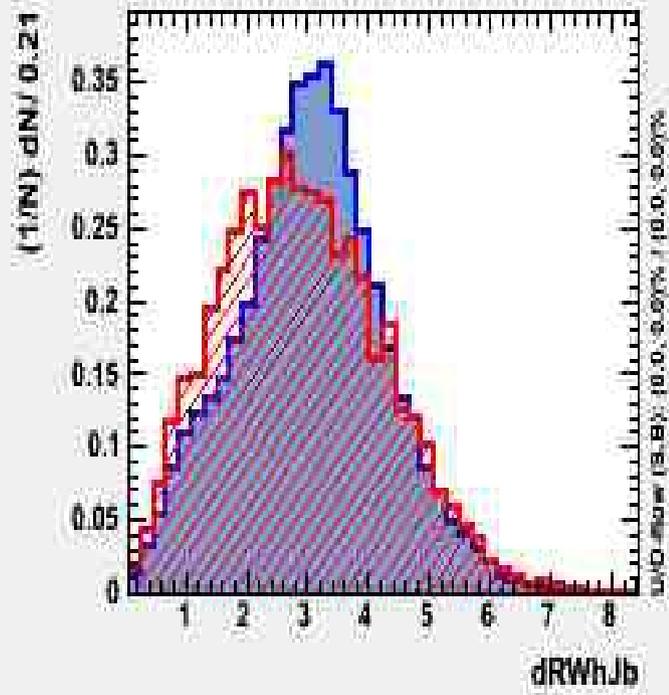
Input variable: dRWHi



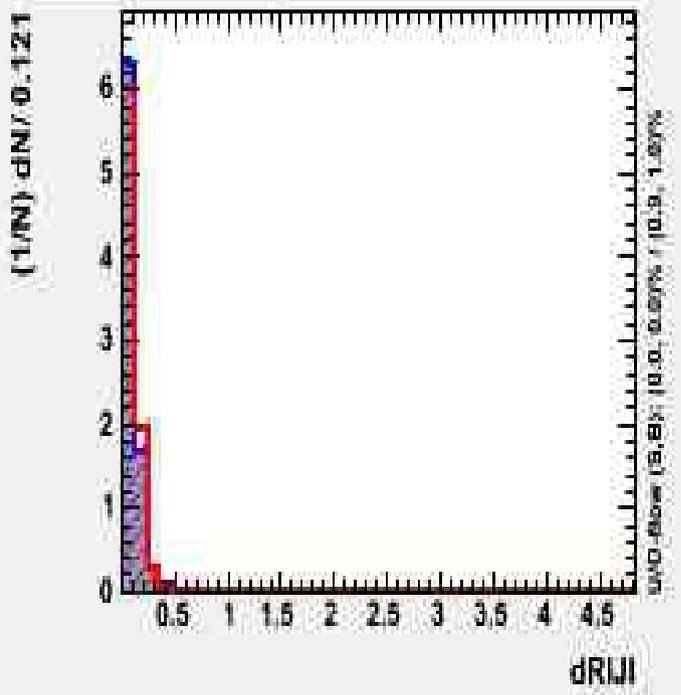
Input variable: dRWIjb



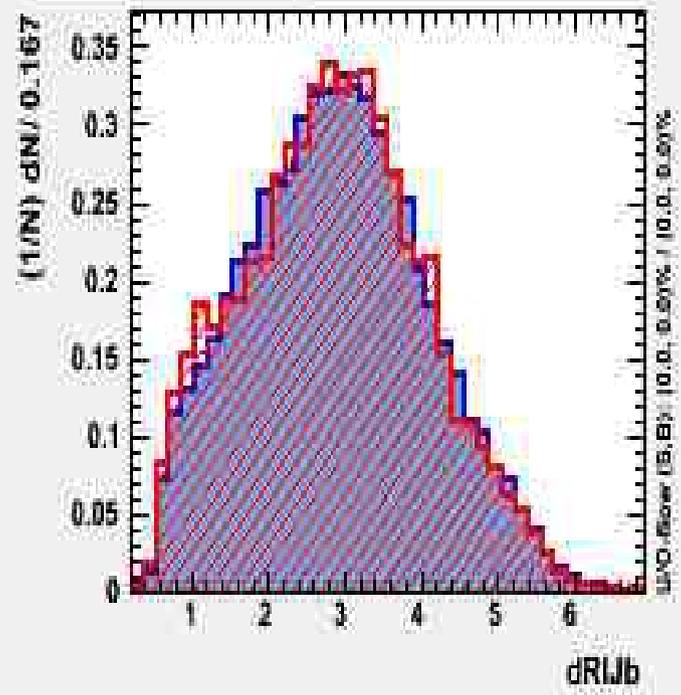
Input variable: dRWHjb



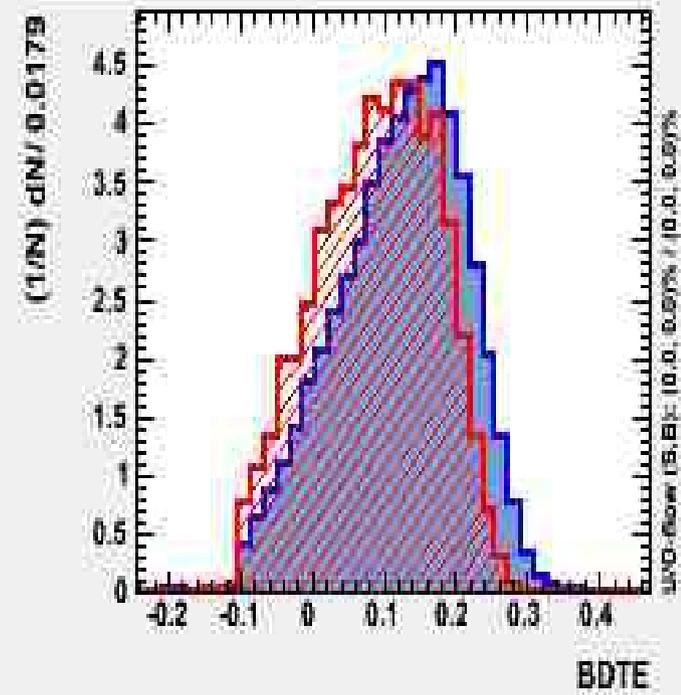
Input variable: dRII



Input variable: dRIIb

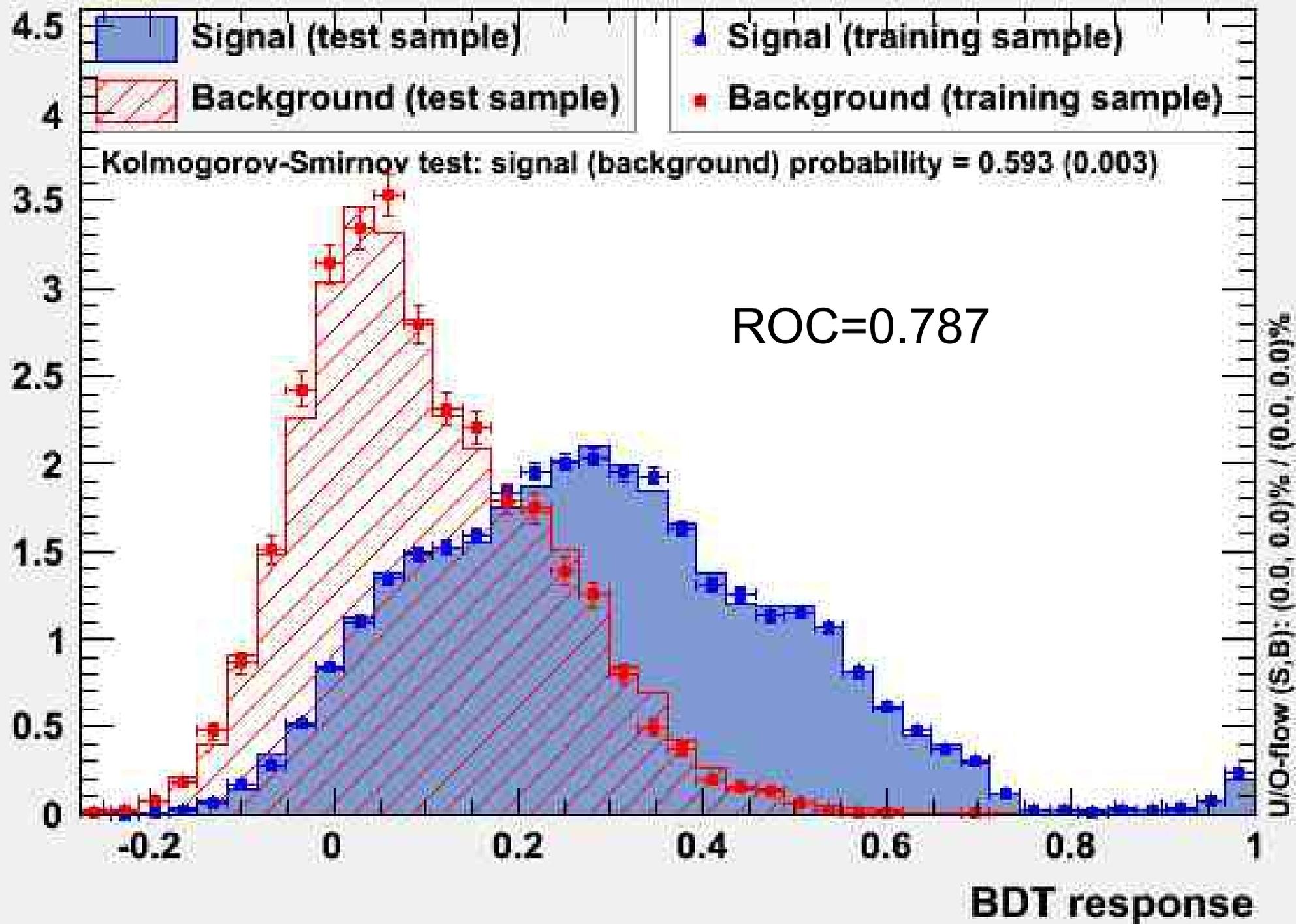


Input variable: BDTE

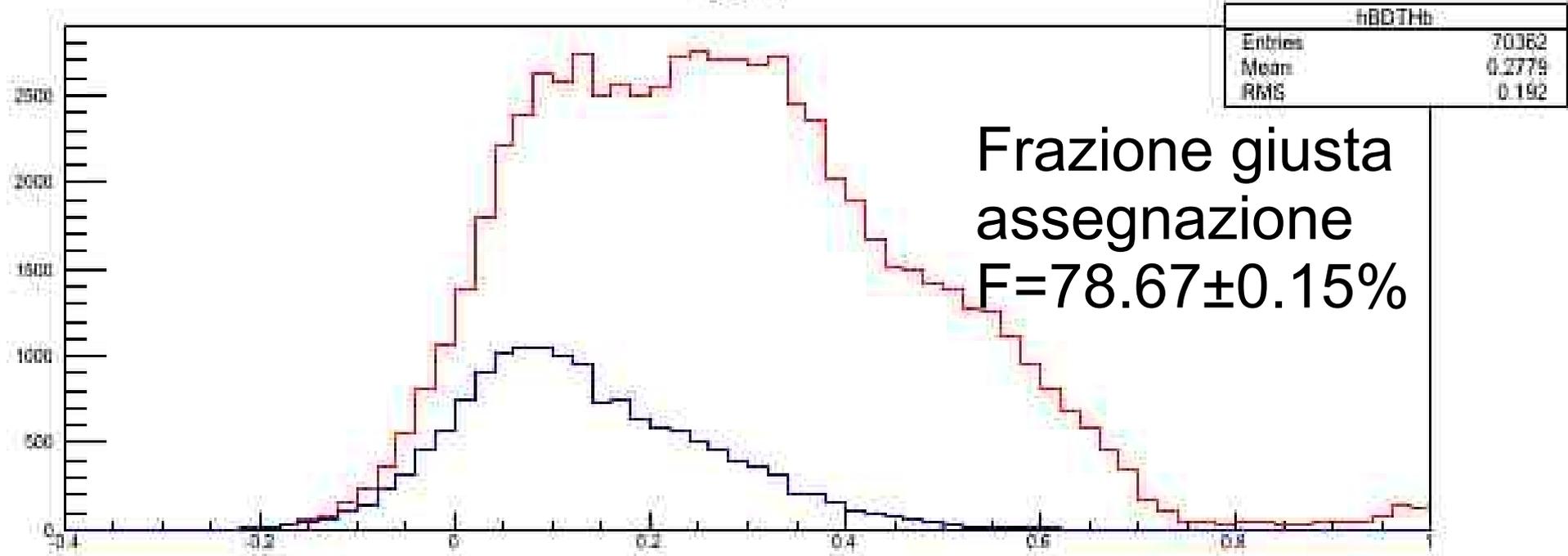


TMVA overtraining check for classifier: BDT

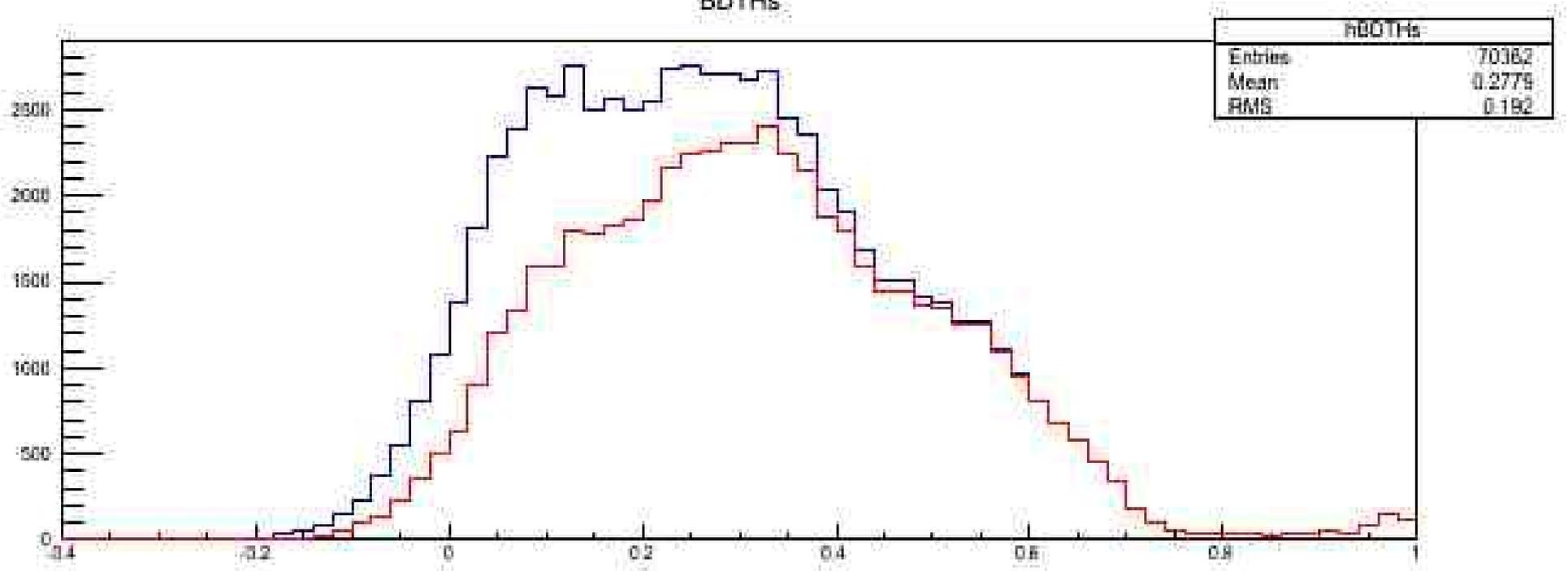
$(1/N) dN/dx$



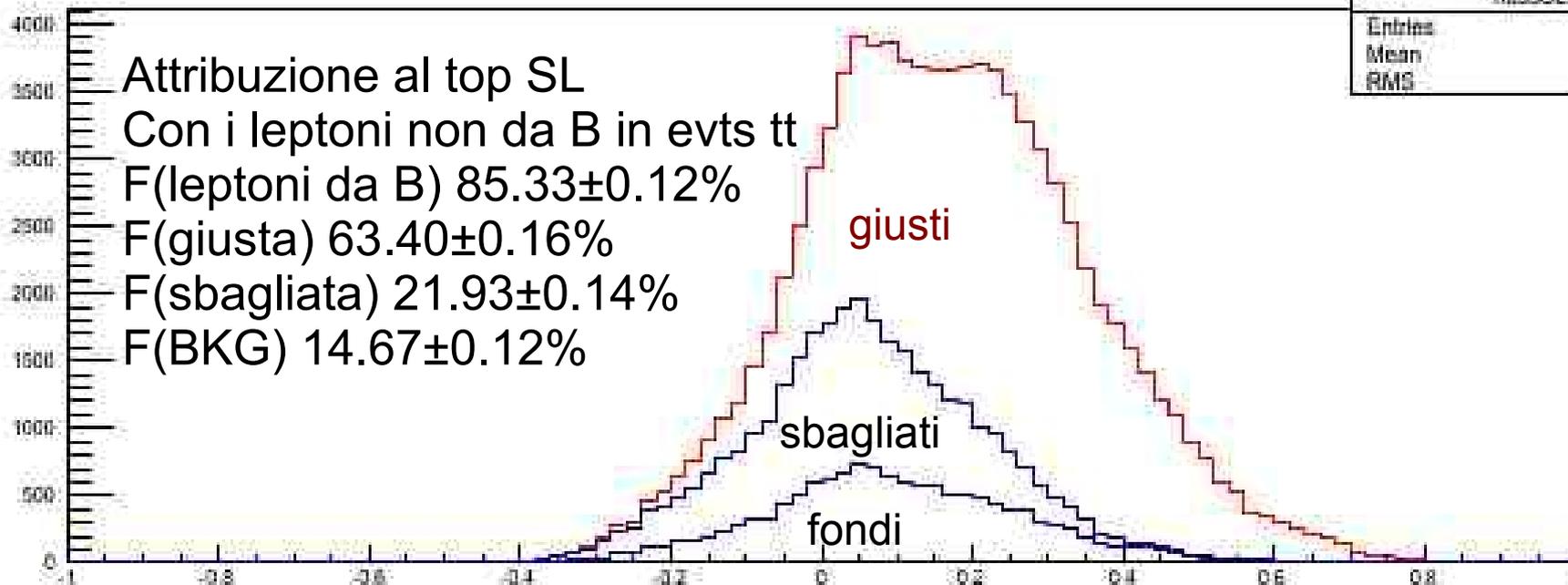
BOTHb



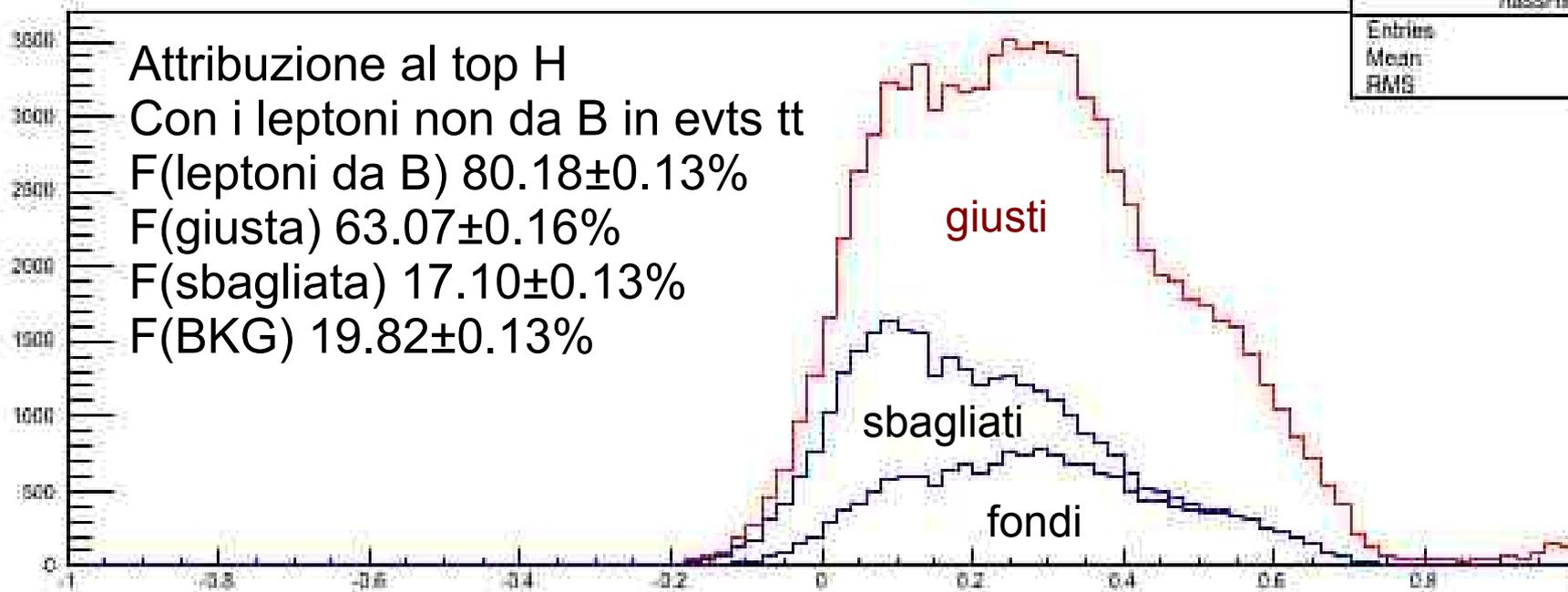
BOTHs



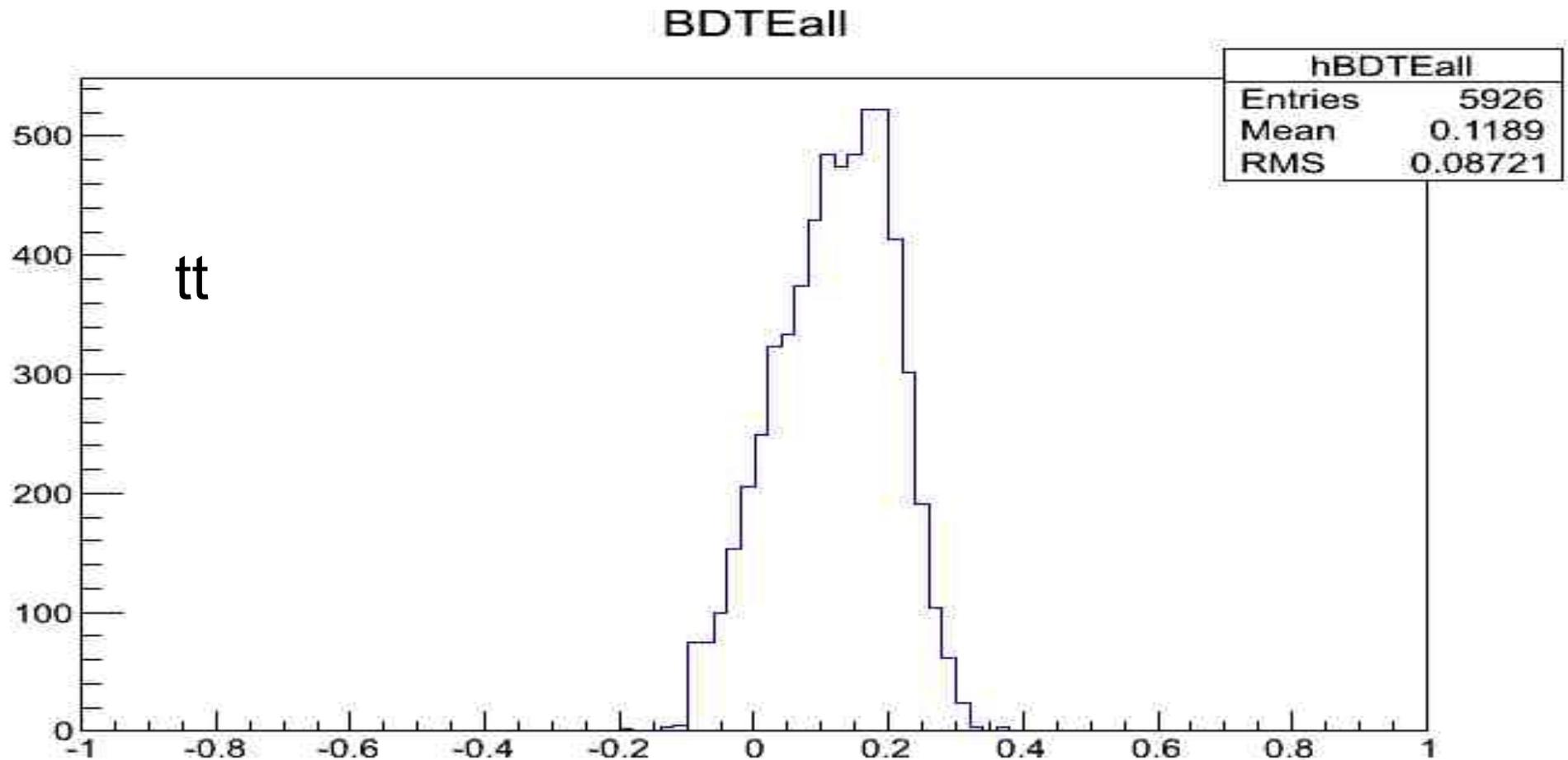
assSLs



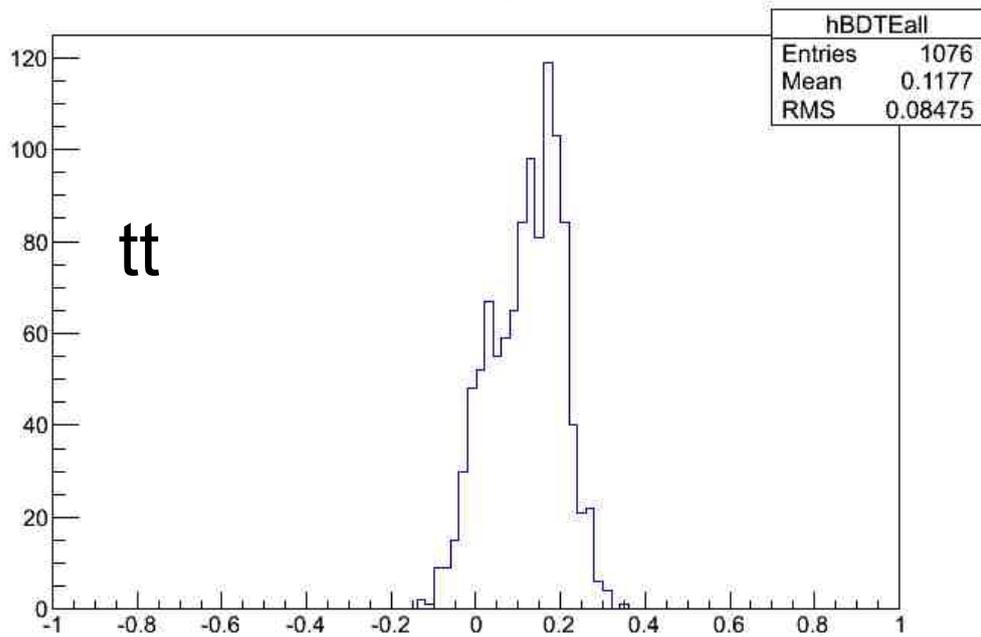
assHs



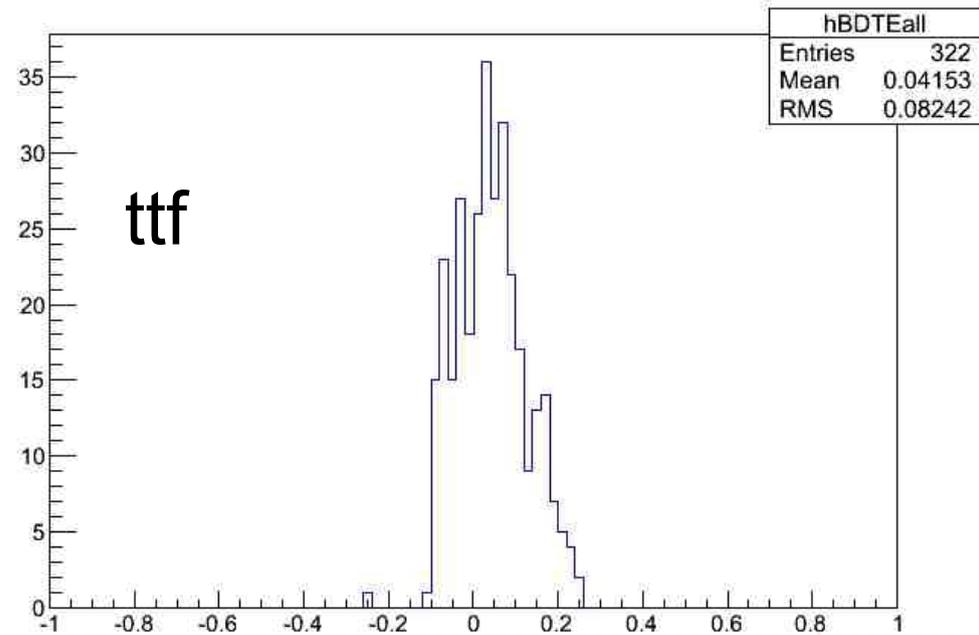
BDT (ricostruzione evento) della 4-pletta migliore in cui il muone e' stato assegnato a un jet da B per i vari samples



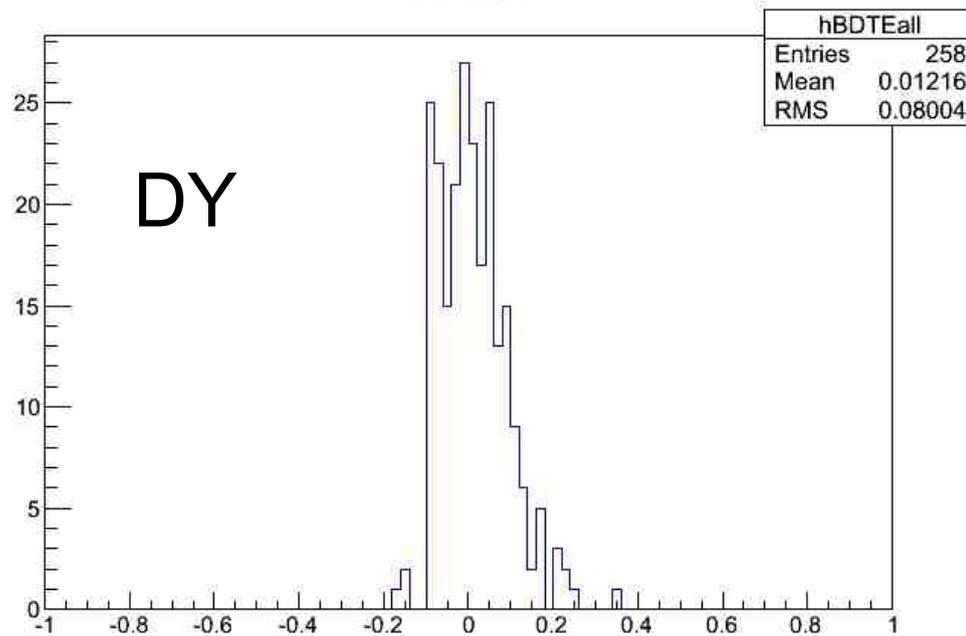
BDTEall



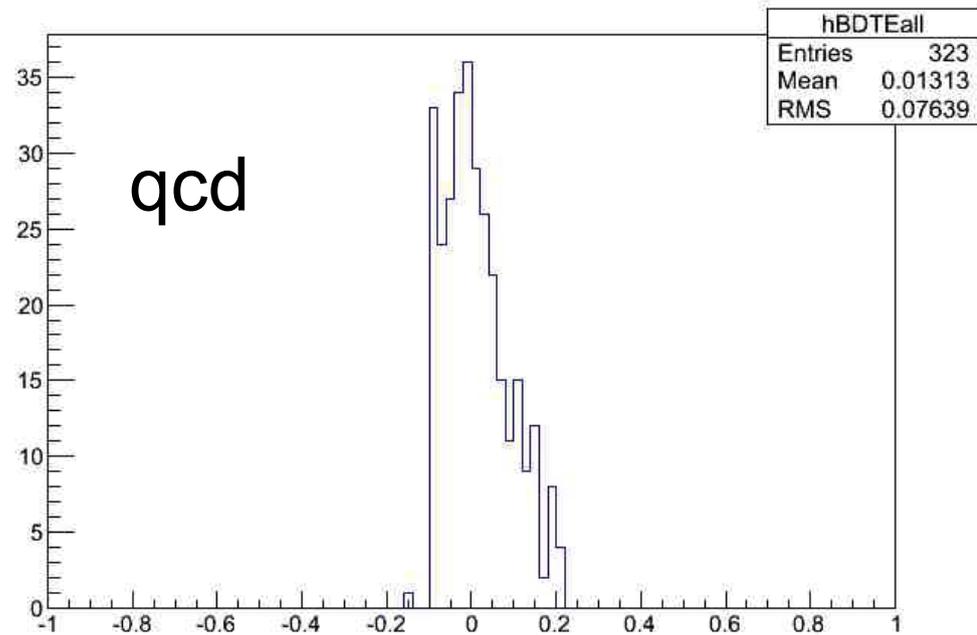
BDTEall



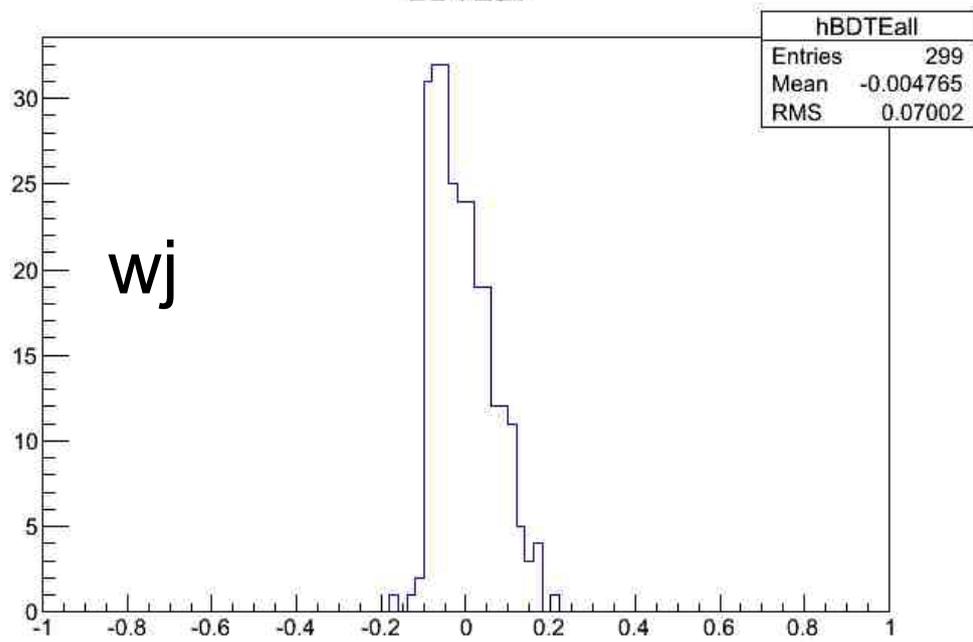
BDTEall



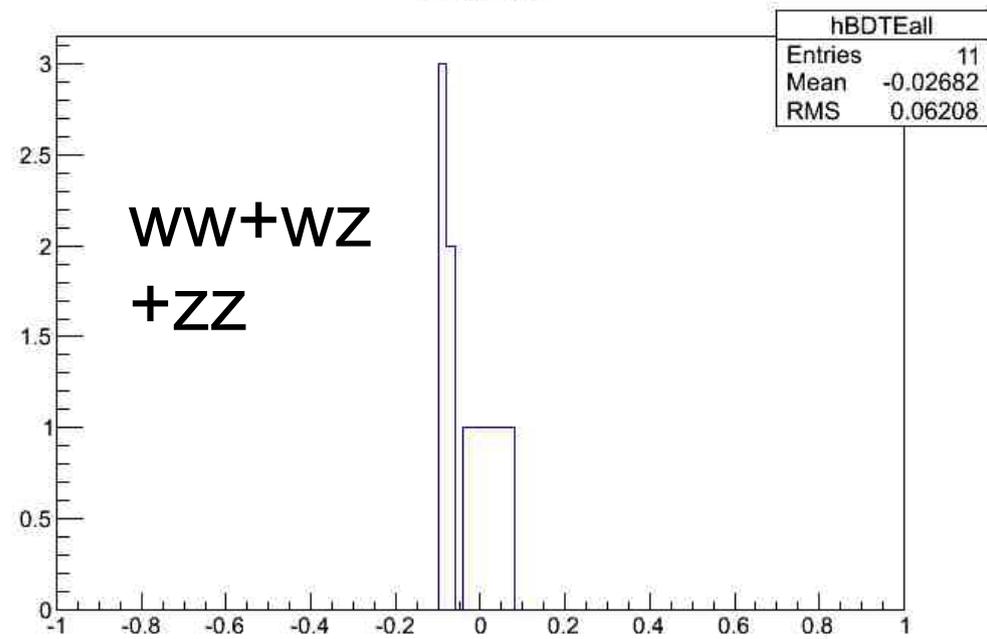
BDTEall



BDTEall



BDTEall



Migliore 4-pletta da BDT ricostruzione evento (nessun taglio)

Normalizzati a QCD

Iniziali (eventi) precedenti (eventi) muoni (sig+BKG)

TtSL	1830	1057	1076(898+179)
TtFL	1883	365	322(231+99)
DY	179793	426	258
QCD	360095	276	323
WW+WZ+ZZ	619	14	11
Wjets	11947	376	299

tt+tff = 61 (49+12)%

DY=11%

QCD=14%

WW+WZ+ZZ=0.5%

Wjets=13%

Tt alta statistica: inizio/DY/QCD/S1/Reco/Associazione

274685/249275/227800/182290/175710/(149759+31049) muoni

Eff tot =64.0±0.1%

Campione normalizzato a alta statistica

Nessun taglio su BDT migliore 4-pletta

	Tt	Ttf	Wj	Dyl	Dy	Qcd	Altro
Sls	19649	3196	-	-	-	-	1508
Slb	6894	2510	-	-	-	-	109
Slf	4563	2136	6778	1089	13248	8569	1889
Hs	18388	3185	-	-	-	-	153
Hb	5002	2339	-	-	-	-	982
Hf	5726	2589	8237	1042	12715	9310	2414

Sls+Slb = 33866 (47%)

Slf=38272 (53%)

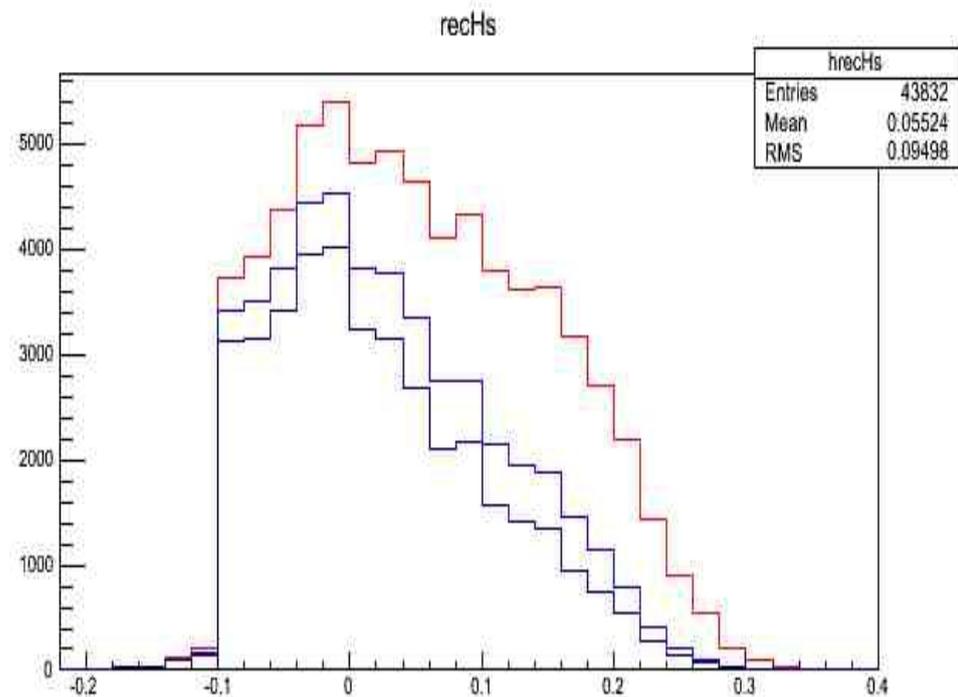
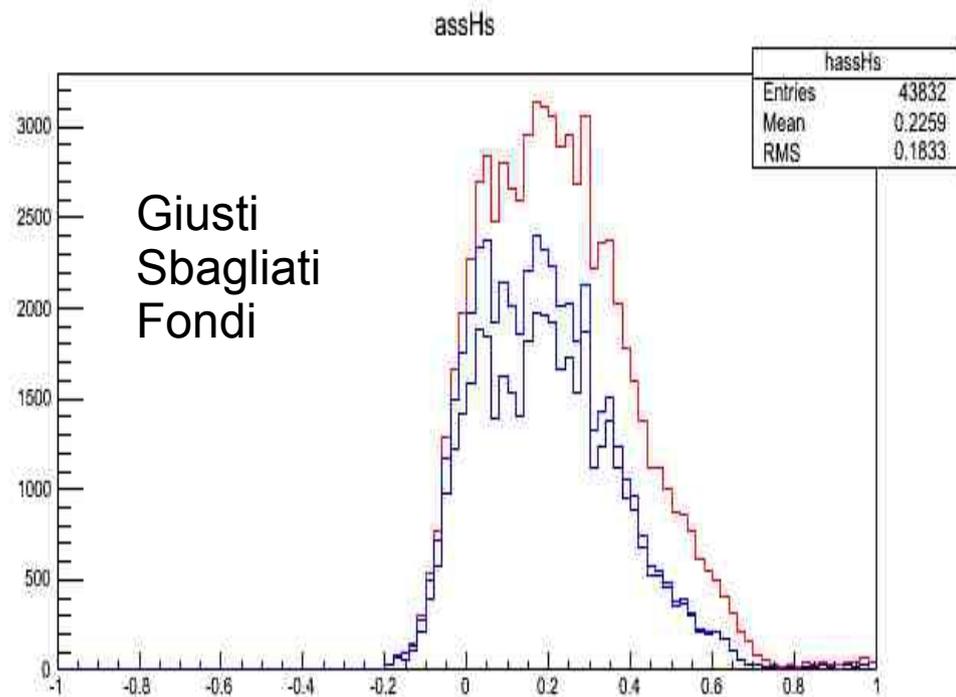
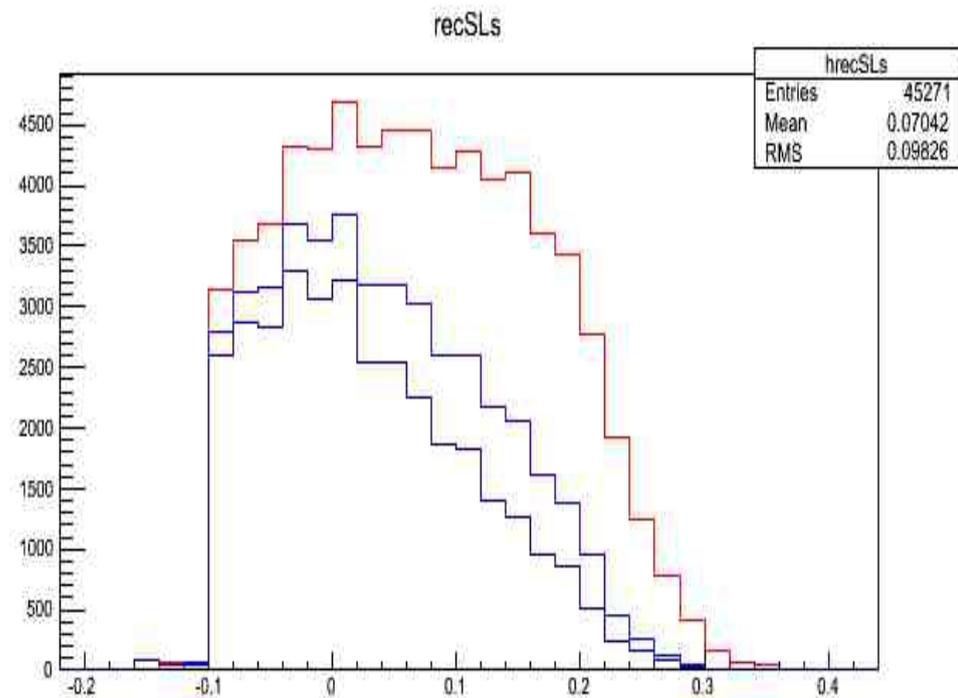
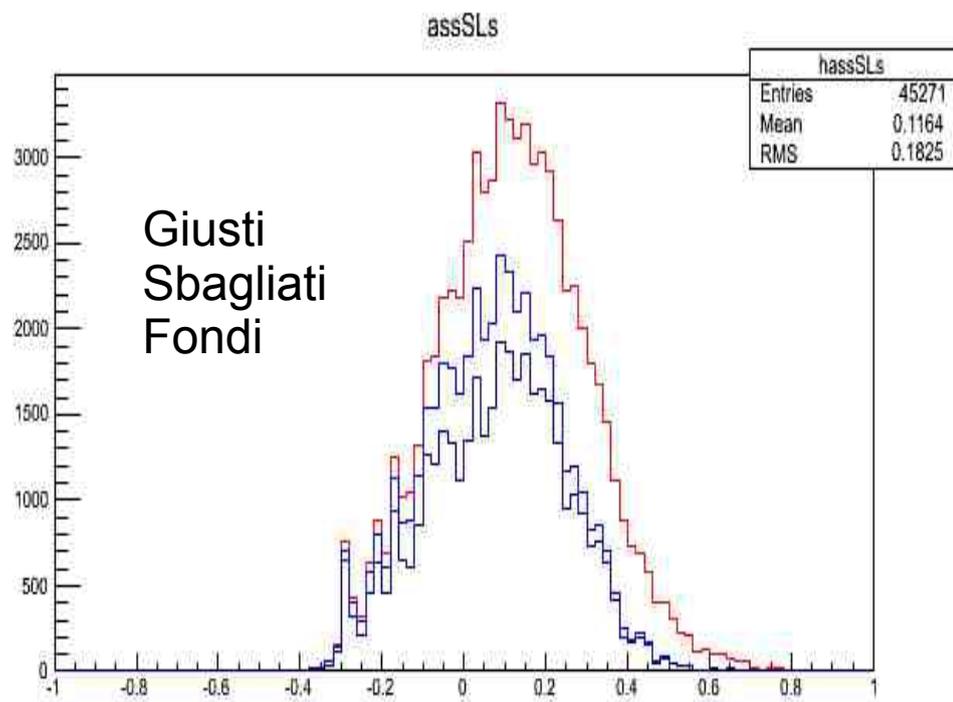
Hs+Hb = 30049 (42%)

HF = 42033 (58%)

Troppi fondi e problemi per bassa statistica di QCD

Si deve indurire la selezione

Vedi plot seguente



Campione normalizzato a alta statistica

Taglio su BDT migliore 4-pletta > 0.05

	Tt	Ttf	Wj	Dyl	Dy	Qcd	Altro
Sls	16950	1798	-	-	-	-	678
Slb	5178	1255	-	-	-	-	46
Slf	3652	1158	1433	303	3888	2645	969
Hs	14860	1510	-	-	-	-	76
Hb	3573	1039	-	-	-	-	309
Hf	4488	1348	1485	241	2794	2539	1127

Sls+Slb = 25905 (65%)

Slf=14048 (35%)

Hs+Hb = 21367 (60%)

HF = 14022 (40%)

Probabilità di giusta associazione

Top da verità MC partendo dal muone

Jet del muone assegnato al top SL = $74.7 \pm 0.9\%$

Jet del muone assegnato al top H = $75.6 \pm 1.0\%$

Media = $75.1 \pm 0.7\%$

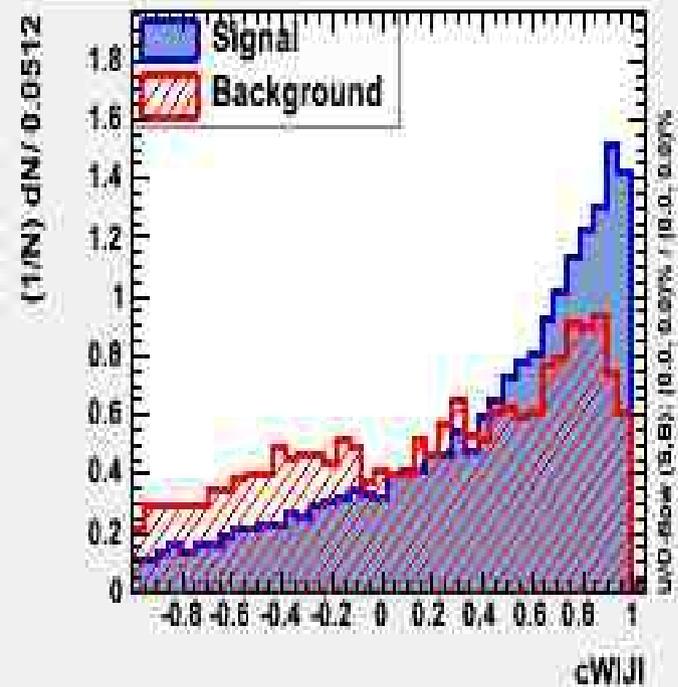
Top da verità MC partendo dal jet

Jet del muone assegnato al top SL = $76.6 \pm 0.9\%$

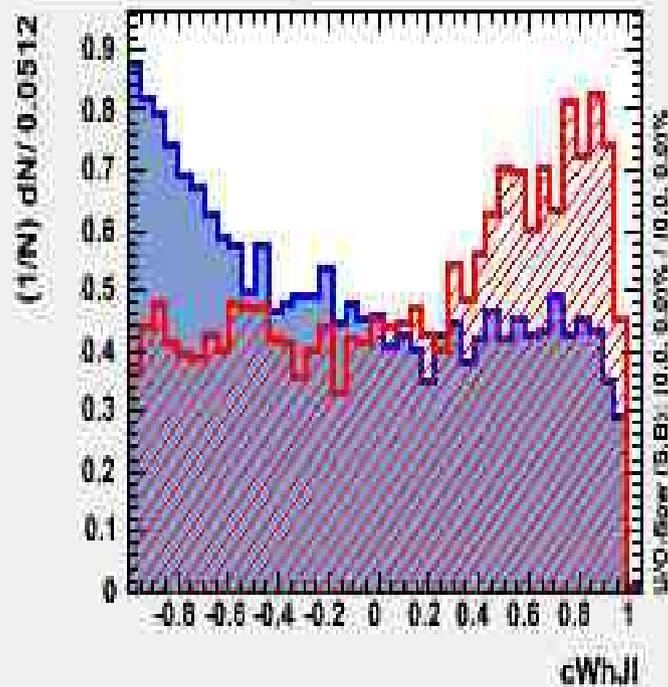
Jet del muone assegnato al top H = $79.4 \pm 1.0\%$

Media = $77.9 \pm 0.7\%$

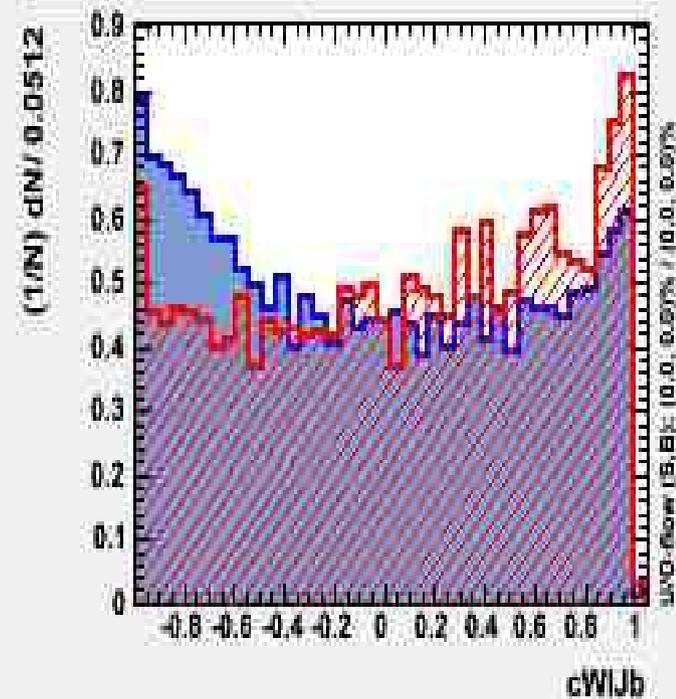
Input variable: cWIJl



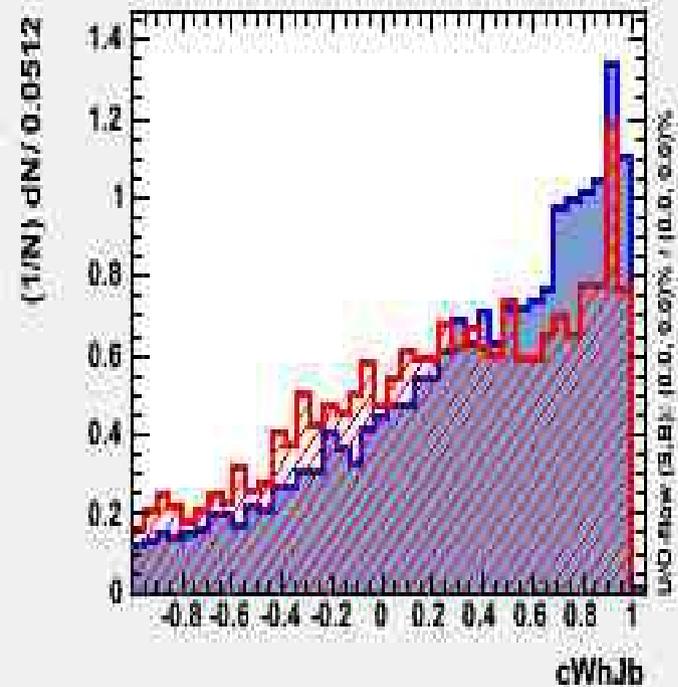
Input variable: cWhJl



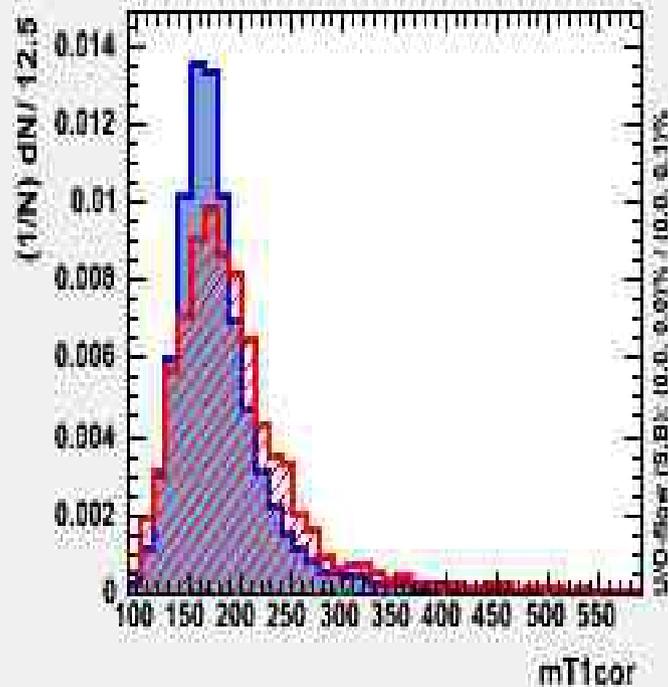
Input variable: cWIJb



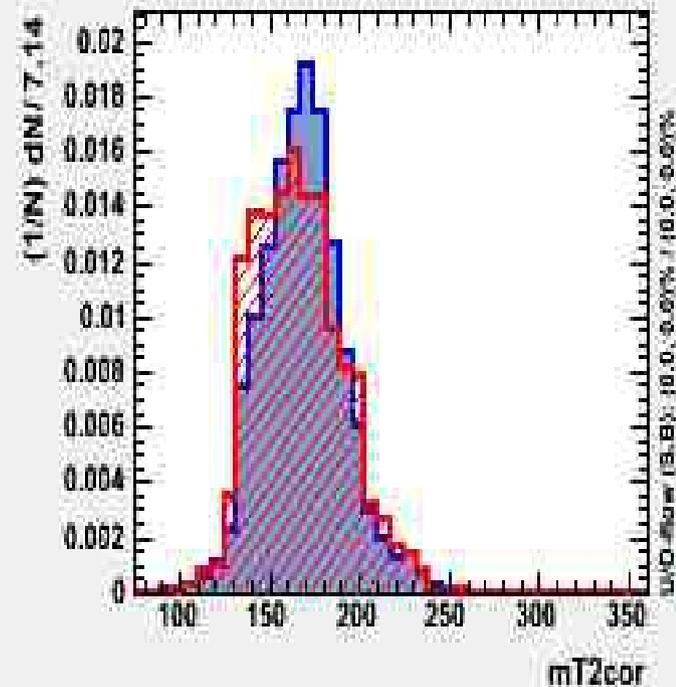
Input variable: cWhJb



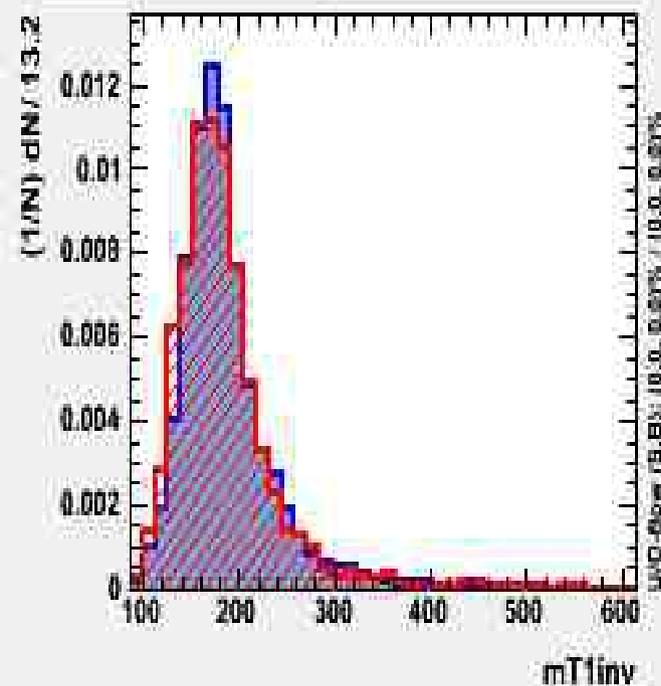
Input variable: mT1cor



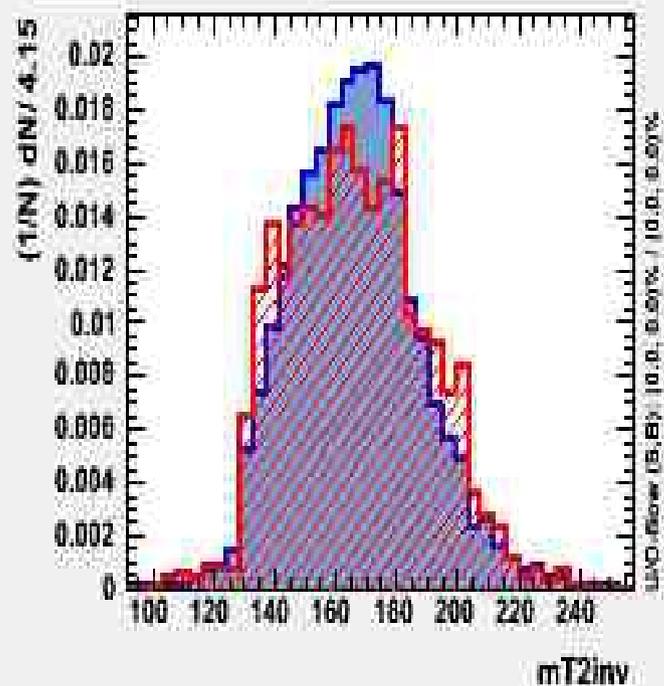
Input variable: mT2cor



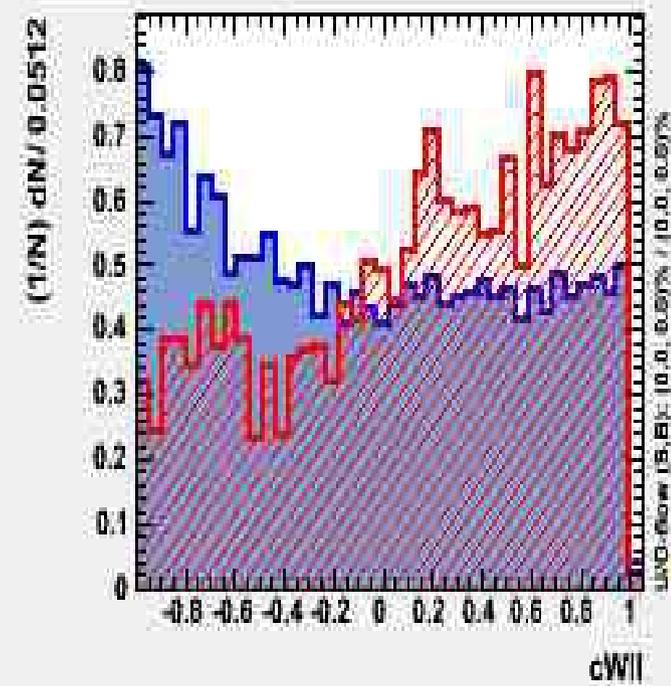
Input variable: mT1inv



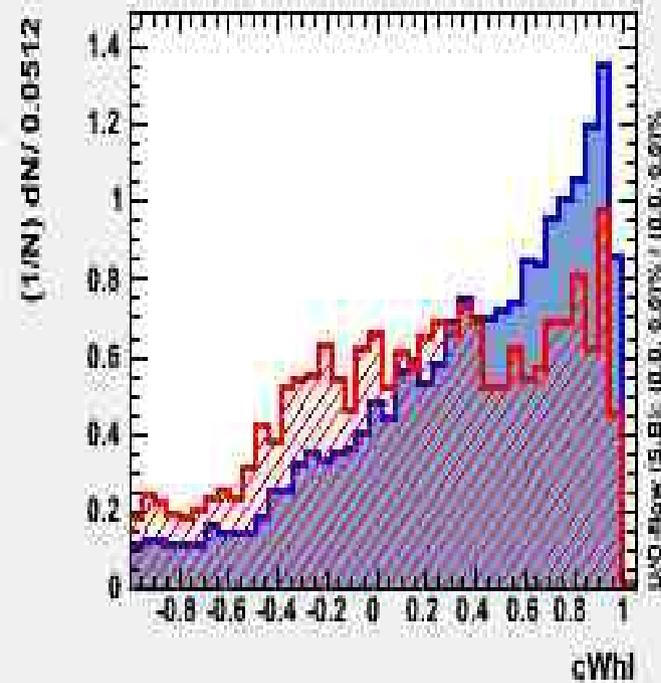
Input variable: mT2inv



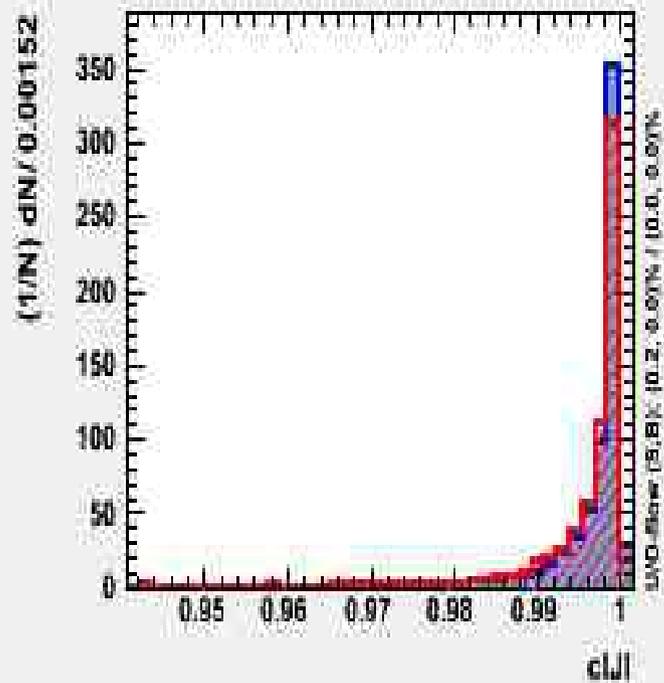
Input variable: cWl



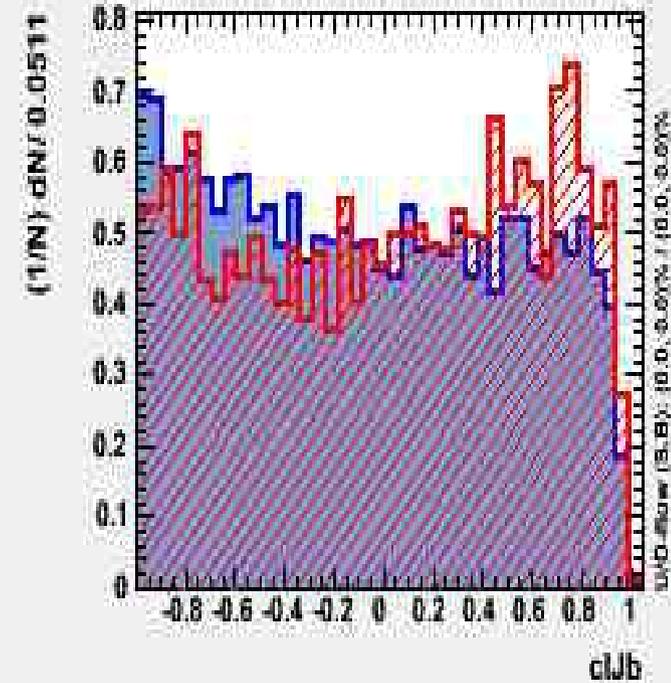
Input variable: cWhl



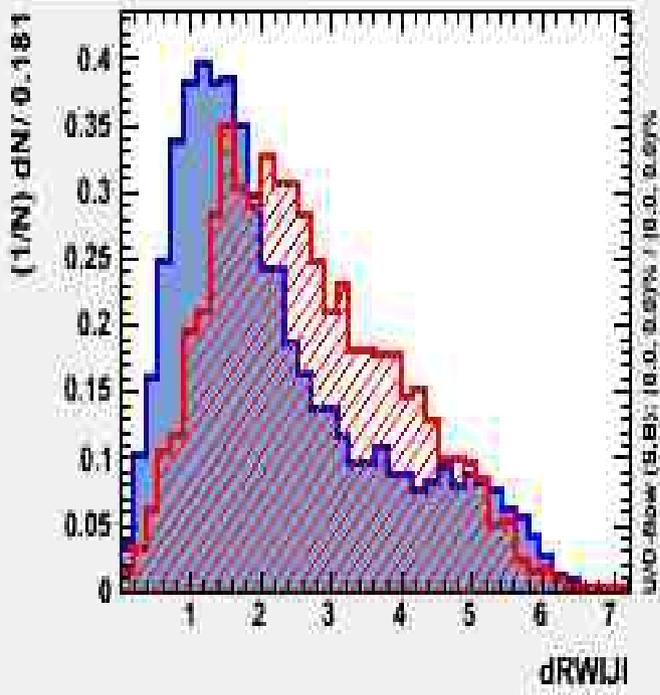
Input variable: cJl



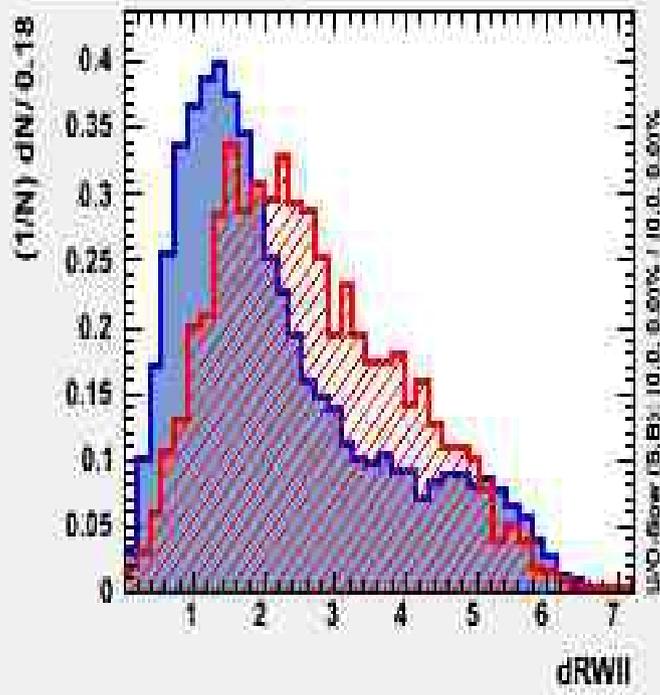
Input variable: cJb



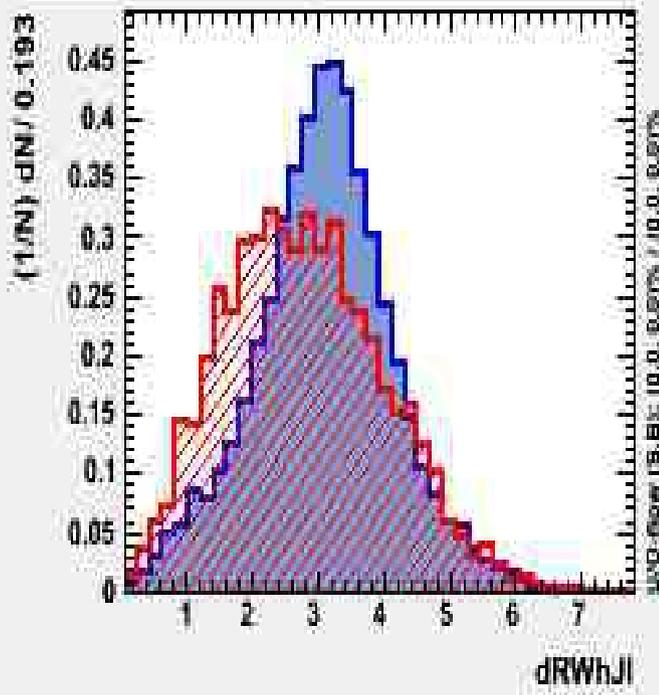
Input variable: dRWLj



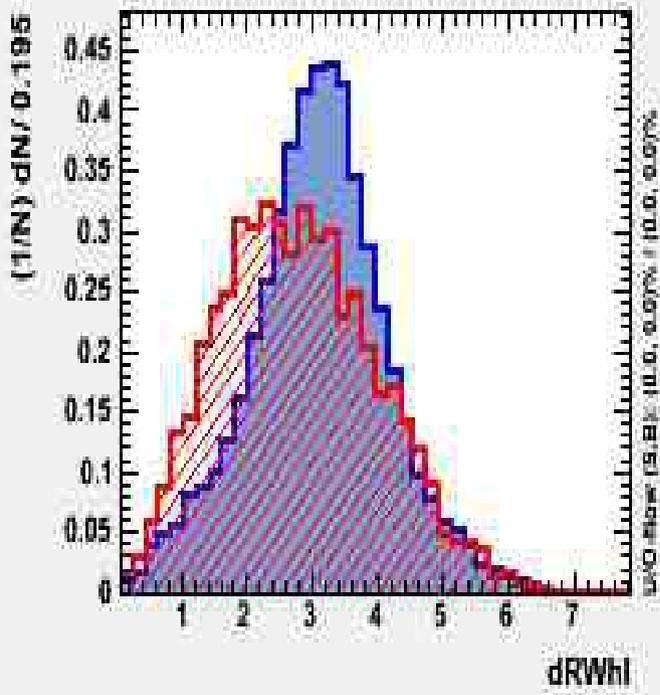
Input variable: dRWl



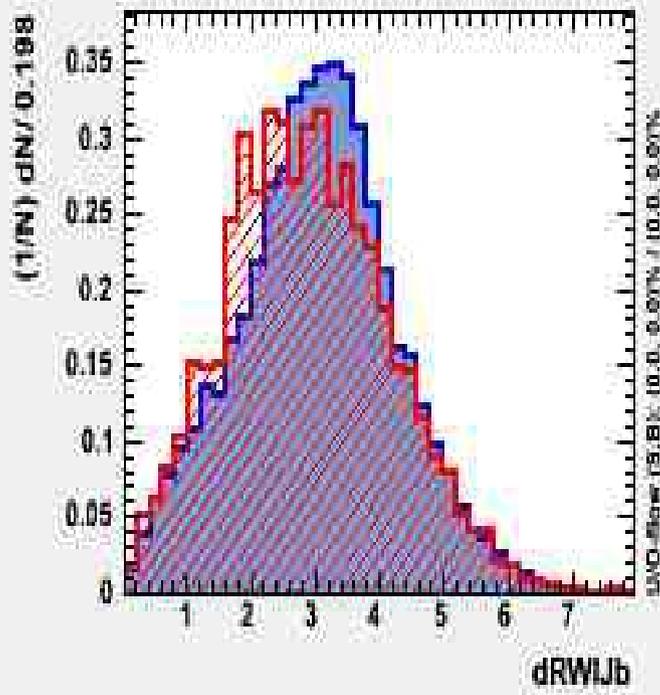
Input variable: dRWWhj



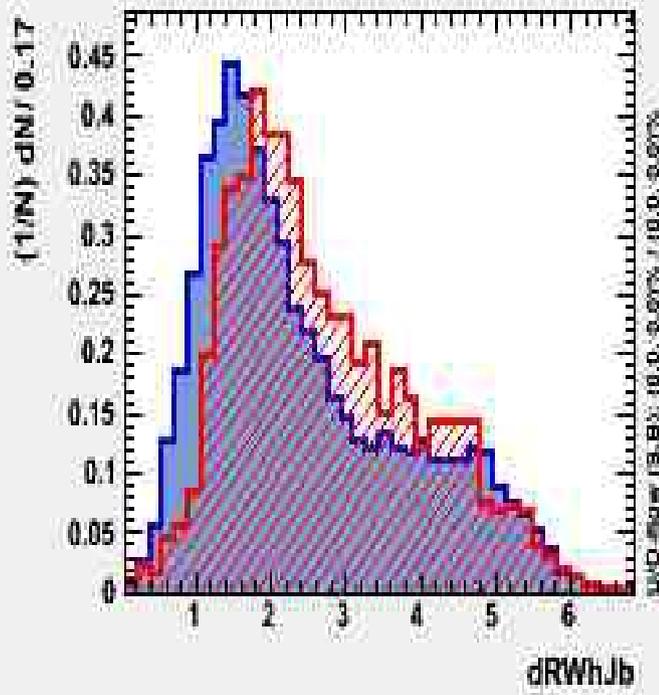
Input variable: dRWWh



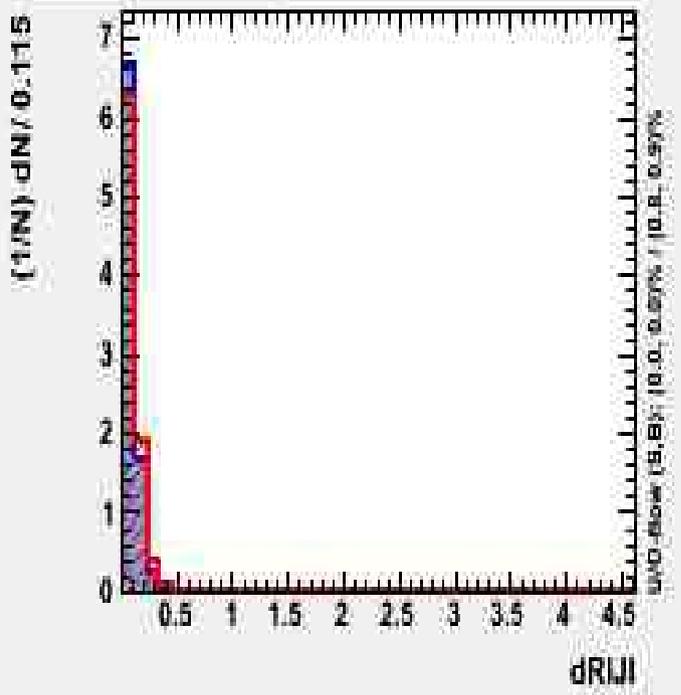
Input variable: dRWLjb



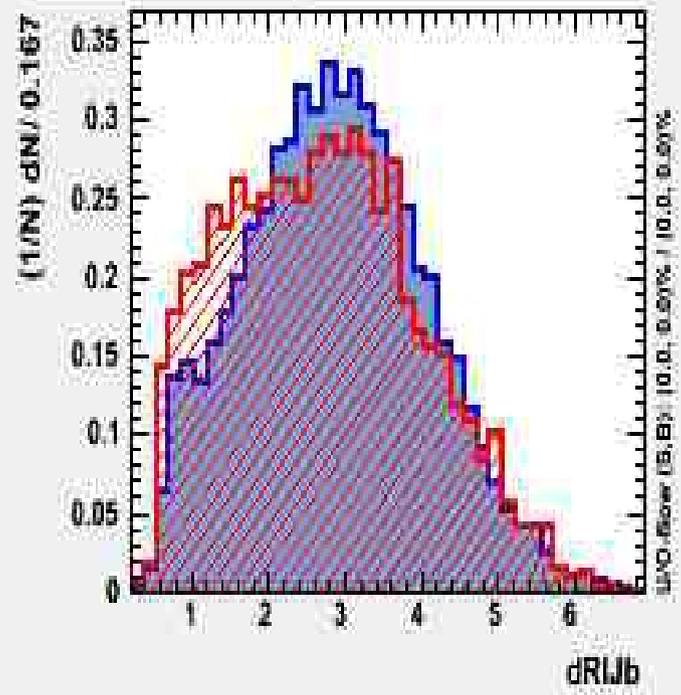
Input variable: dRWWhjb



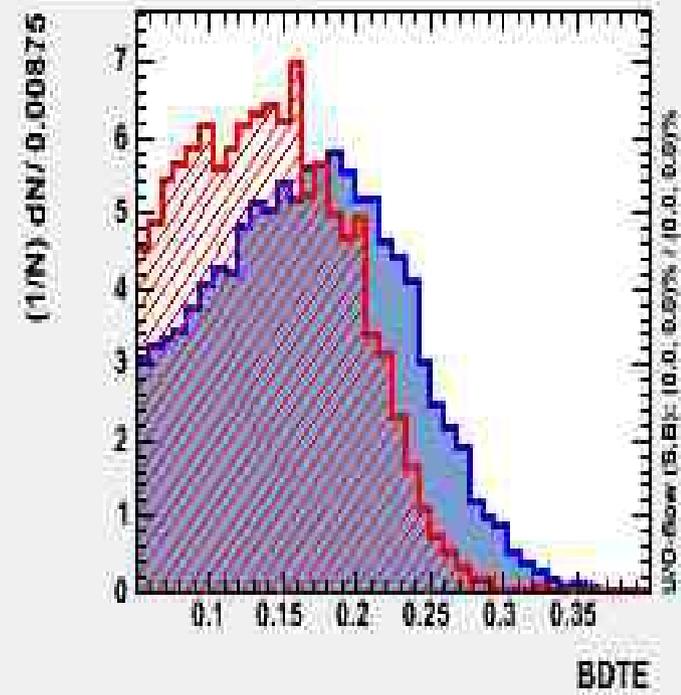
Input variable: dRII



Input variable: dRIIb

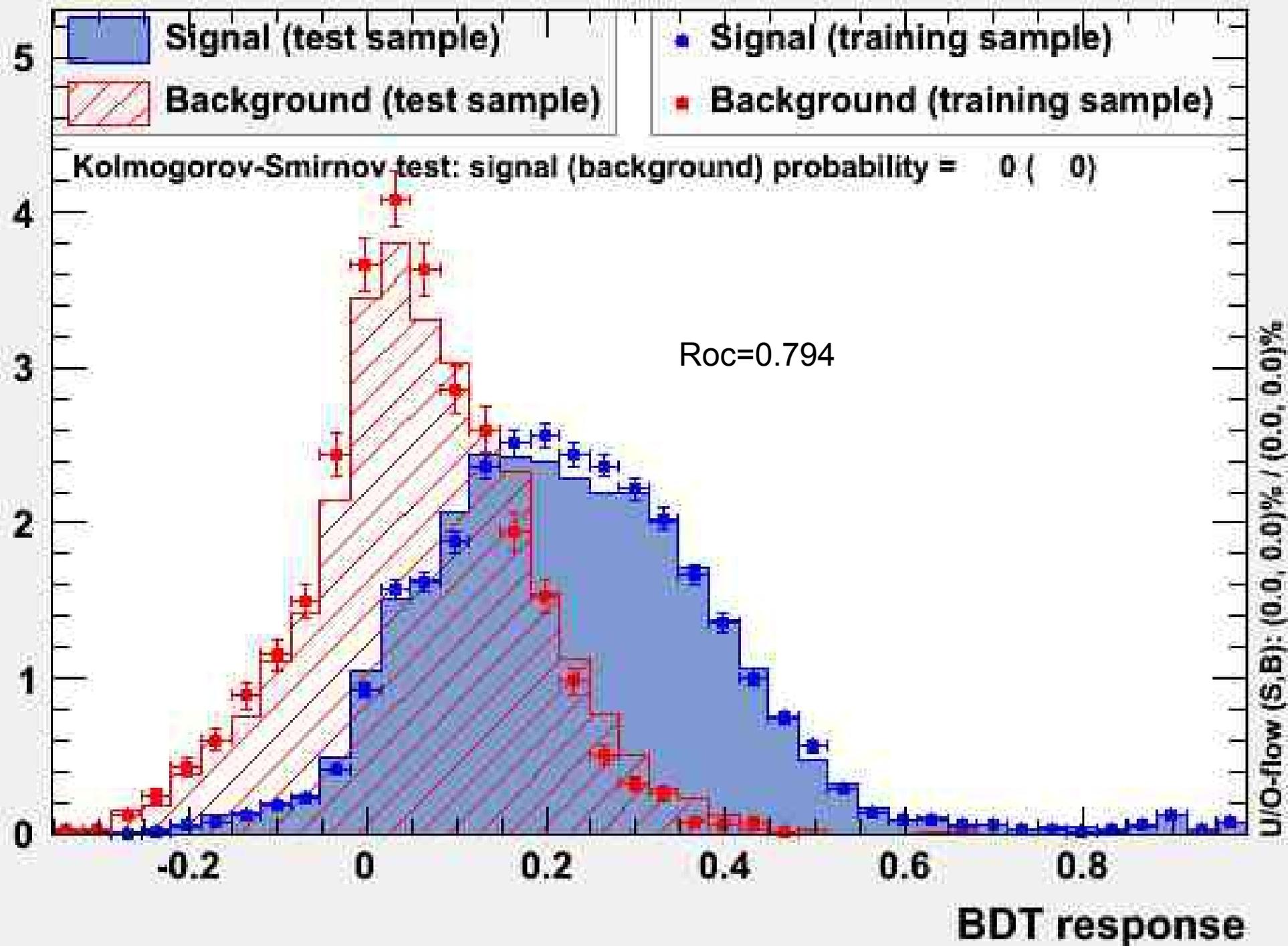


Input variable: BDTE

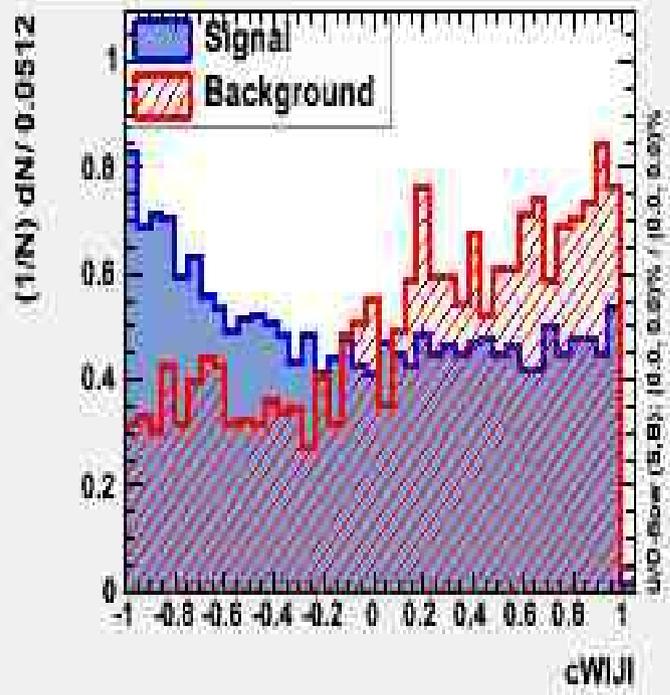


TMVA overtraining check for classifier: BDT

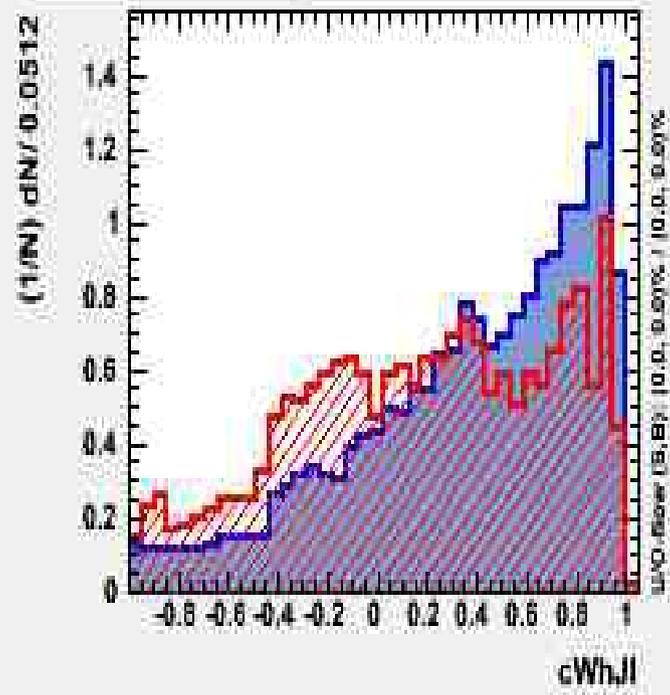
$(1/N) dN/dx$



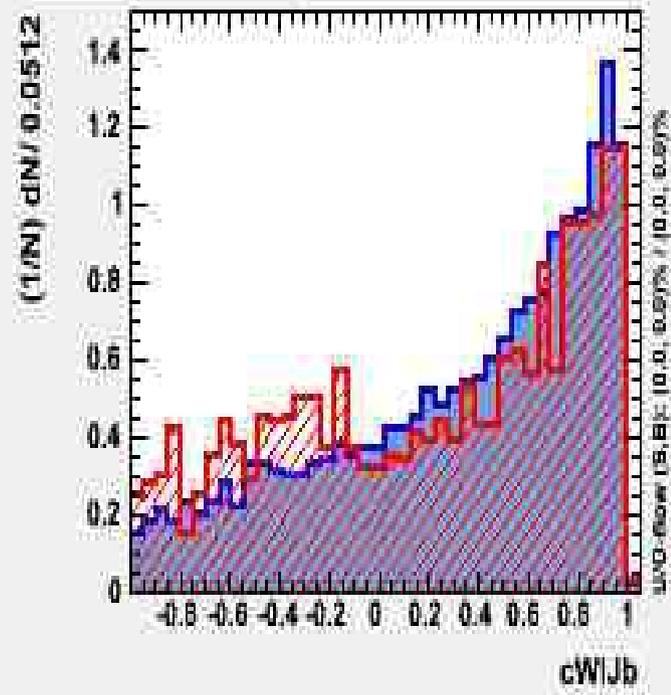
Input variable: cWlJl



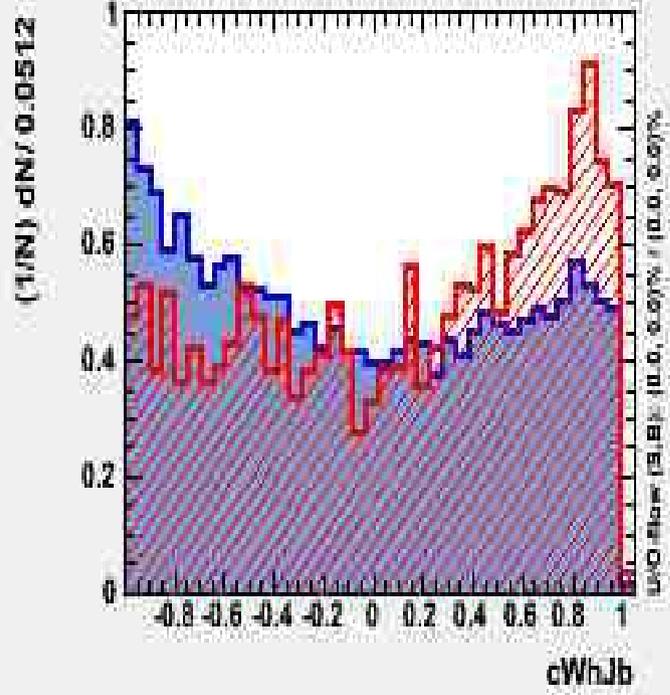
Input variable: cWhJl



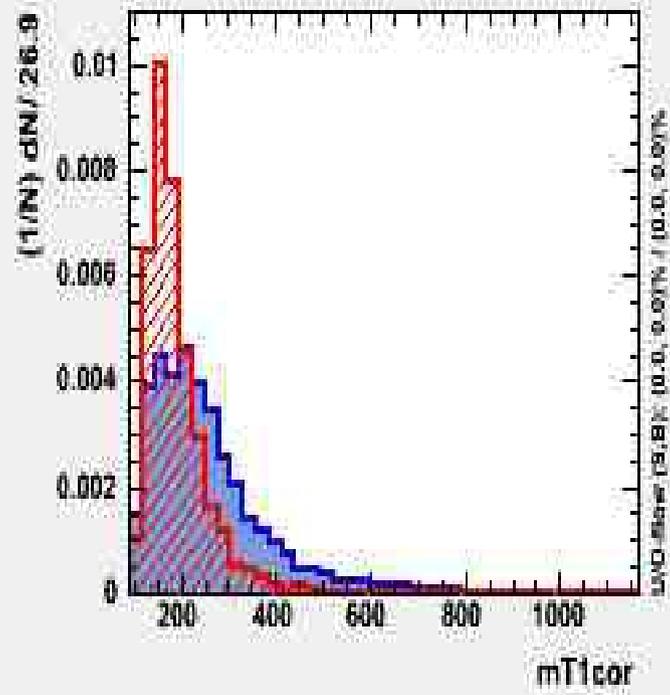
Input variable: cWlJb



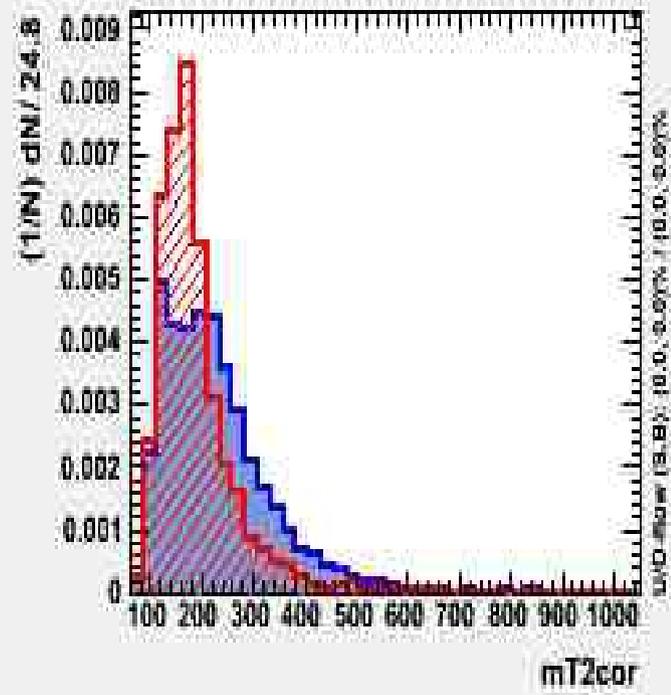
Input variable: cWhJb



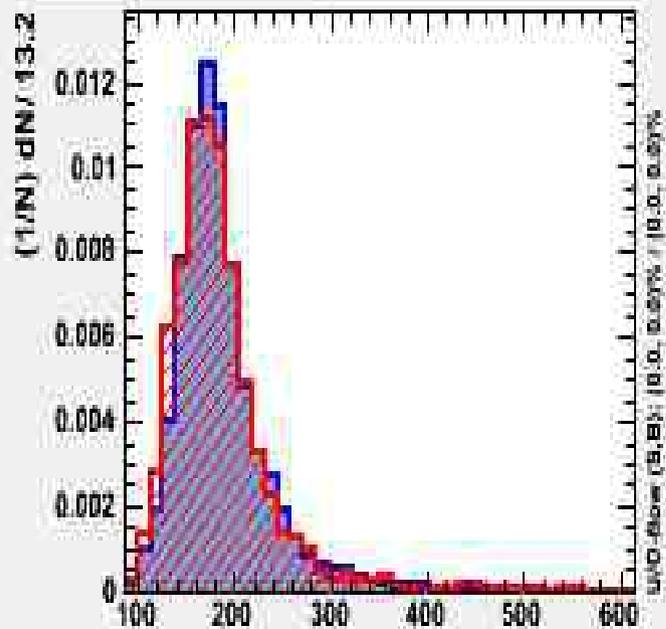
Input variable: mT1cor



Input variable: mT2cor

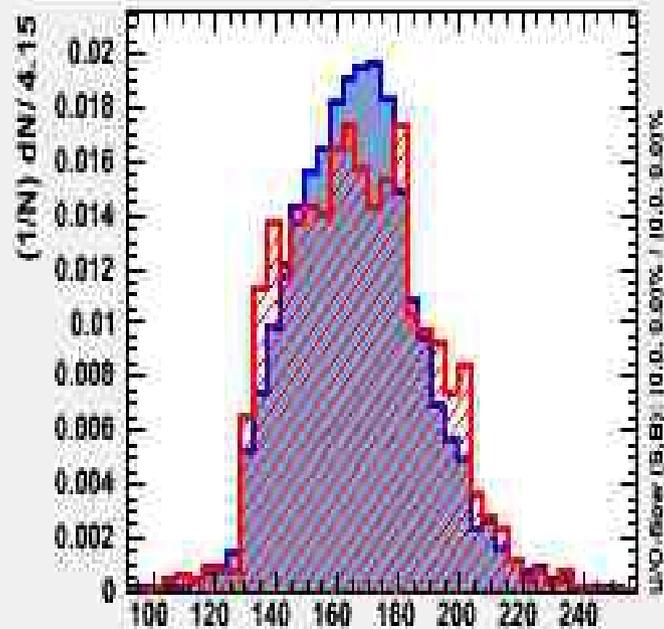


Input variable: mT1inv



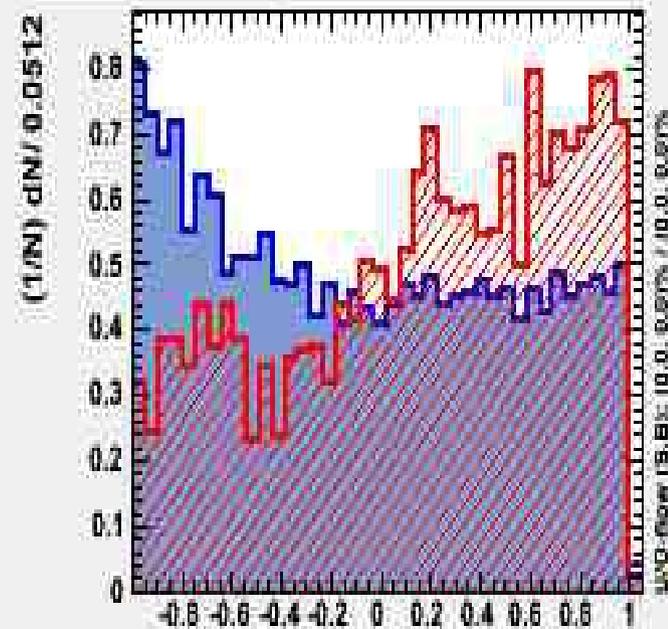
mT1inv

Input variable: mT2inv



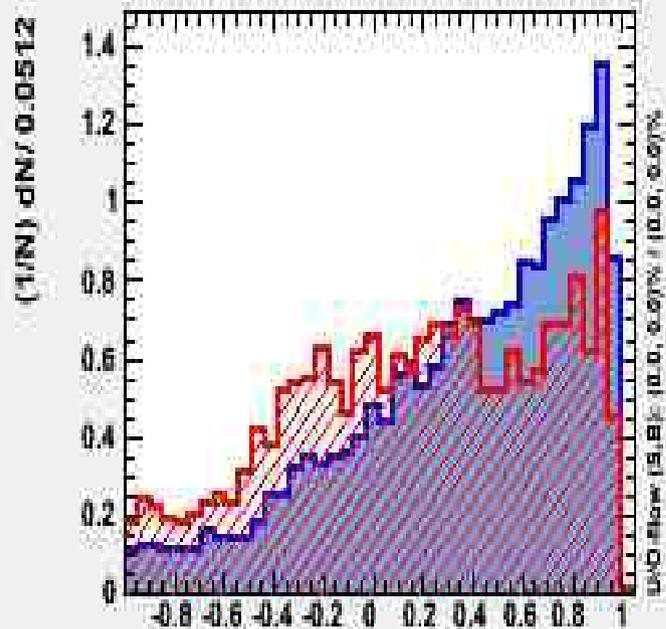
mT2inv

Input variable: cWll



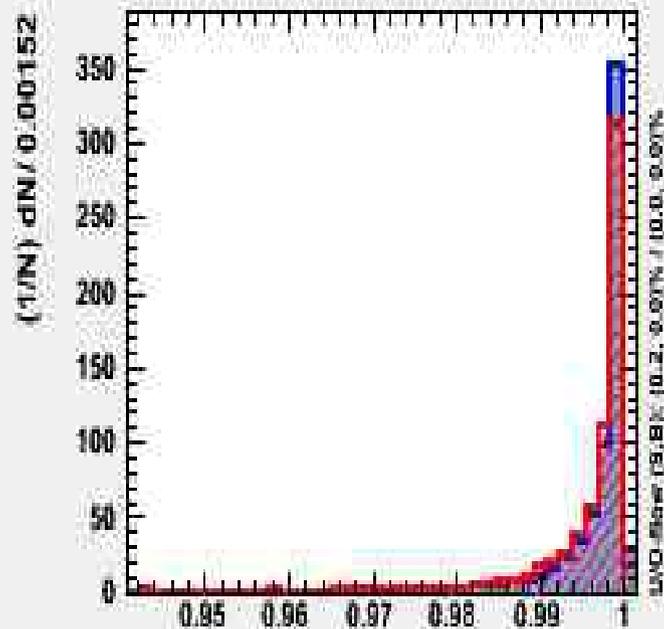
cWll

Input variable: cWhl



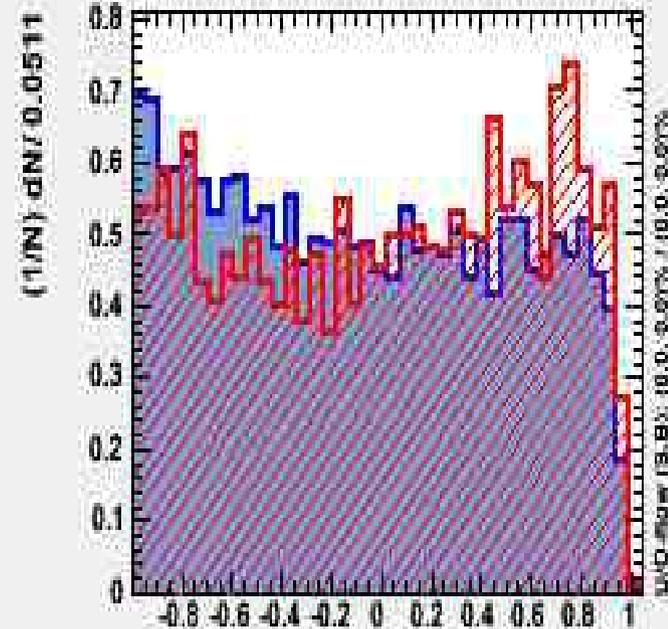
cWhl

Input variable: cJl



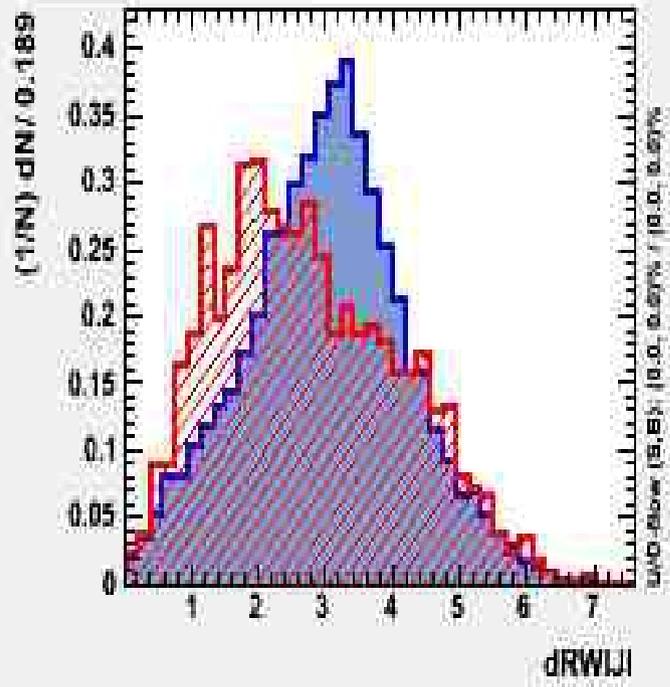
cJl

Input variable: cJlb

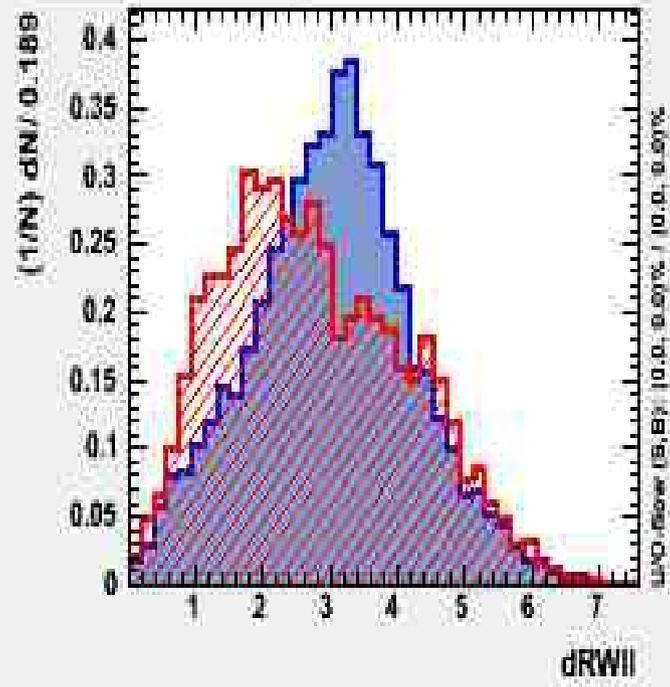


cJlb

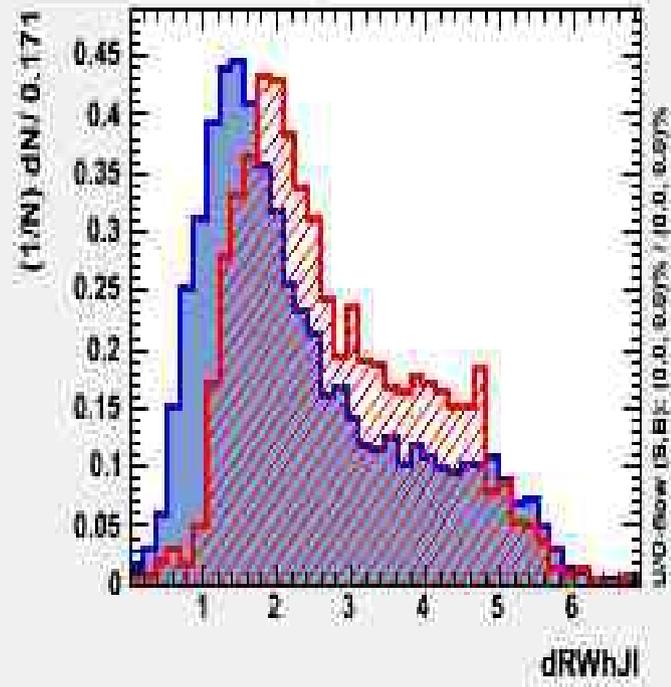
Input variable: dRWIi



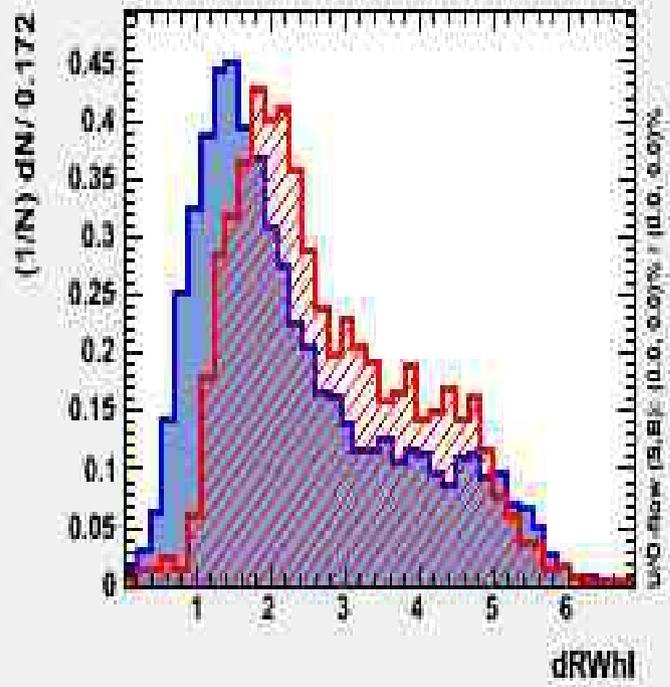
Input variable: dRWI



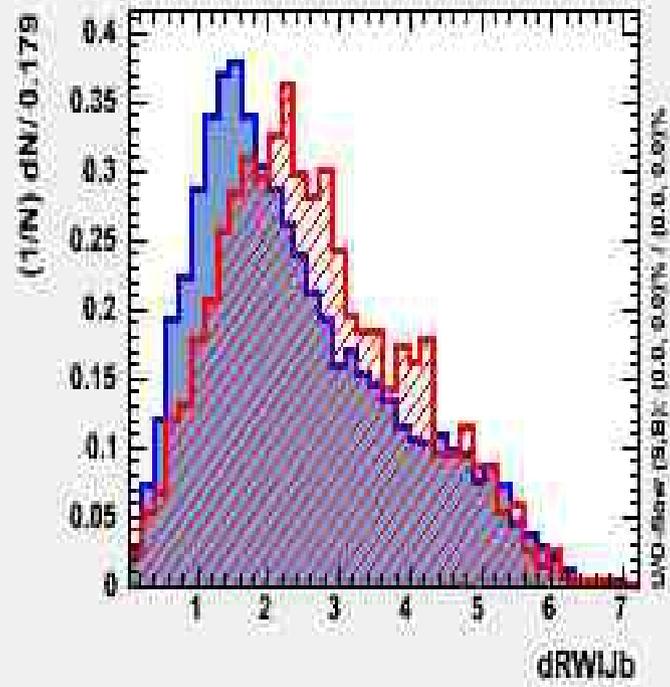
Input variable: dRWHi



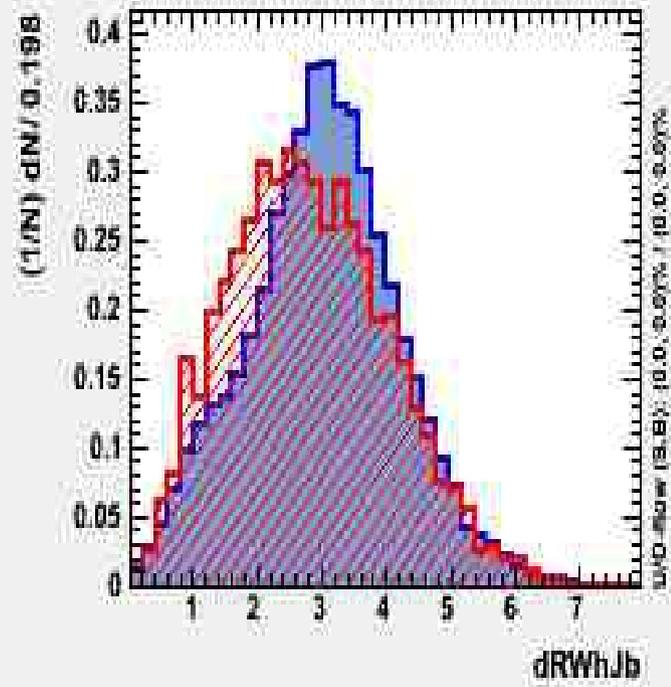
Input variable: dRWHi



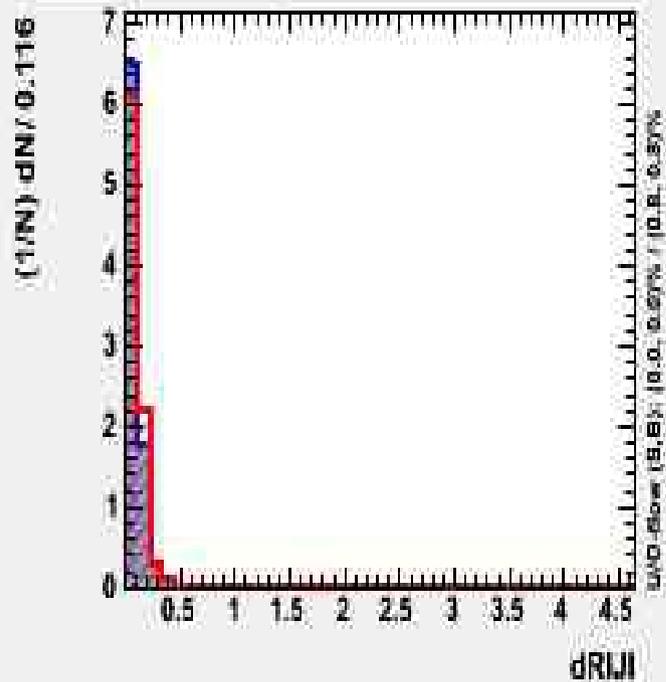
Input variable: dRWIjb



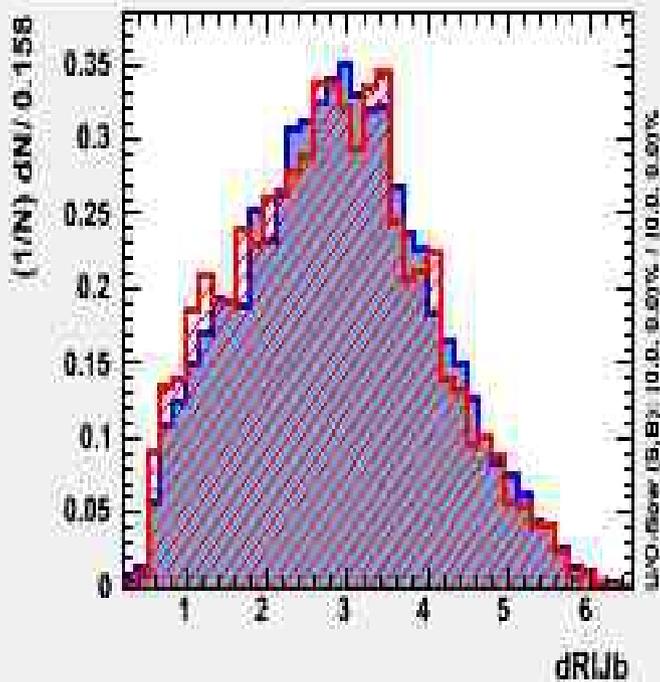
Input variable: dRWHijb



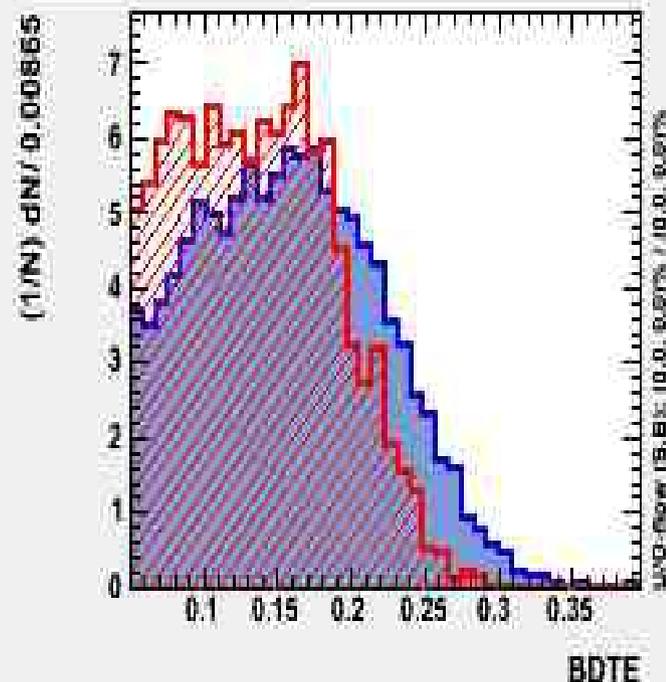
Input variable: dRII



Input variable: dRIIb

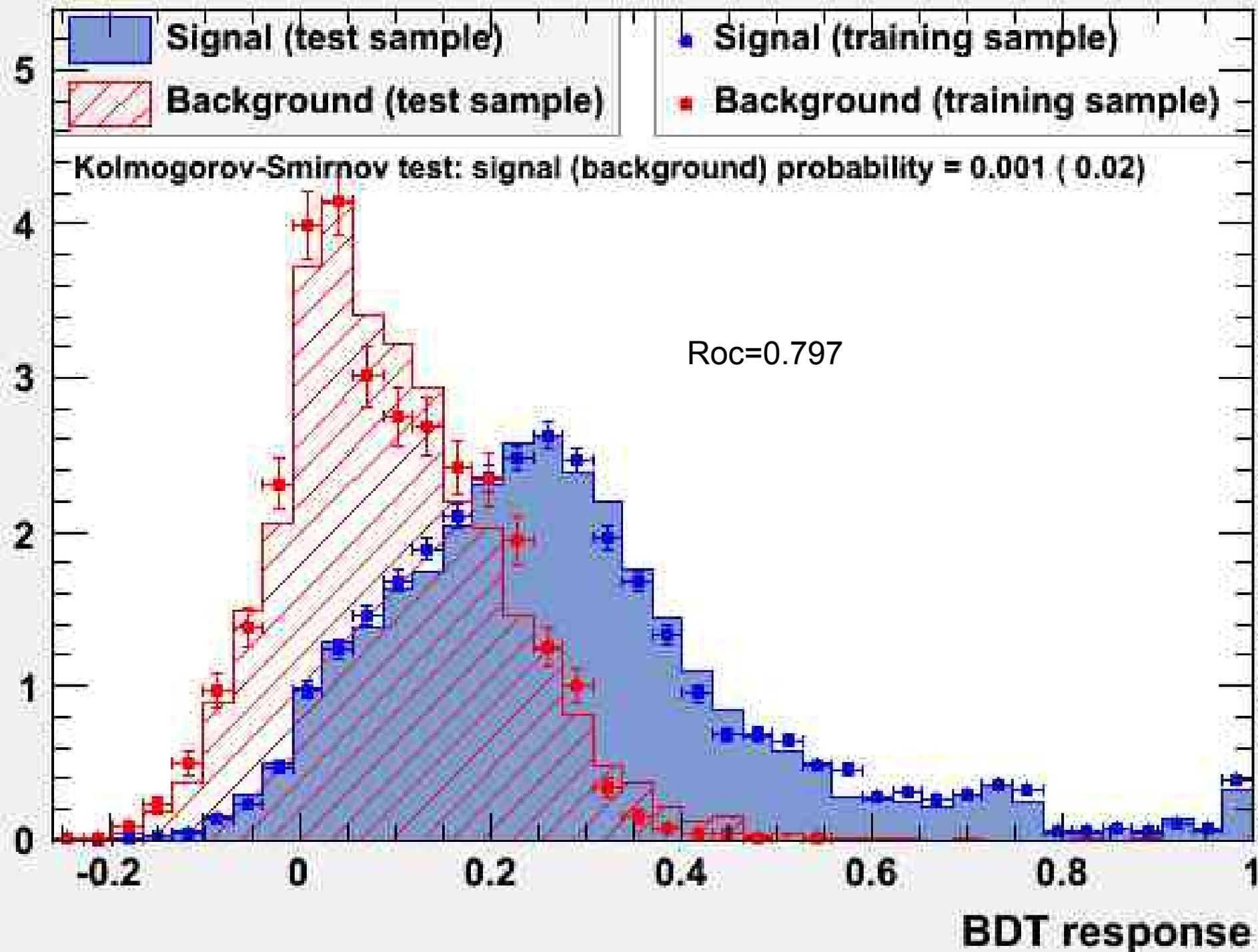


Input variable: BDTE

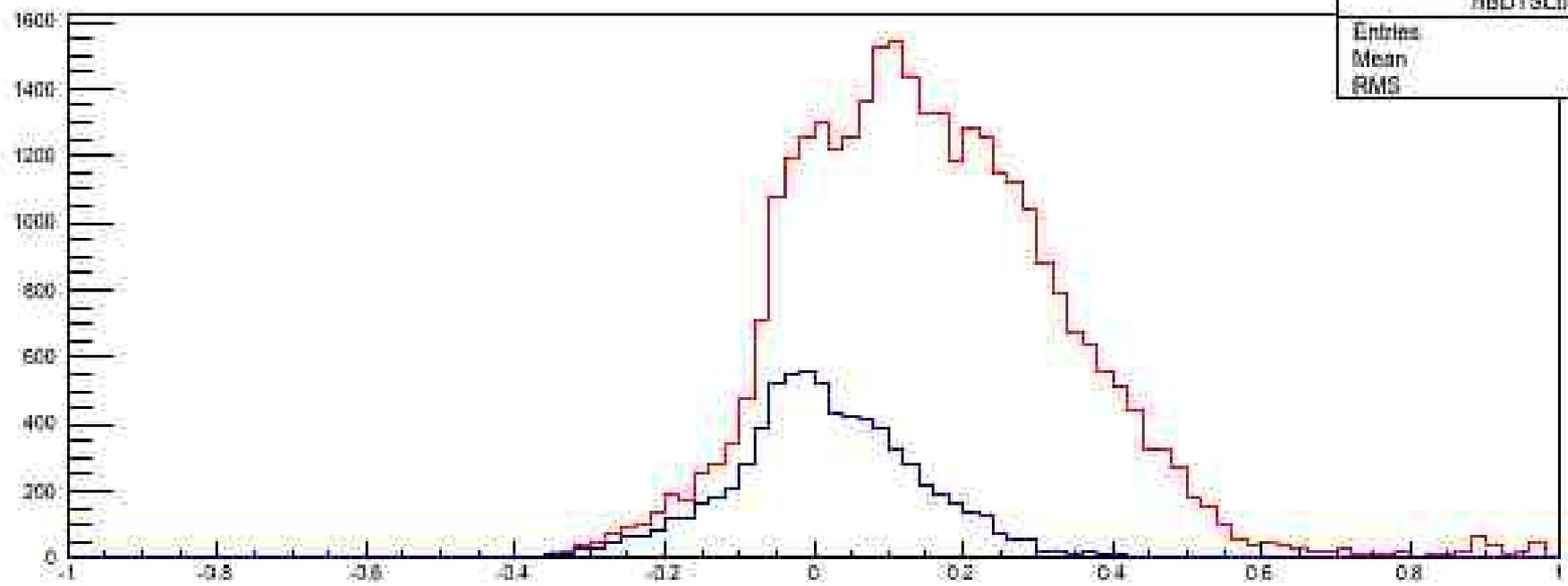


TMVA overtraining check for classifier: BDT

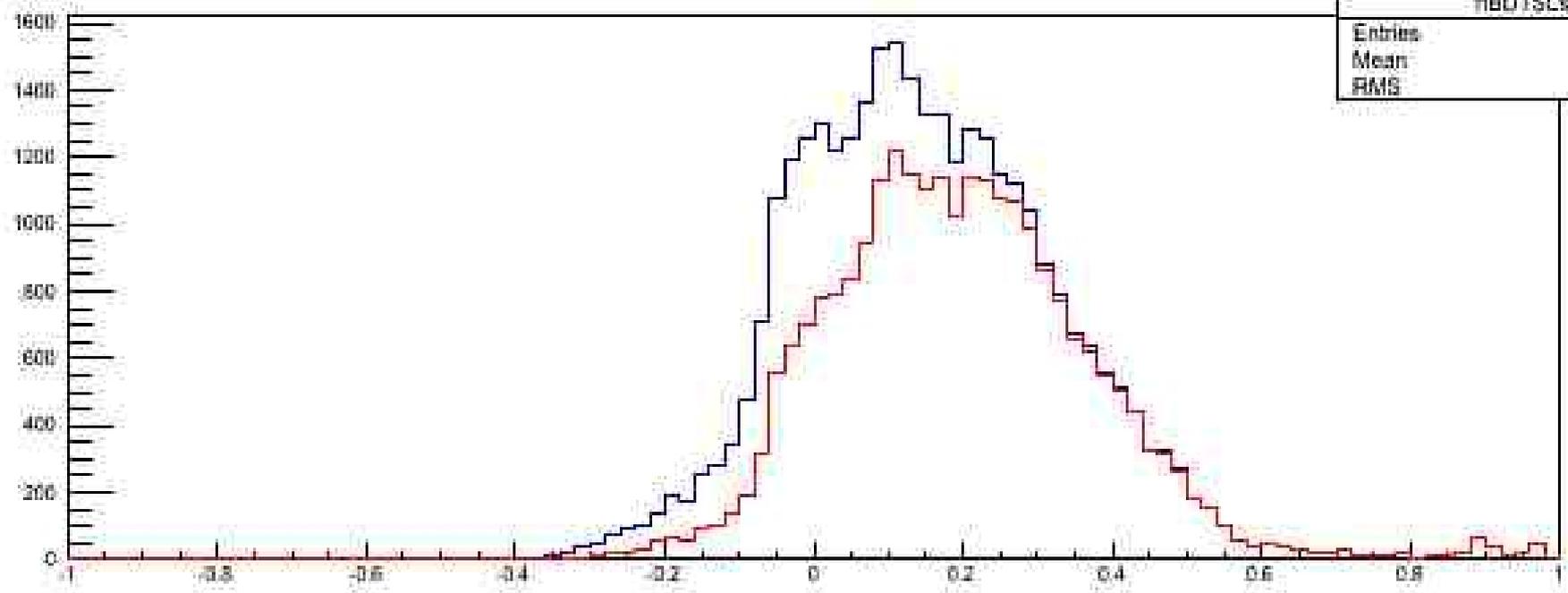
$(1/N) dN/dx$



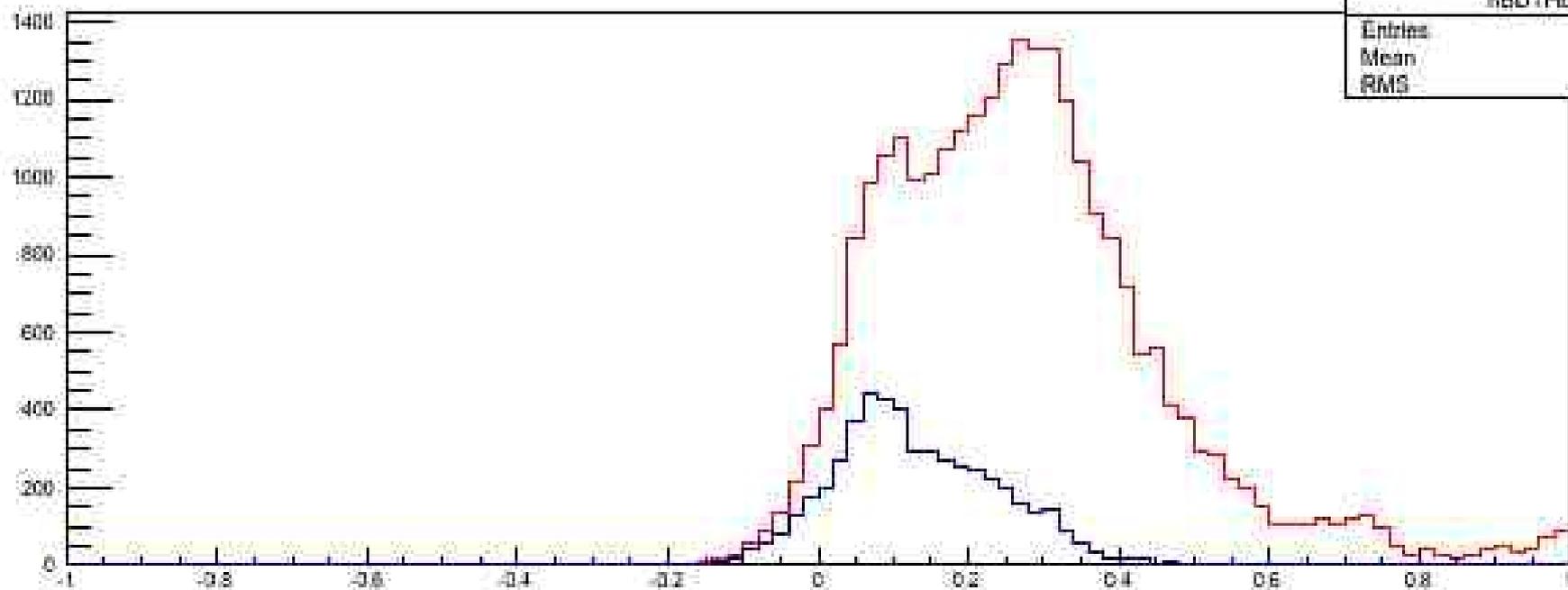
BDTSLb



BDTSLs

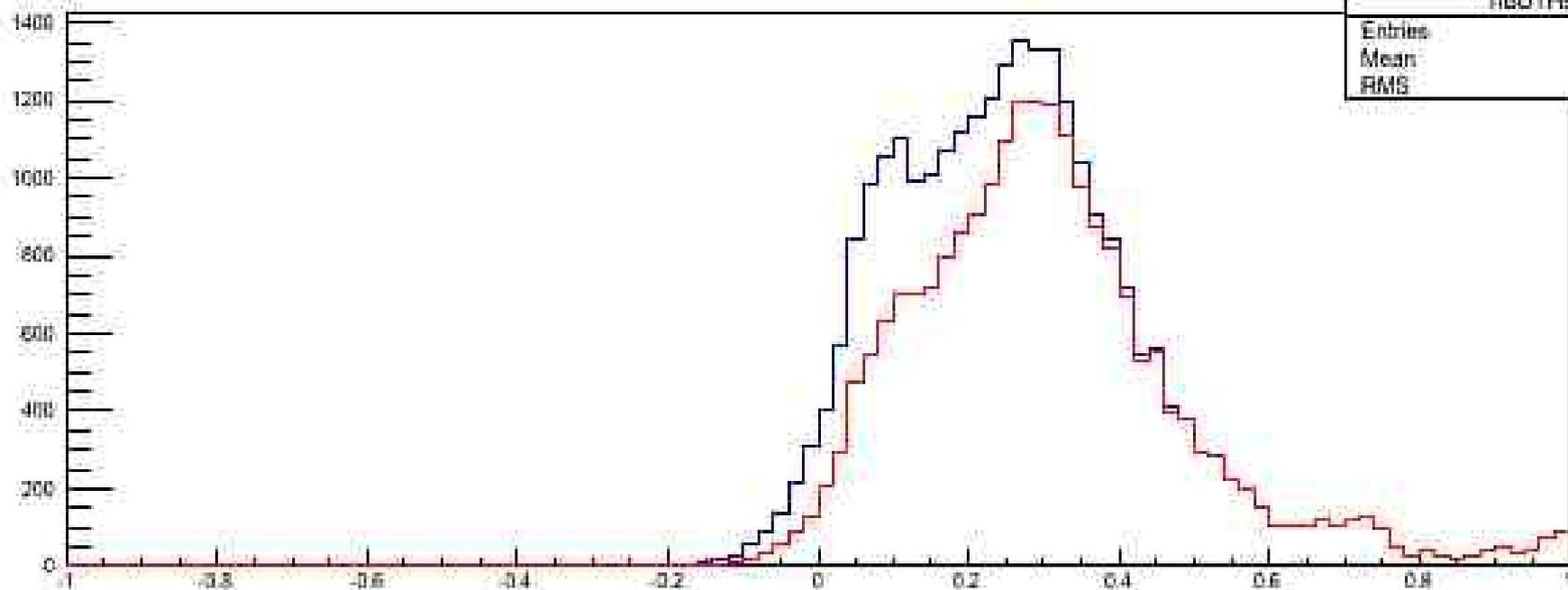


BDTHb



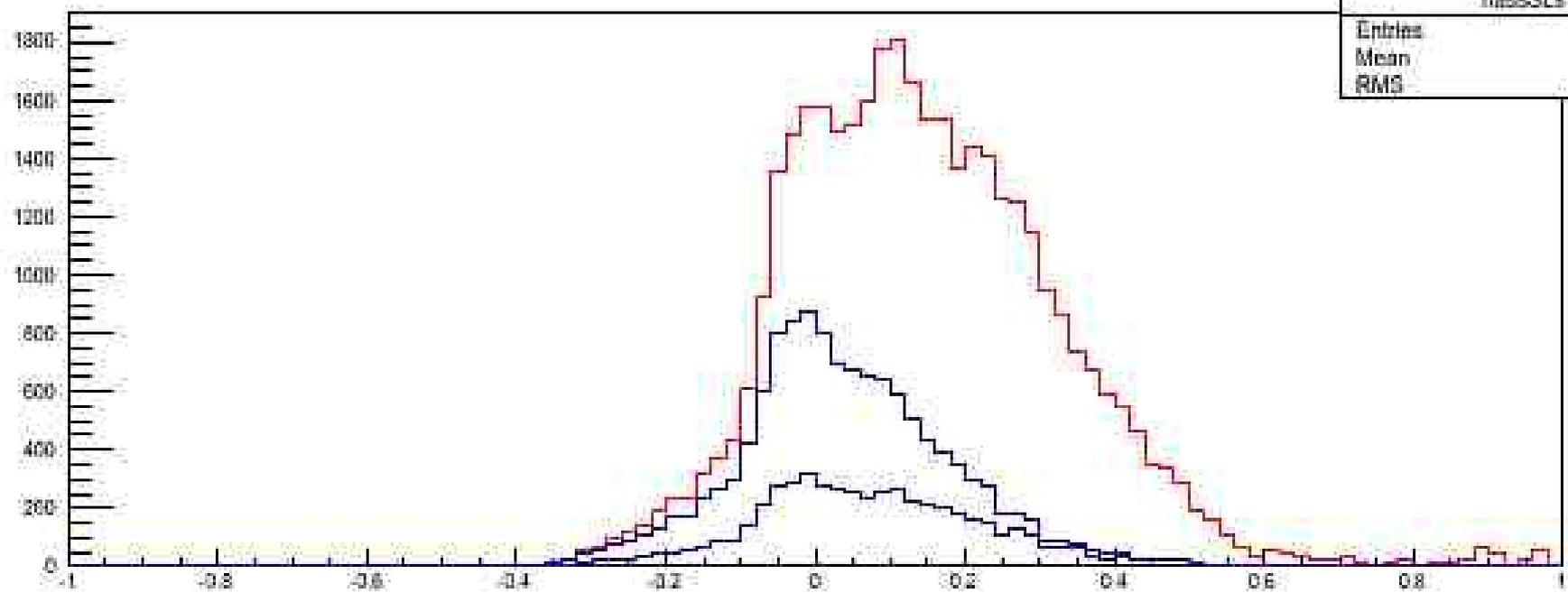
rBDTHb	
Entries	26901
Mean	0.271
RMS	0.1841

BDTHs

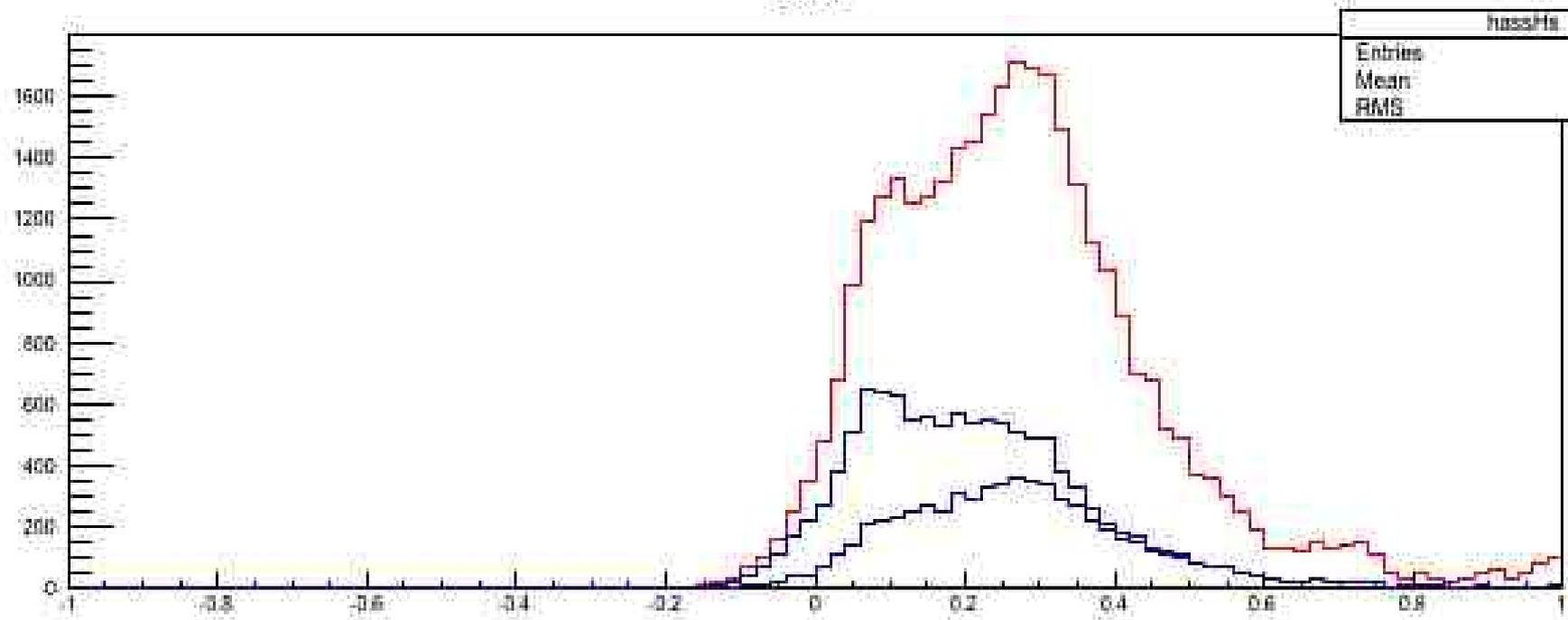


rBDTHs	
Entries	26901
Mean	0.271
RMS	0.1841

assSLs



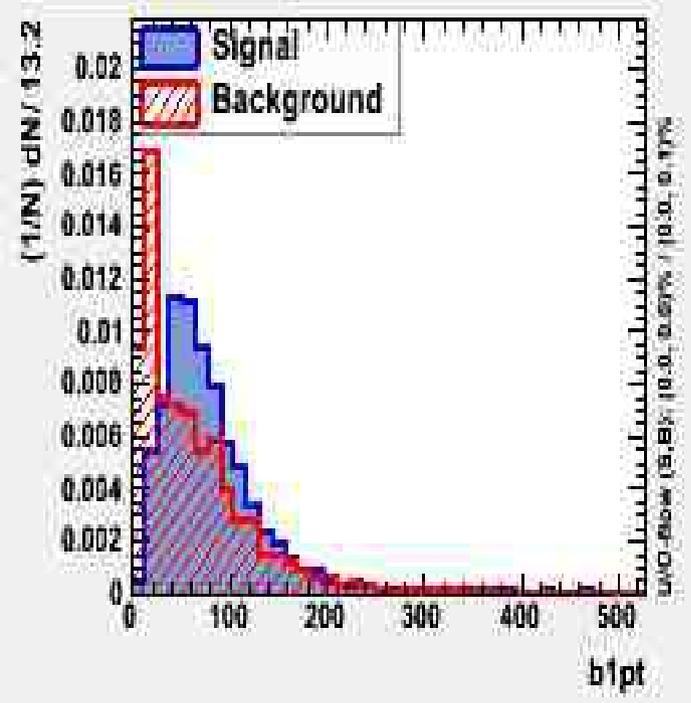
assHs



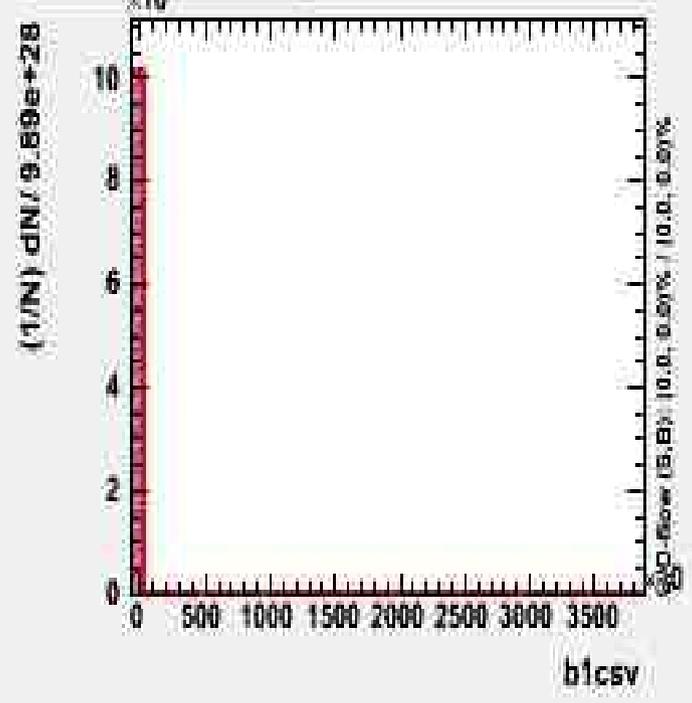
Reiezione del fondo

Dopo la ricostruzione di evento, prendo la 4-pletta di massima BDT per eventi di segnale (tt semileptonico) e di fondo e confronto le variabili per definire una nuova BDT per la reiezione degli eventi di fondo.

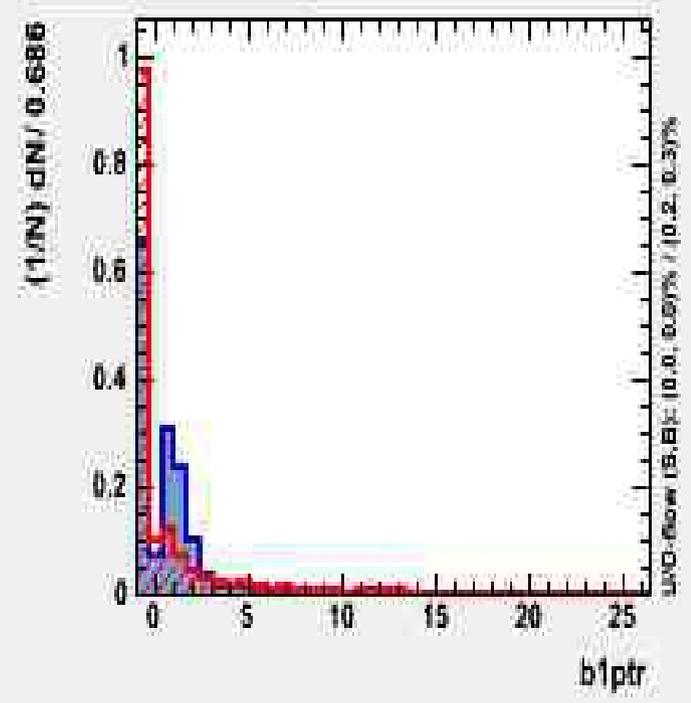
input variable: b1pt



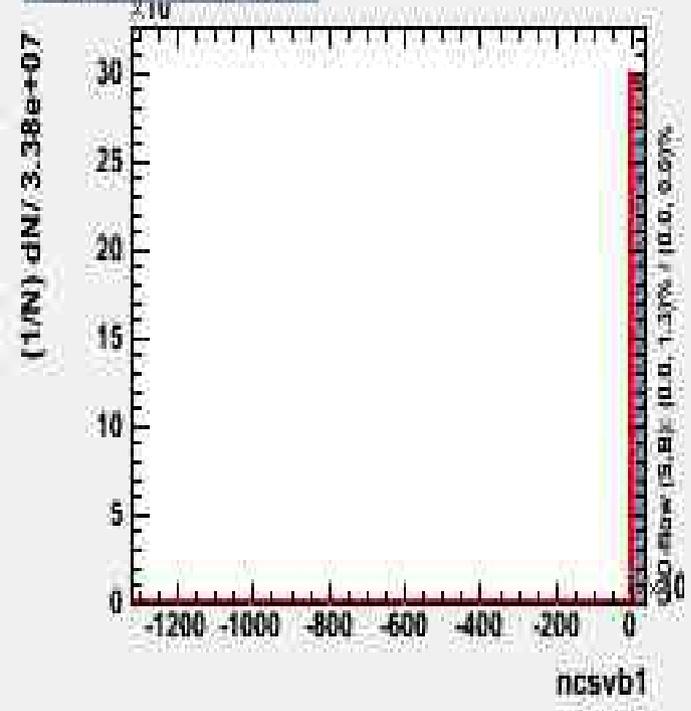
input variable: b1csv



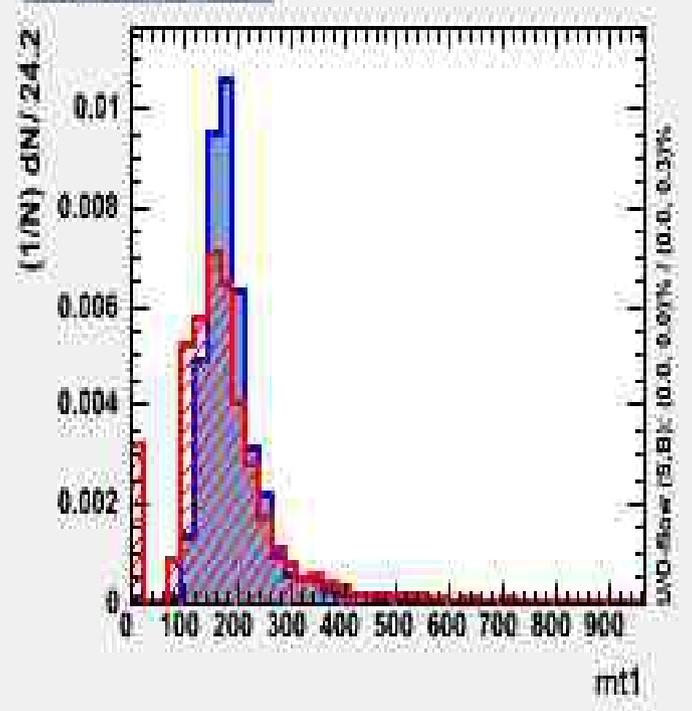
input variable: b1ptr



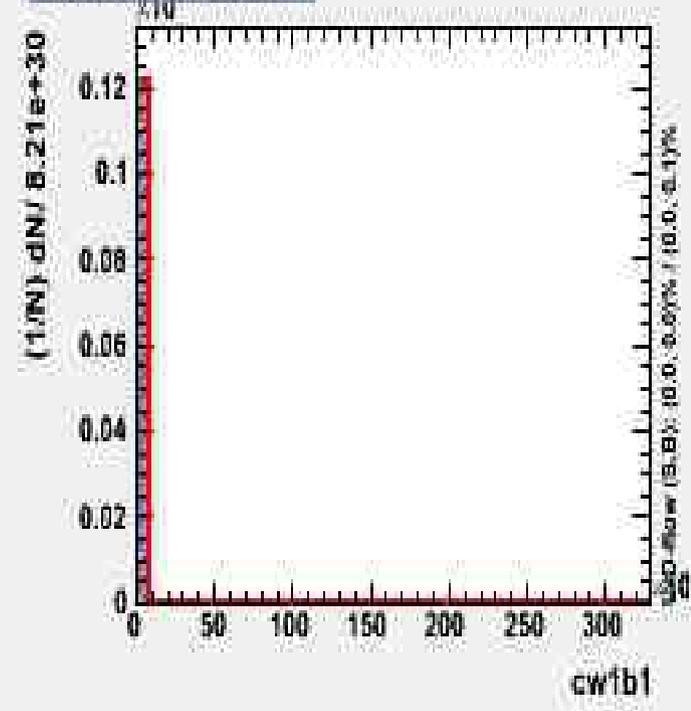
input variable: ncsvb1



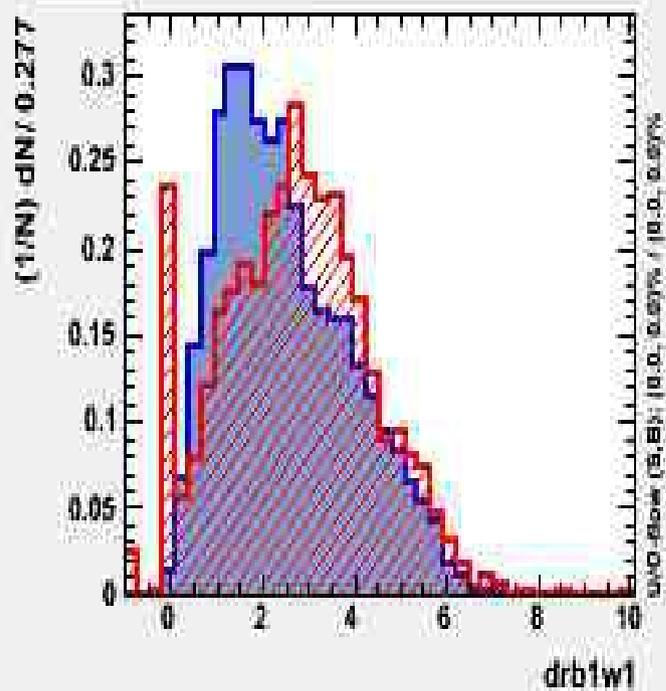
input variable: mt1



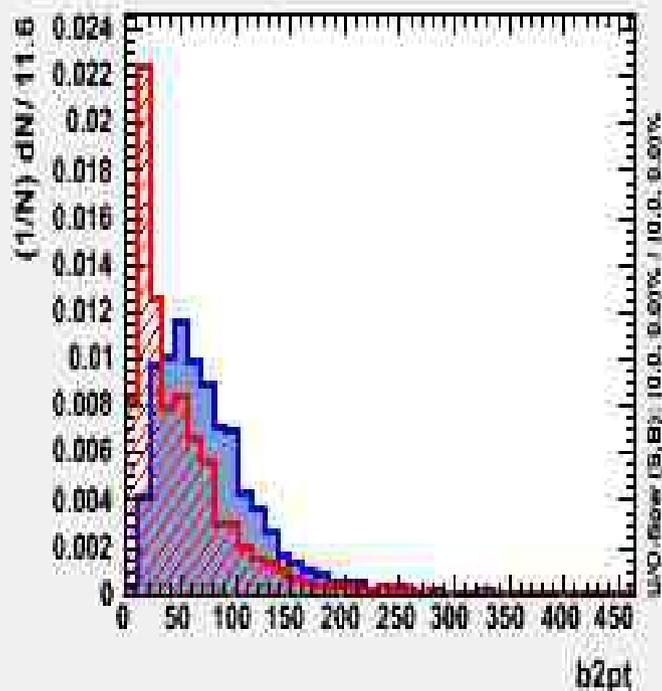
input variable: cw1b1



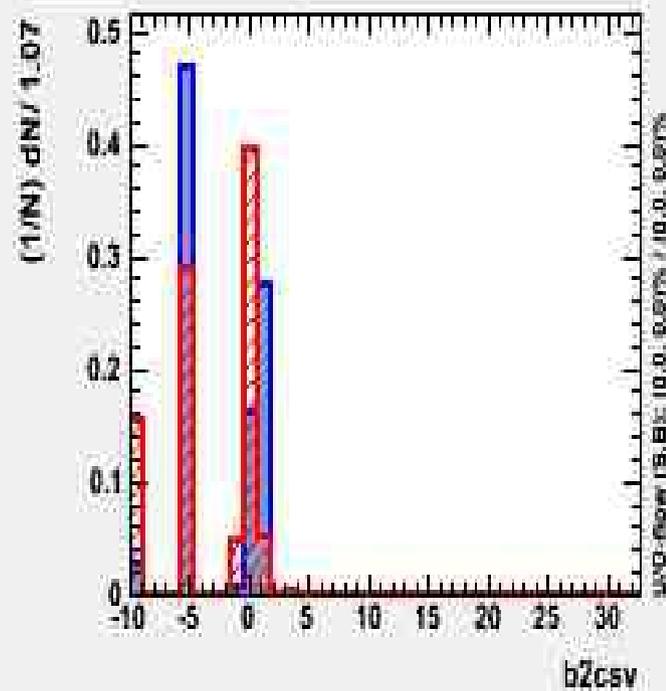
Input variable: drb1w1



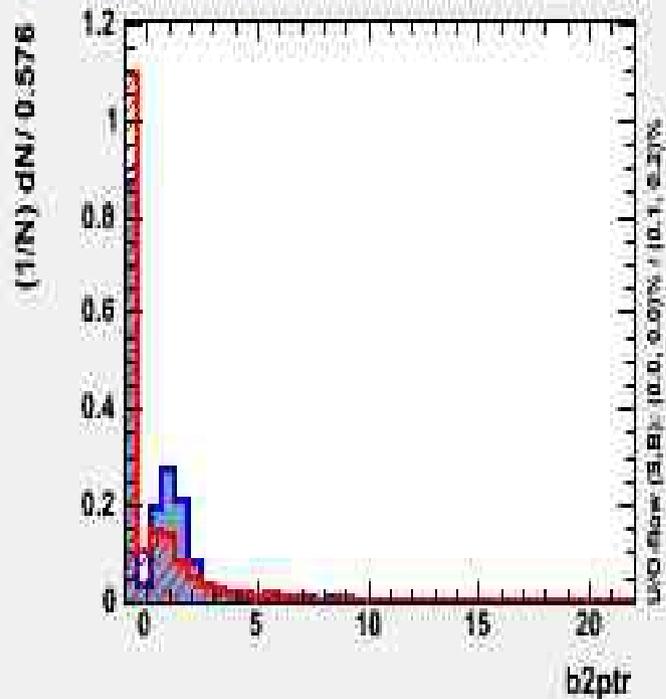
Input variable: b2pt



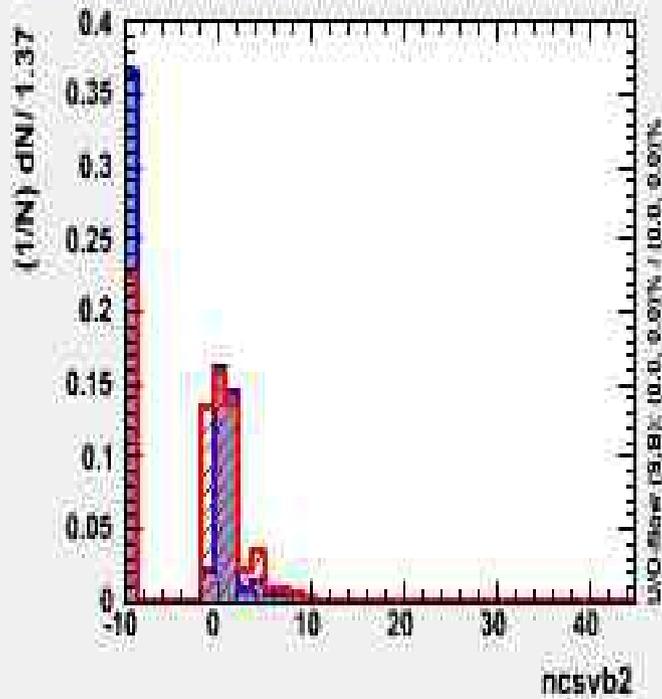
Input variable: b2csv



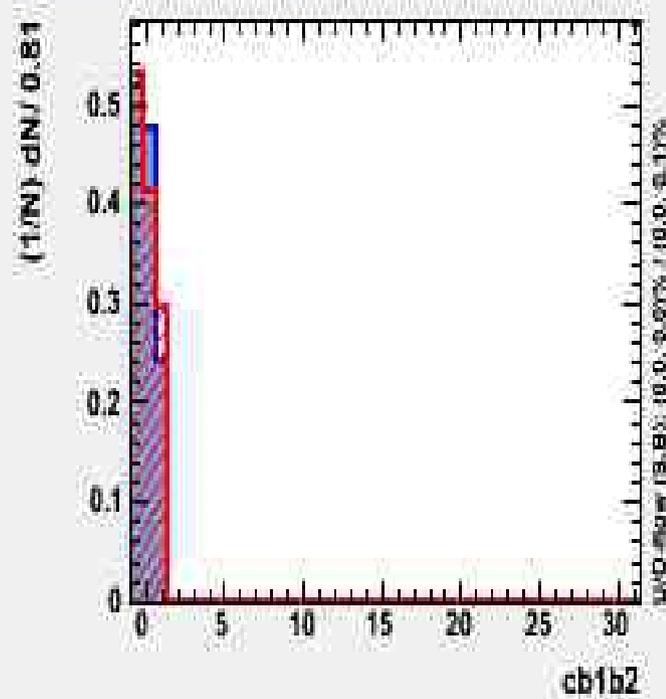
Input variable: b2ptr



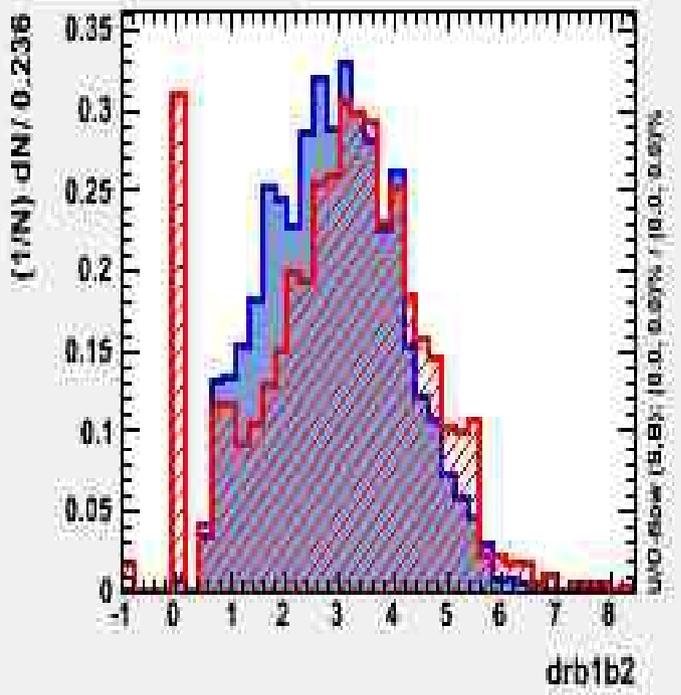
Input variable: ncsvb2



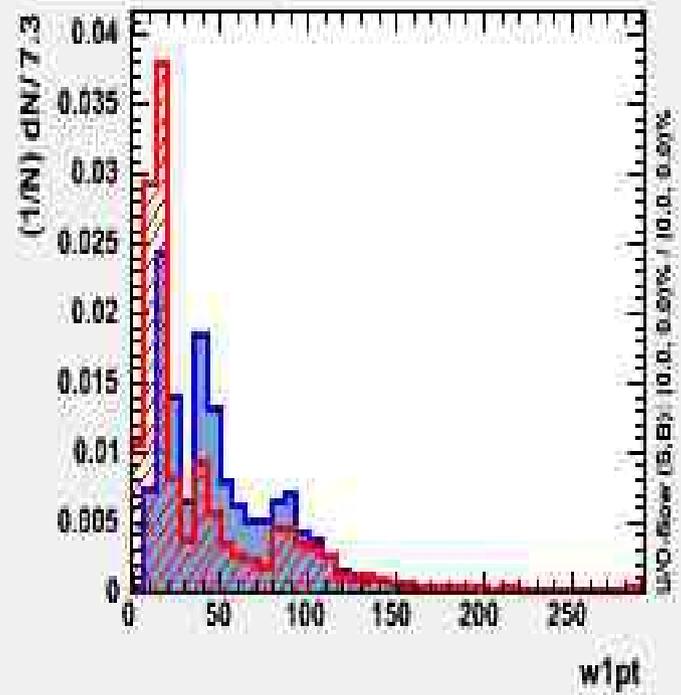
Input variable: cb1b2



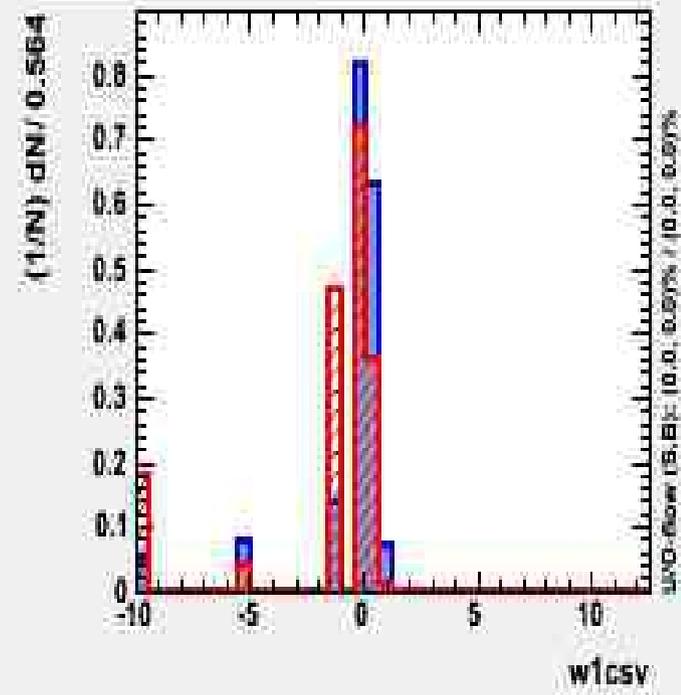
Input variable: drb1b2



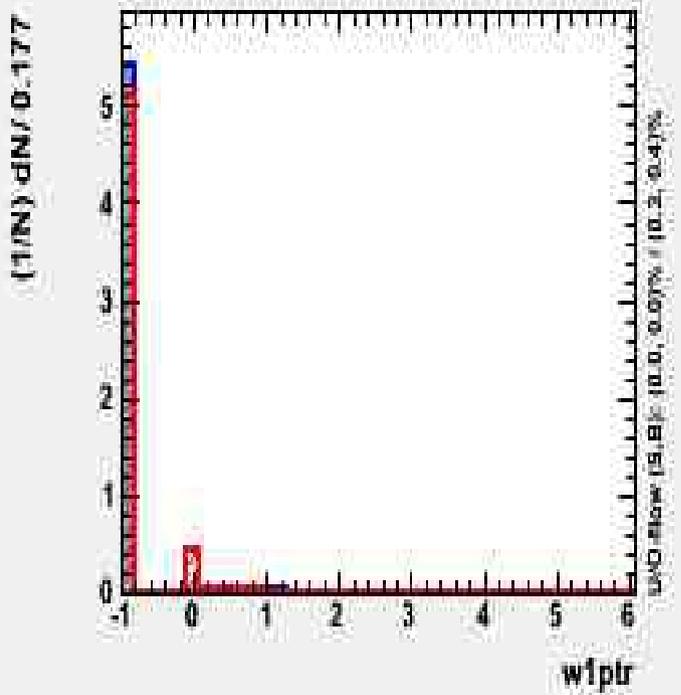
Input variable: w1pt



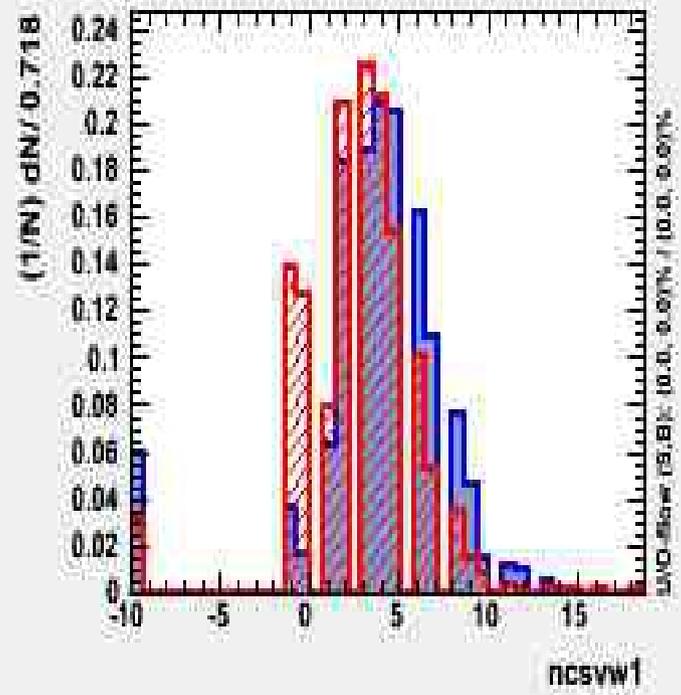
Input variable: w1csv



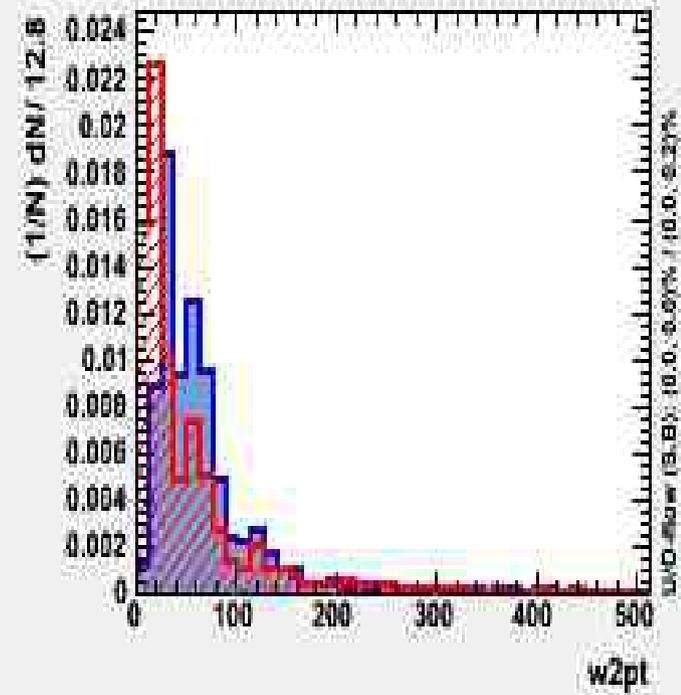
Input variable: w1ptr



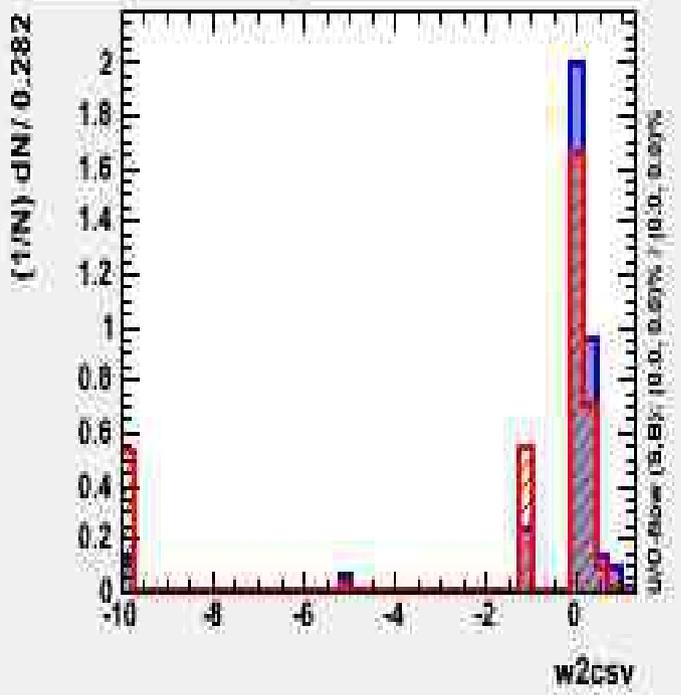
Input variable: ncsvw1



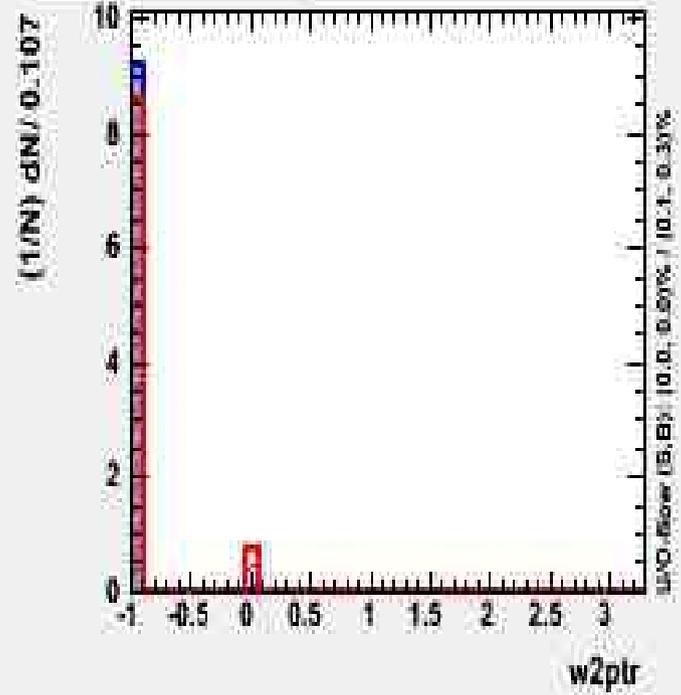
Input variable: w2pt



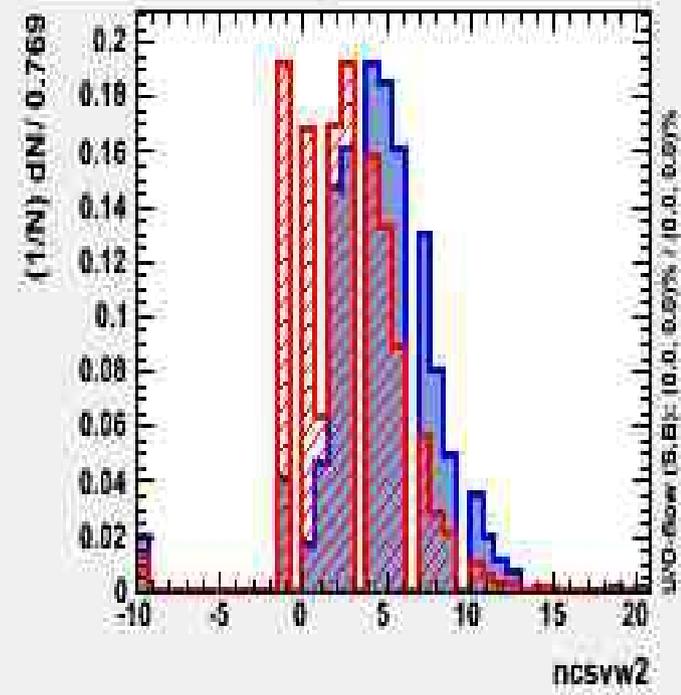
Input variable: w2csv



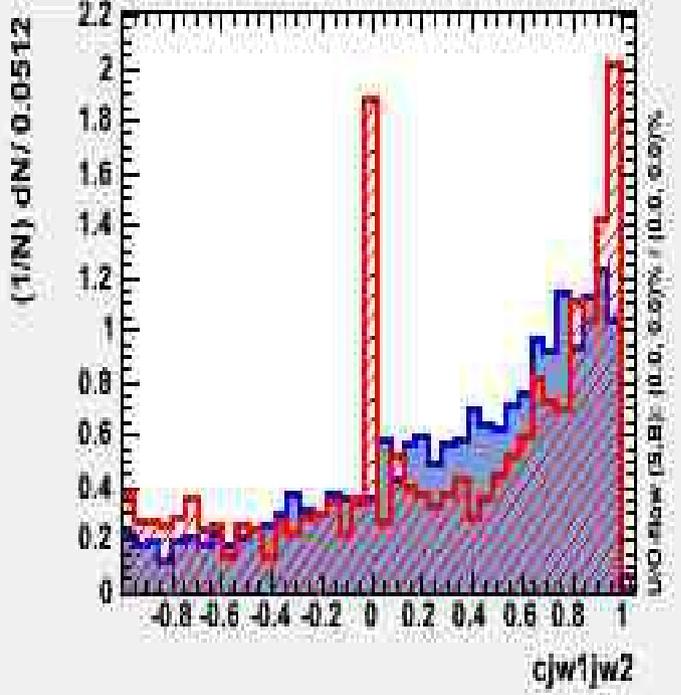
Input variable: w2ptr



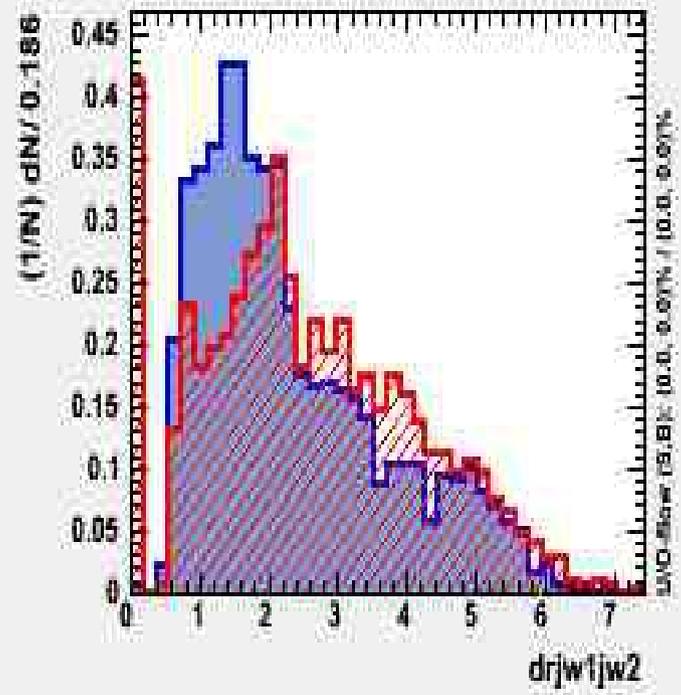
Input variable: ncsvw2



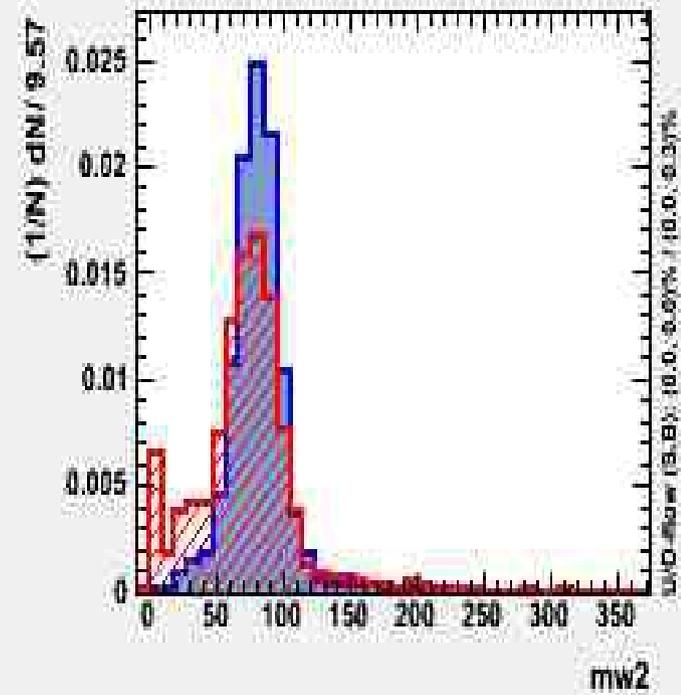
Input variable: c/w1/w2



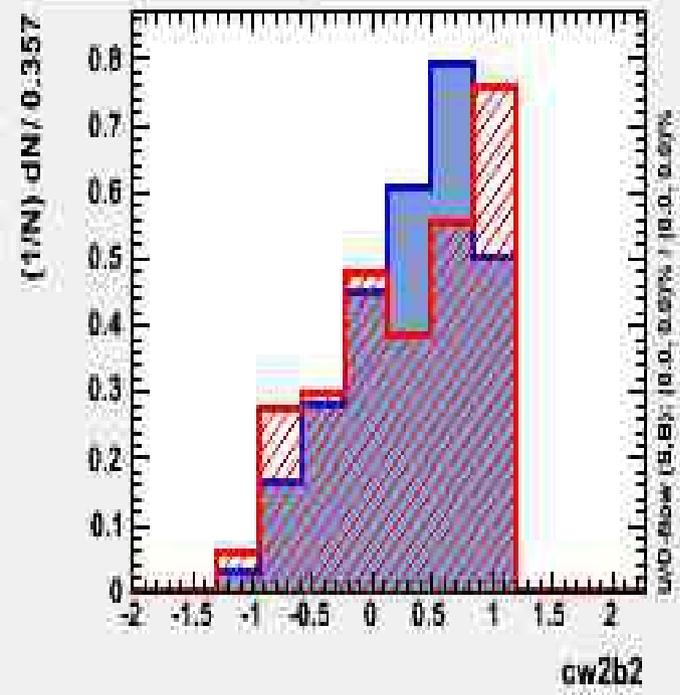
Input variable: dr/w1/w2



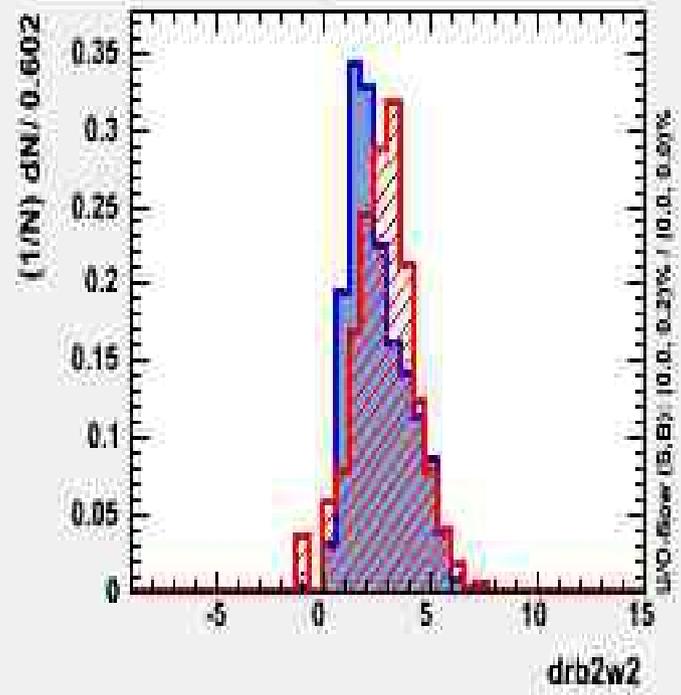
Input variable: mw2



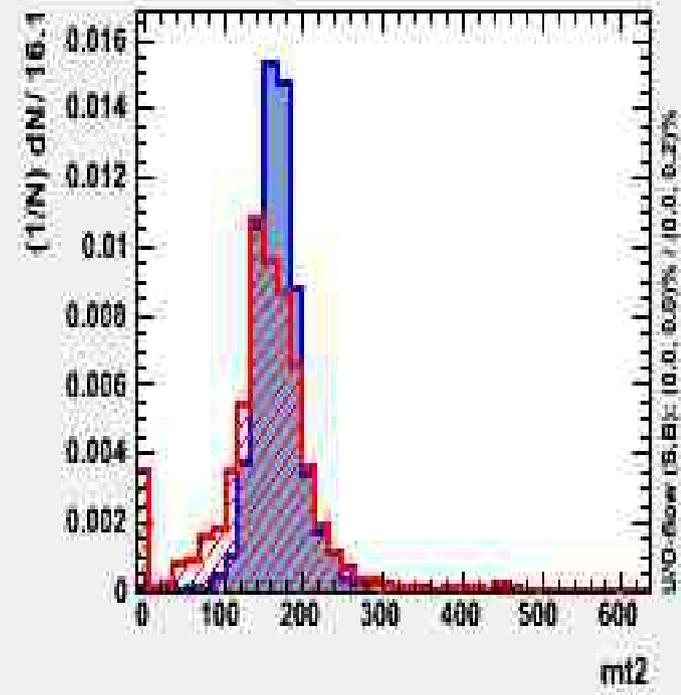
Input variable: cw2b2



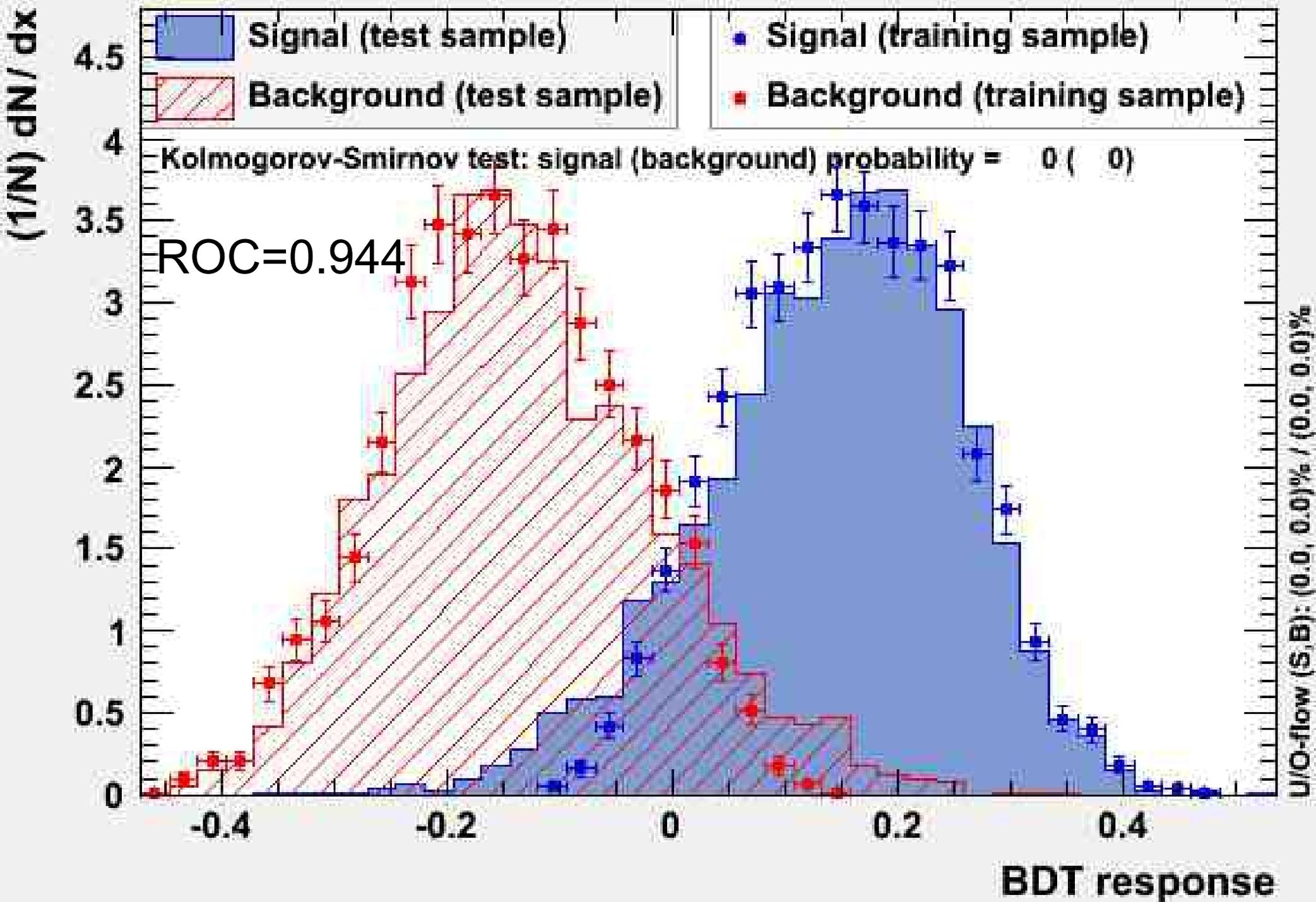
Input variable: drb2w2



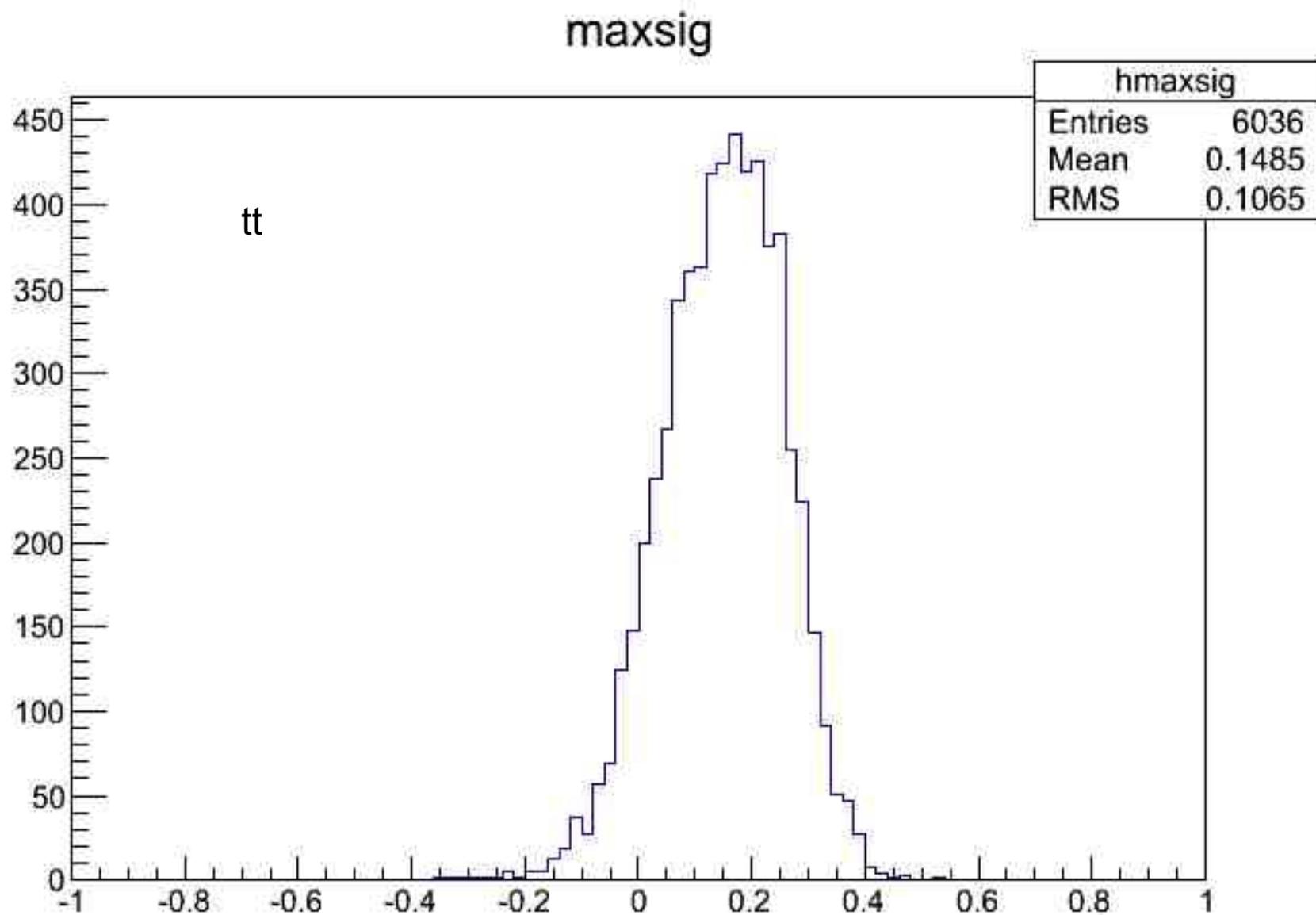
Input variable: mt2



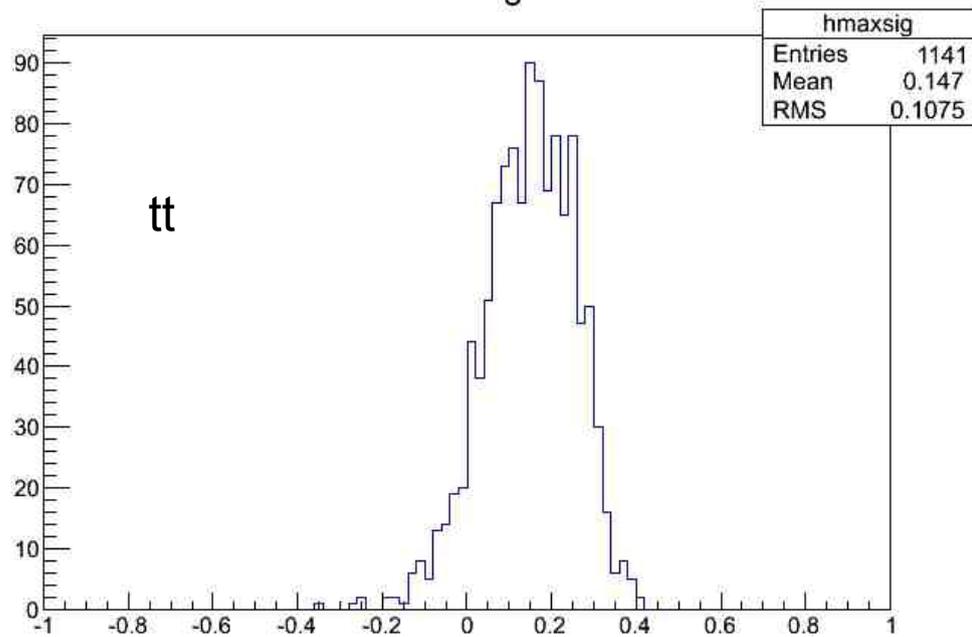
TMVA overtraining check for classifier: BDT



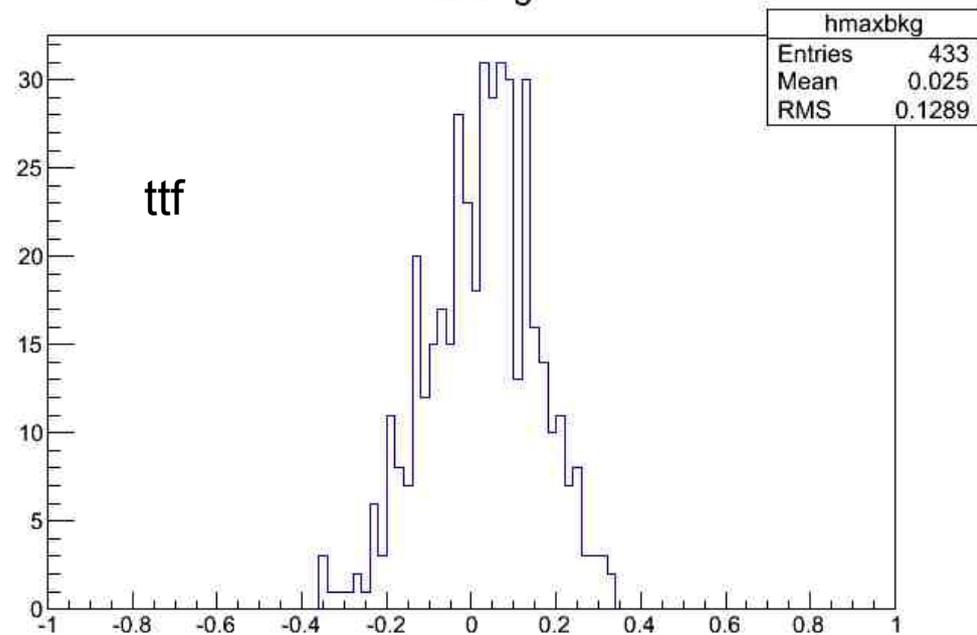
Output della BDT per la reiezione del fondo per le varie categorie



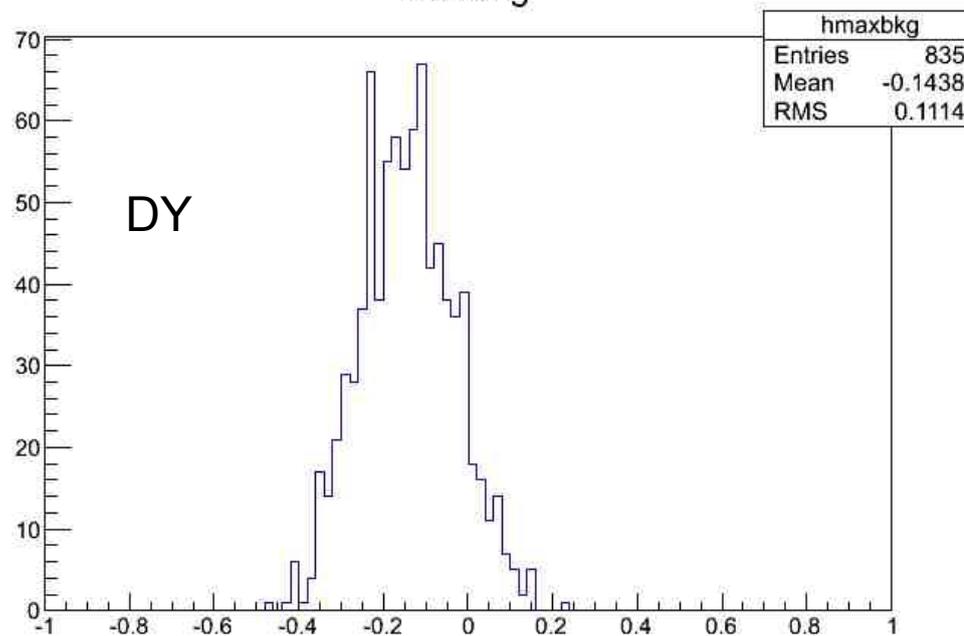
maxsig



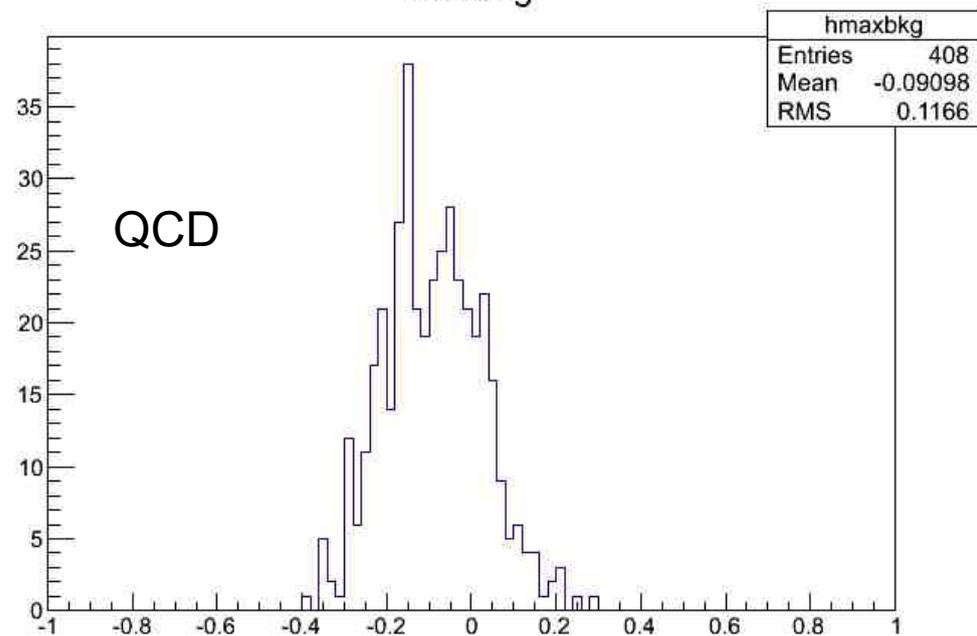
maxbkg



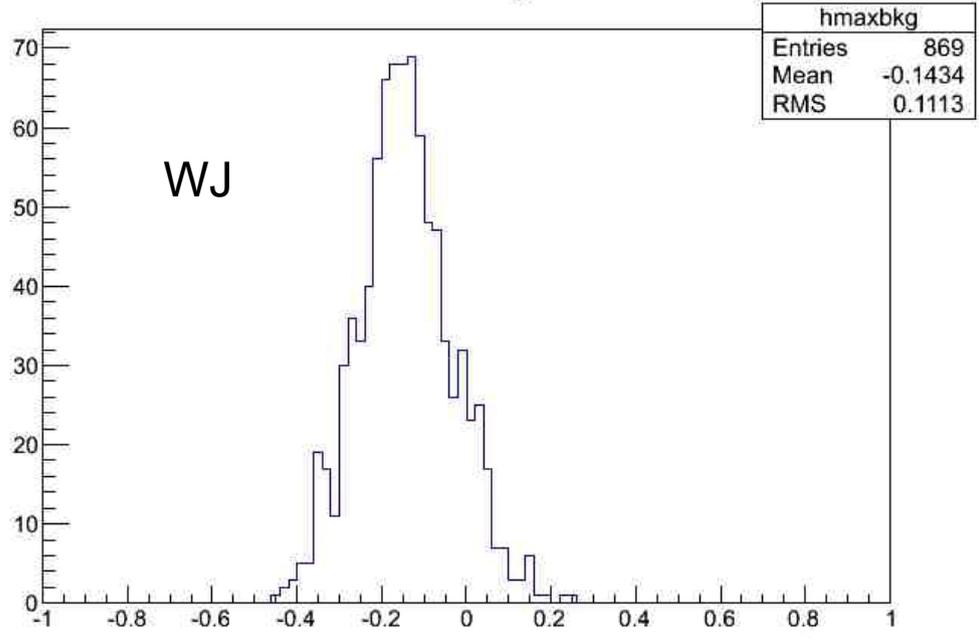
maxbkg



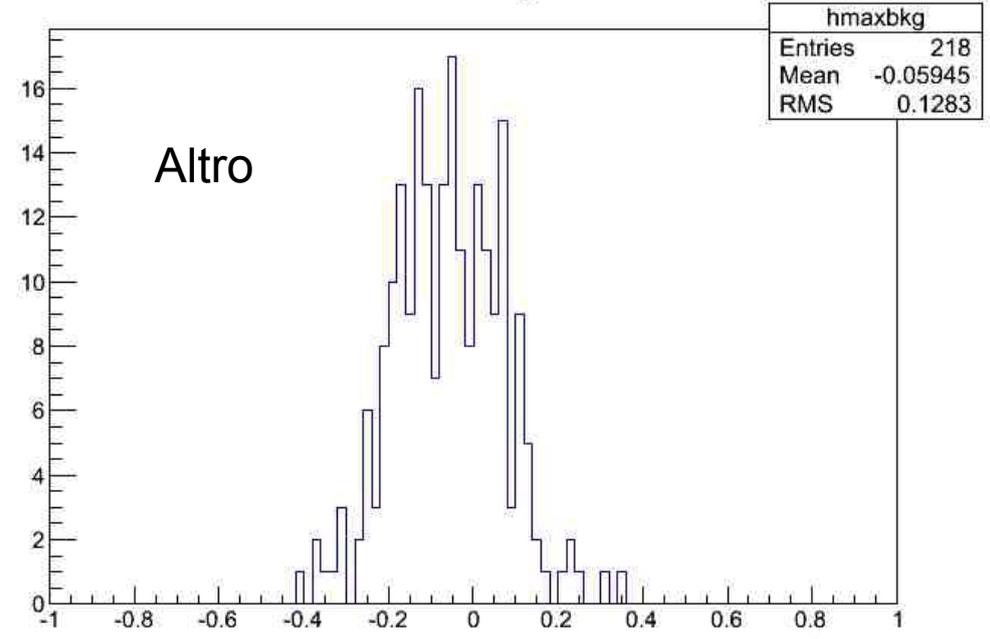
maxbkg



maxbkg



maxbkg



Reiezione fondi

	Rico	B>0	B>0.04	E0	E004	F	F0	F004
TtSL	1141	1047	965	91.8 ± 0.8	84.6 ± 1.0	40.3 ± 0.8	79.3 ± 1.0	85.8 ± 0.9
TtFL	433	259	210	59.8 ± 2.4	48.5 ± 2.4			
DY	835	79	45	9.5 ± 1.0	5.4 ± 0.8	21.4 ± 0.7	4.8 ± 0.5	3.3 ± 0.5
QCD	408	93	52	22.8 ± 2.1	12.7 ± 1.7	10.5 ± 0.5	5.6 ± 0.6	3.8 ± 0.5
Wjets	869	95	47	10.9 ± 1.1	5.4 ± 0.8	22.3 ± 0.7	5.8 ± 0.6	3.4 ± 0.5
Altro	218	74	50	33.9 ± 3.2	22.9 ± 2.8	5.6 ± 0.4	4.5 ± 0.5	3.7 ± 0.5

Nel seguito uso il taglio $B > 0$

Efficienza ttSL+ttFL

Rispetto alle entries iniziali $60.8 \pm 1.2\%$

Rispetto agli eventi nell'Ntupla $55.5 \pm 1.1\%$

Da controllare i tagli iniziali

Assegnazione del Top padre per il leptone da B da verità MC

Come leptoni da B prendo solo i muoni.

Il top padre del muone da B si può ottenere dalla verità MC risalendo dal muone o risalendo dal partone che ha originato il jet a cui il muone appartiene.

I risultati differiscono nel $6.5 \pm 0.4\%$ dei casi.

Assegnazione del Top padre da ricostruzione evento

Dopo la ricostruzione dell'evento, ordino le 4-plette in ordine decrescente di BDT.

Per ogni muone da B, vado a vedere quale e` la prima 4-pletta in cui il suo jet e` stato classificato come jet da B.

Confronto il vero top padre di quel muone (o del suo jet, che sono a volte diversi come detto prima) con il top a cui lo stesso jet e` stato associato dalla ricostruzione dell'evento.

Probabilità di giusta associazione

Top da verità MC partendo dal muone

Jet del muone assegnato al top SL = $72.9 \pm 0.9\%$

Jet del muone assegnato al top H = $73.9 \pm 0.9\%$

Media = $73.4 \pm 0.6\%$

Top da verità MC partendo dal jet

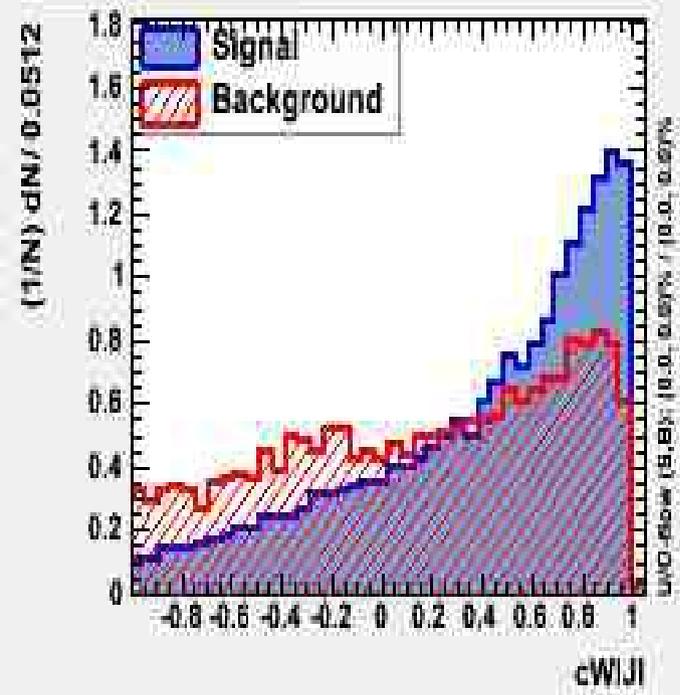
Jet del muone assegnato al top SL = $75.1 \pm 0.9\%$

Jet del muone assegnato al top H = $77.7 \pm 0.9\%$

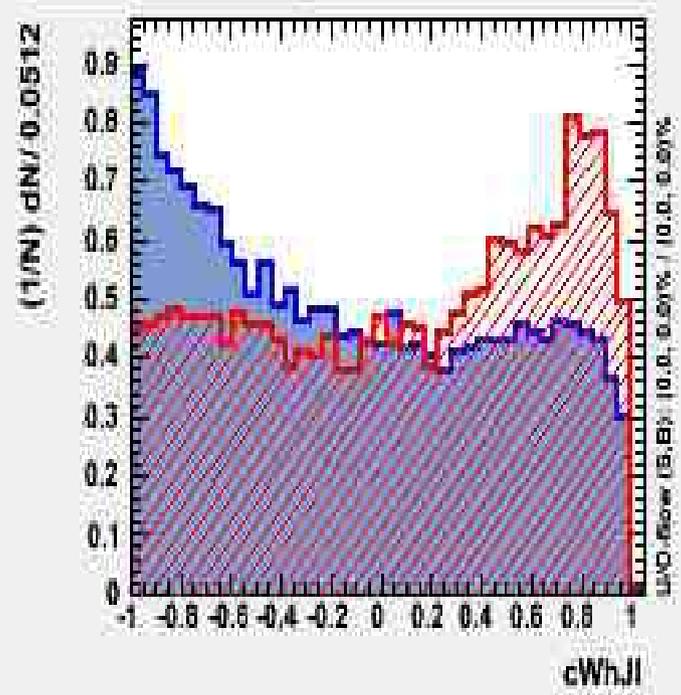
Media = $76.3 \pm 0.6\%$

Separo i muoni assegnati al top giusto e sbagliato
Attribuzione al top SL

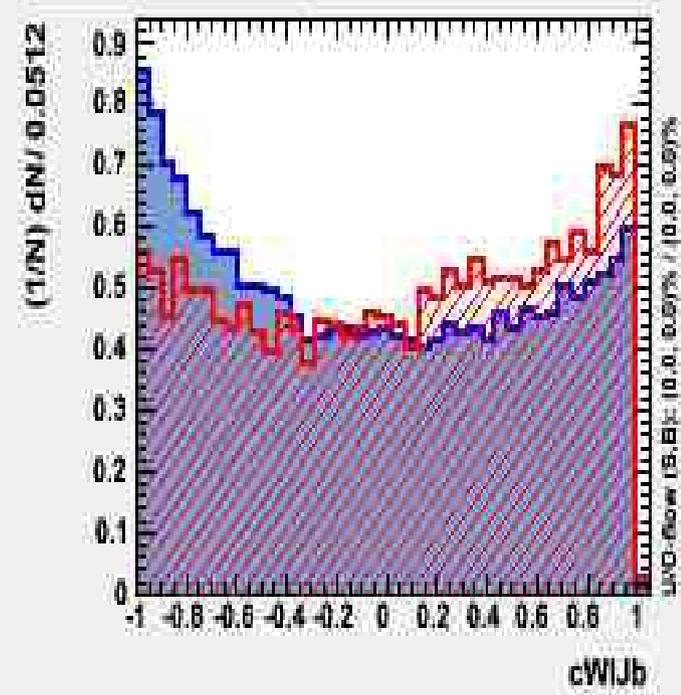
Input variable: cWlJl



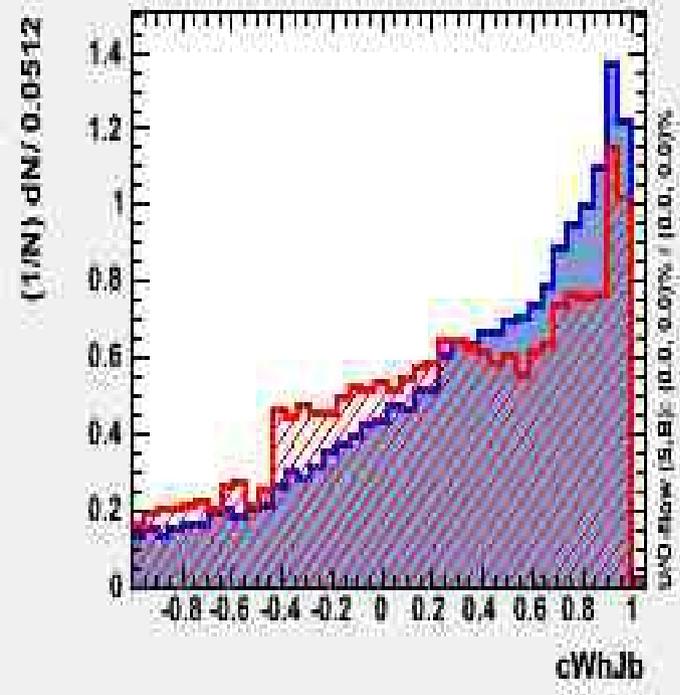
Input variable: cWhJl



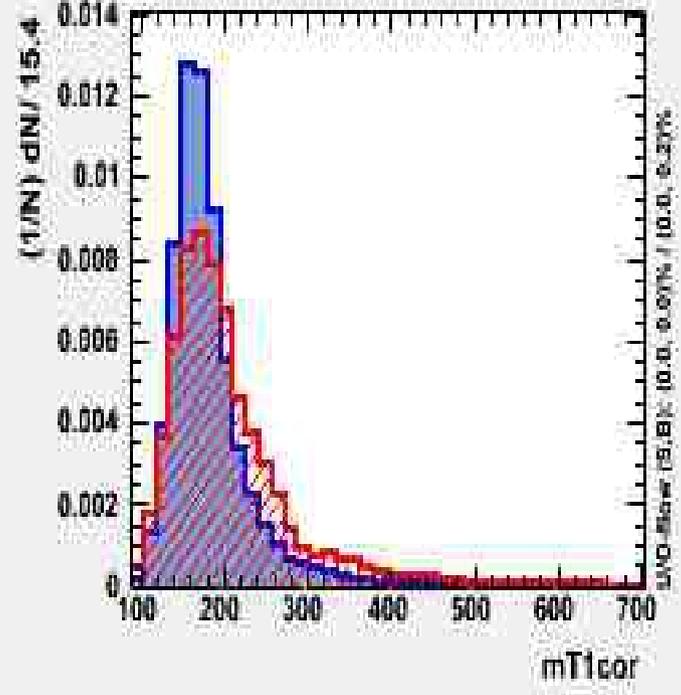
Input variable: cWlJb



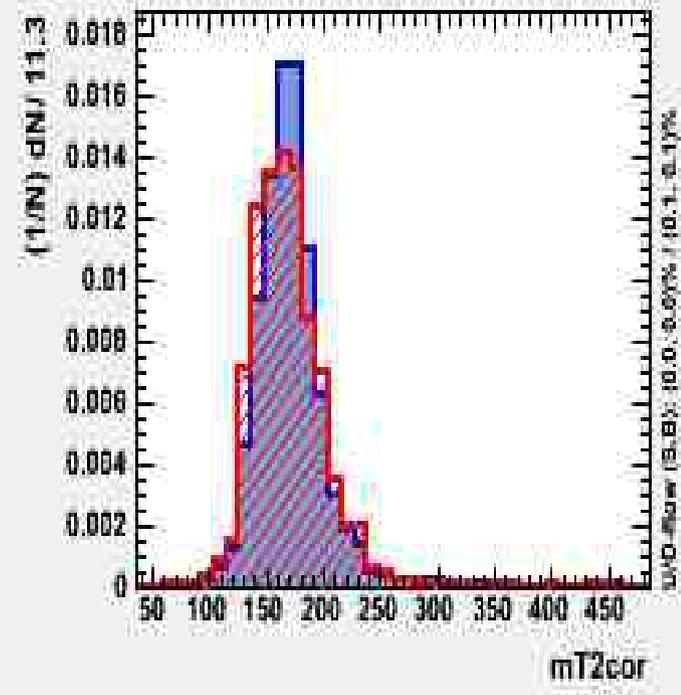
Input variable: cWhJb



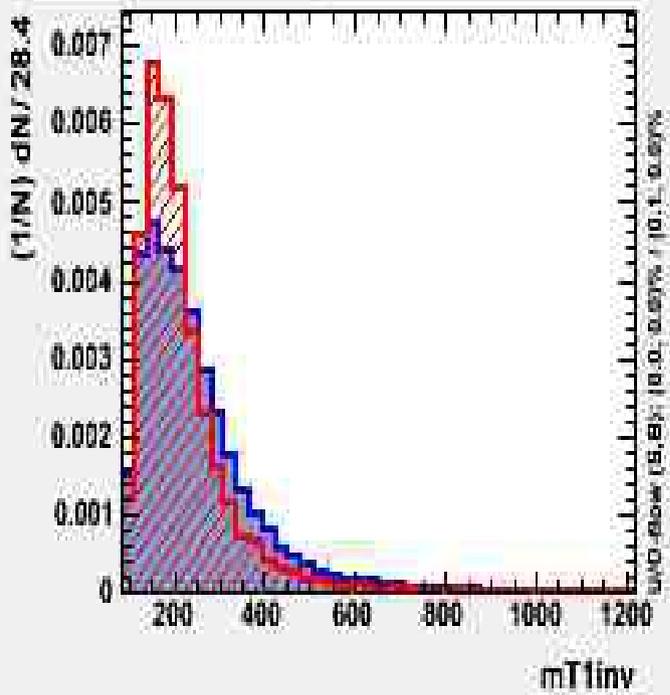
Input variable: mT1cor



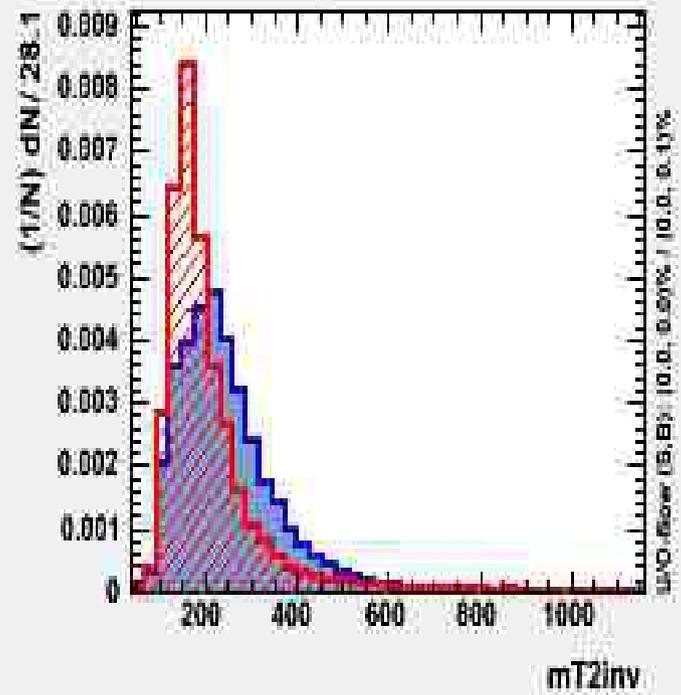
Input variable: mT2cor



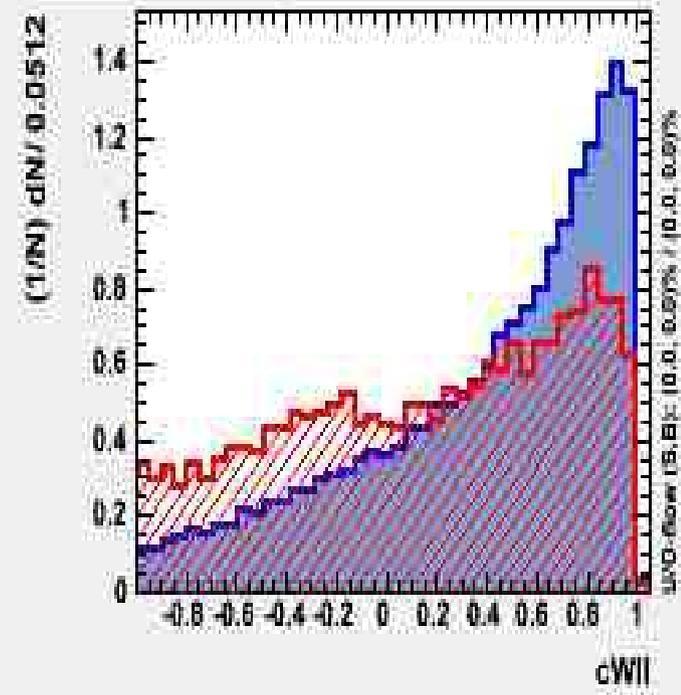
Input variable: mT1inv



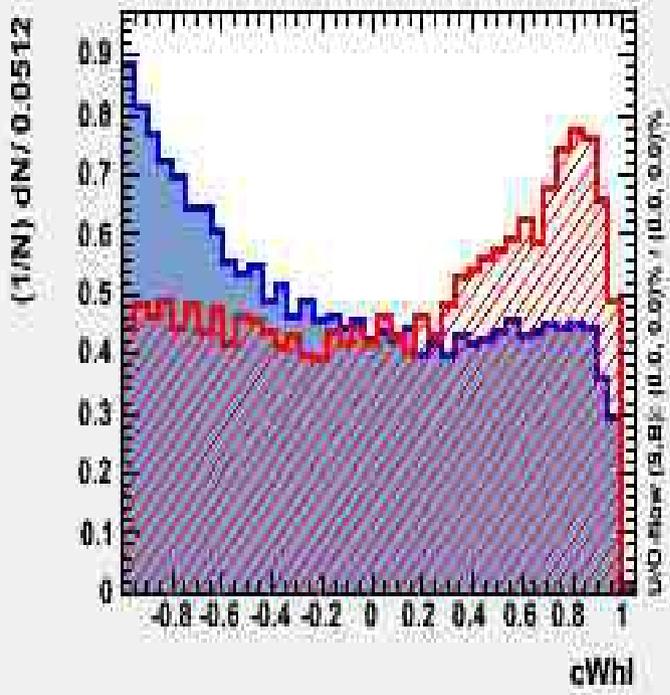
Input variable: mT2inv



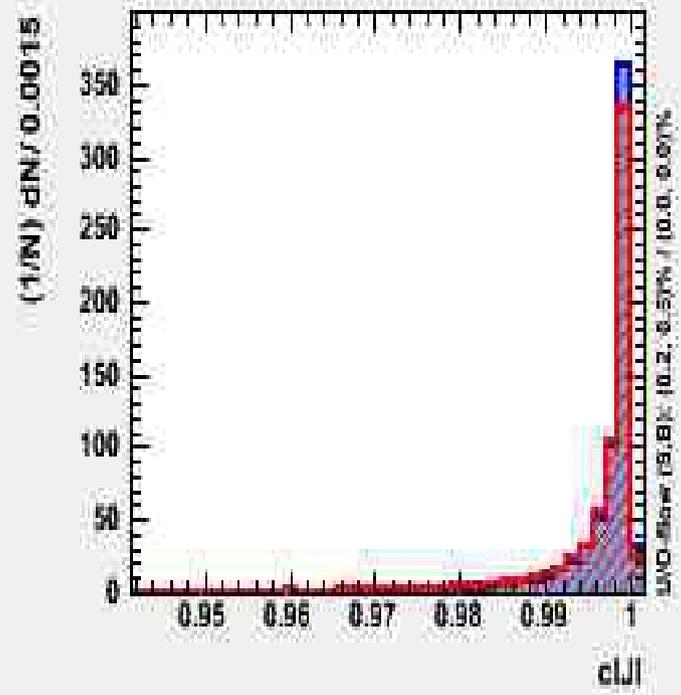
Input variable: cWll



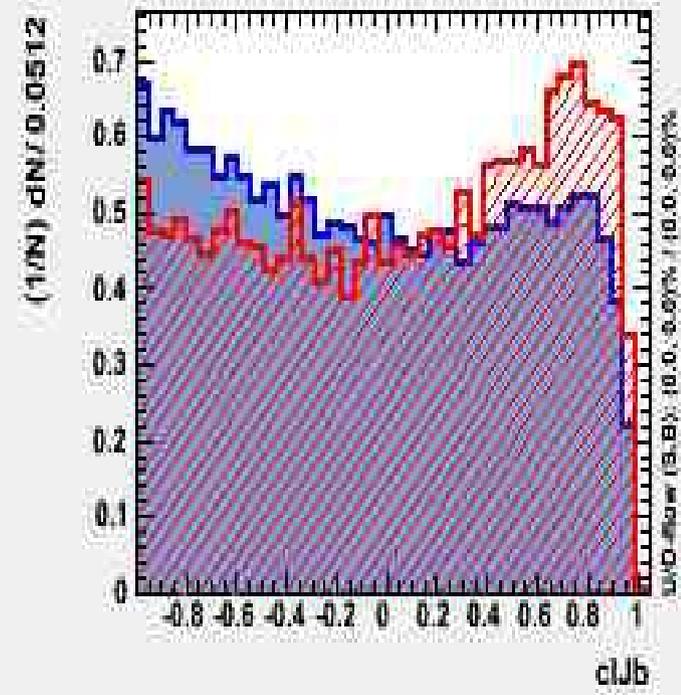
Input variable: cWhl



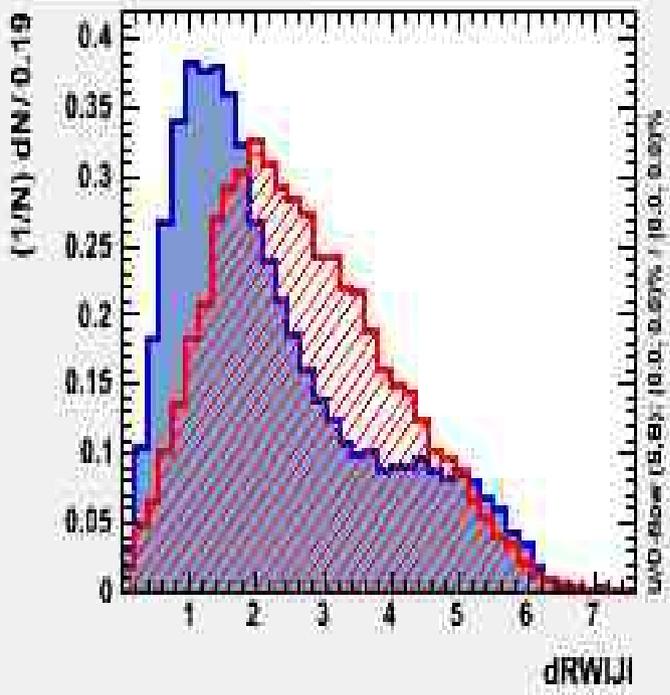
Input variable: cJl



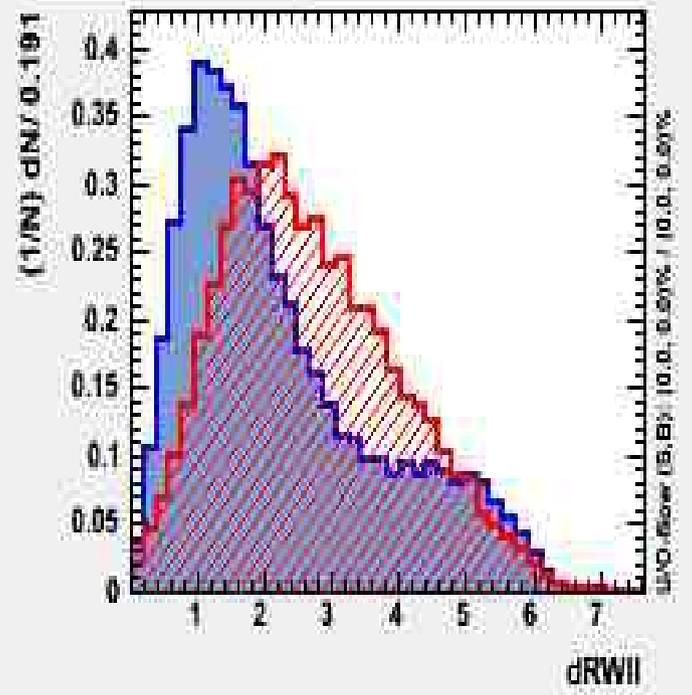
Input variable: cJb



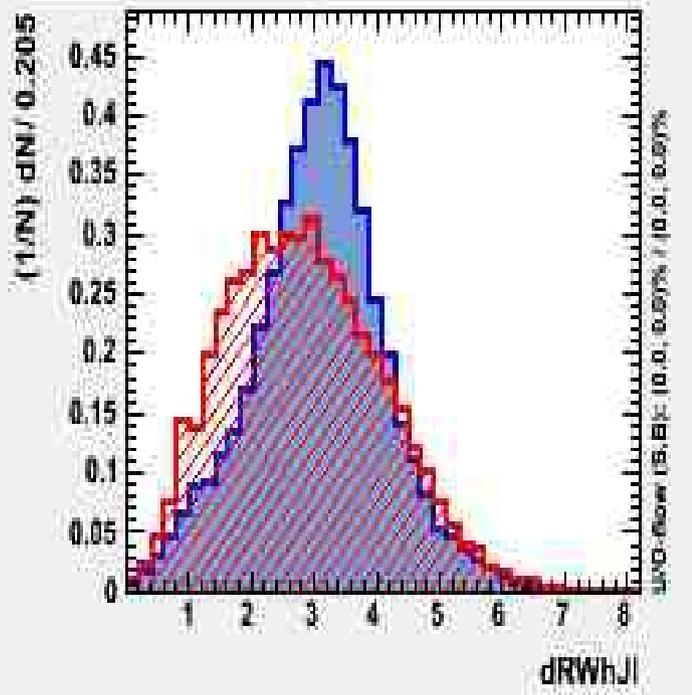
Input variable: dRWIjI



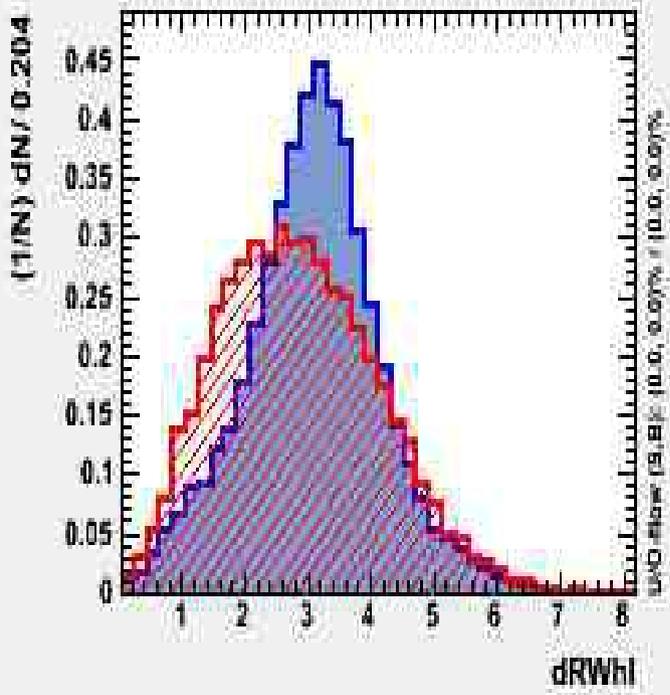
Input variable: dRWIj



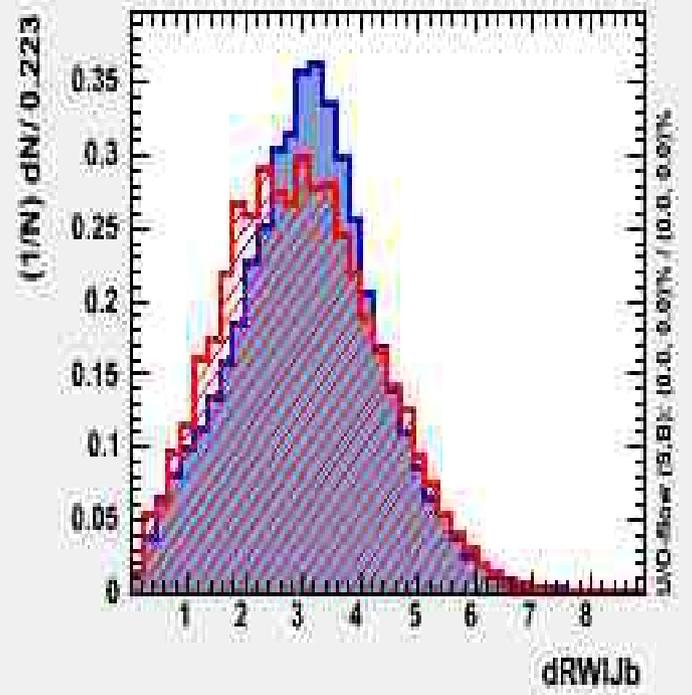
Input variable: dRWWhJ



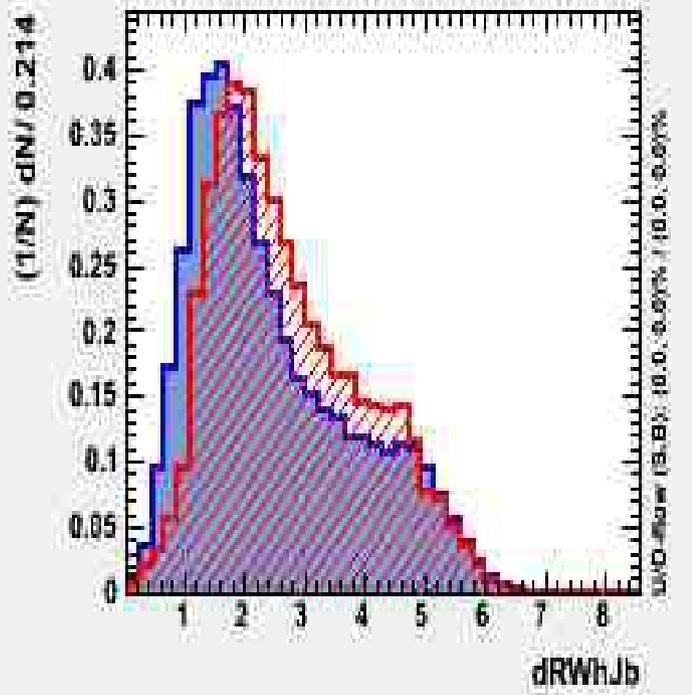
Input variable: dRWWhI



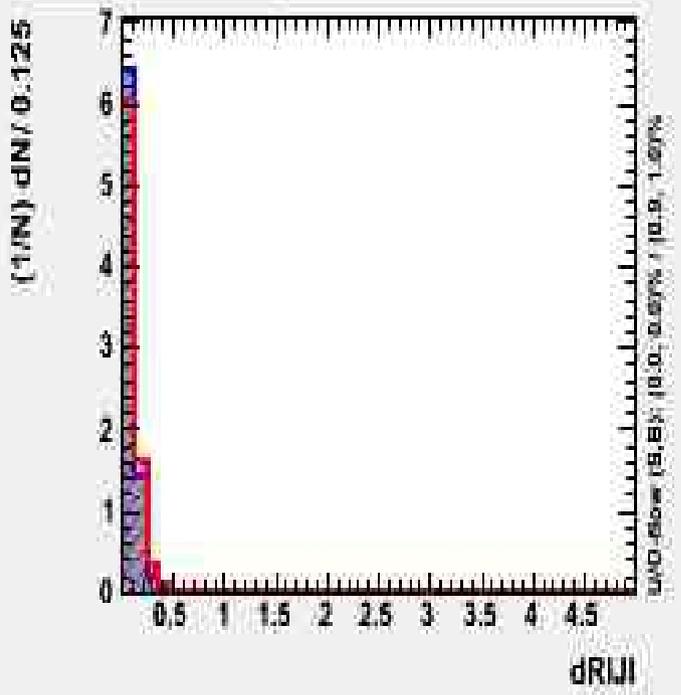
Input variable: dRWWhb



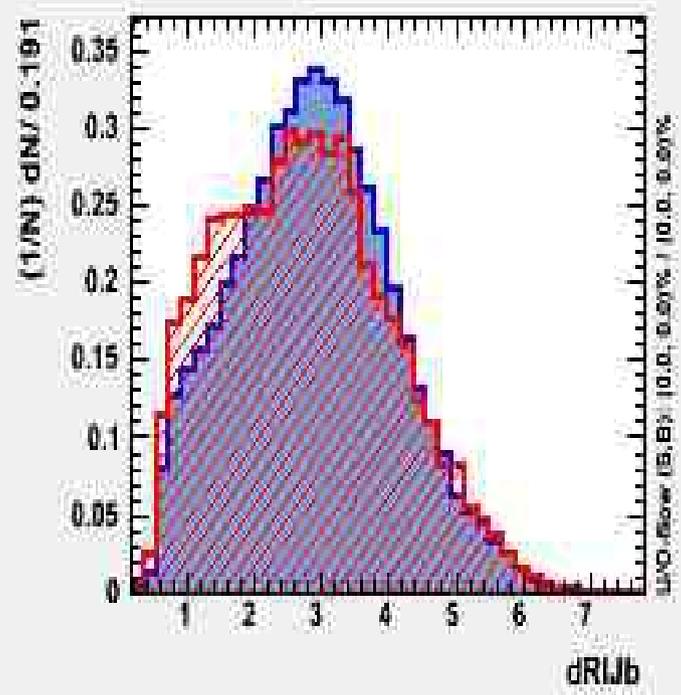
Input variable: dRWWhJb



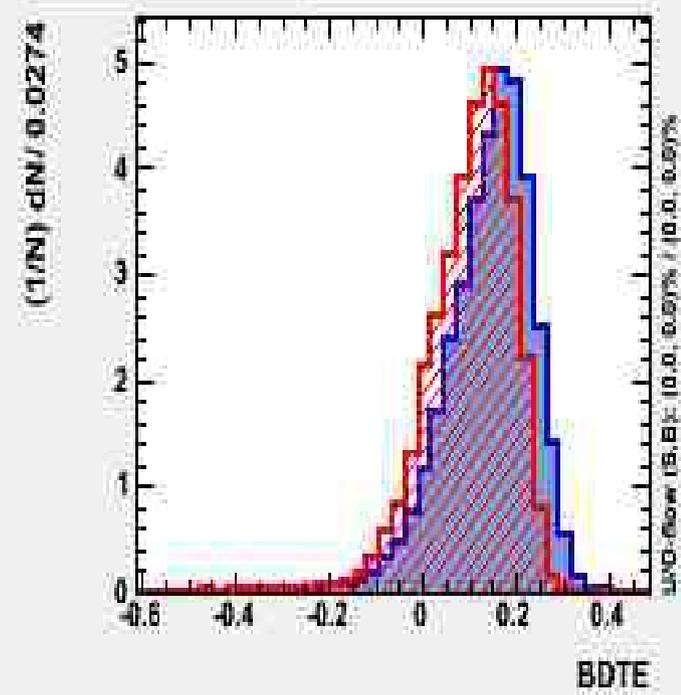
Input variable: dRIJl



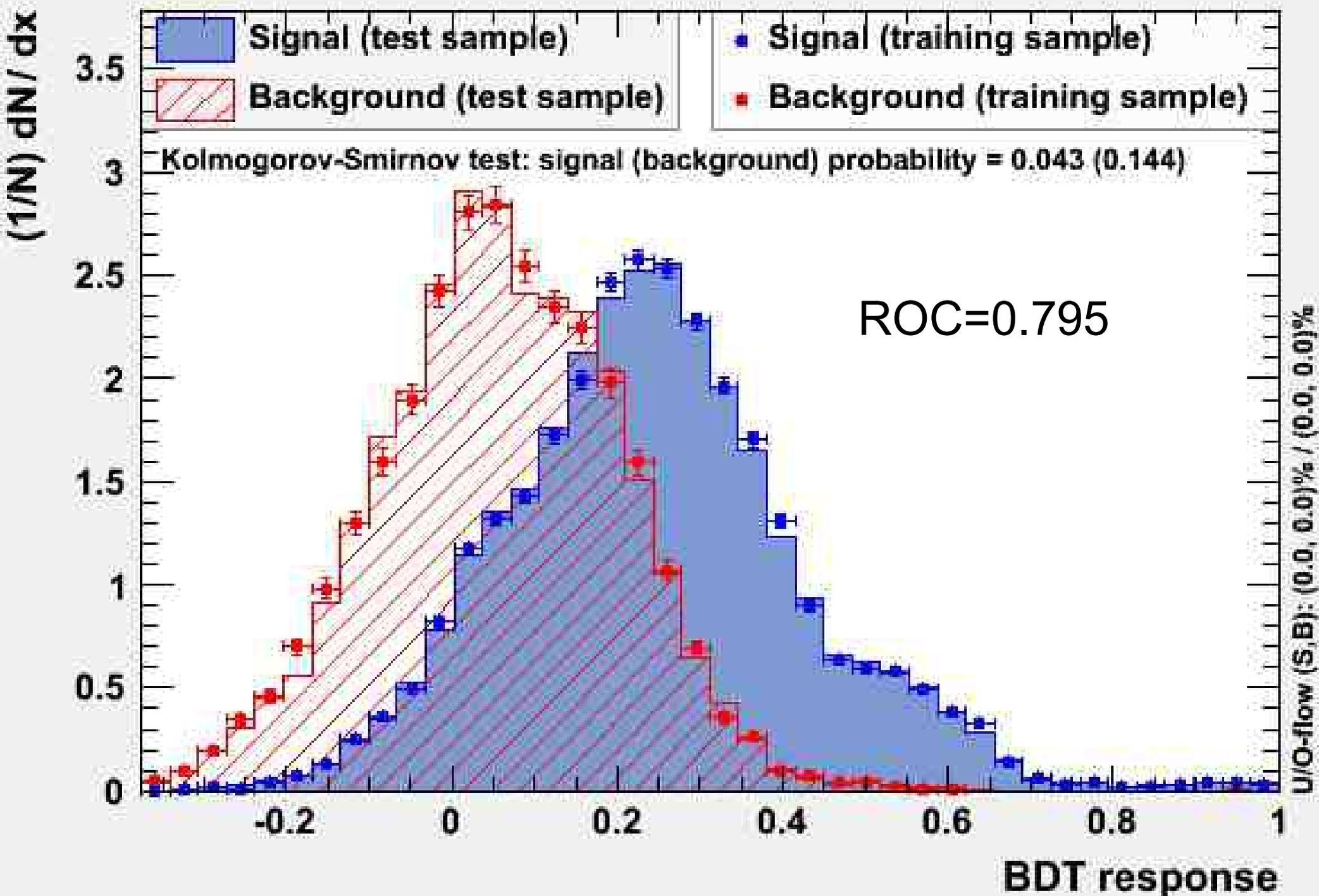
Input variable: dRIJb



Input variable: BDTE

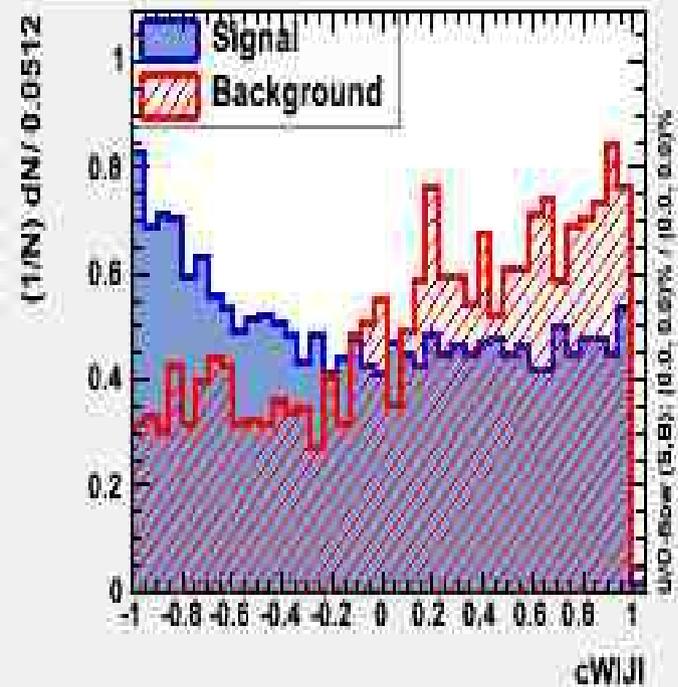


TMVA overtraining check for classifier: BDT

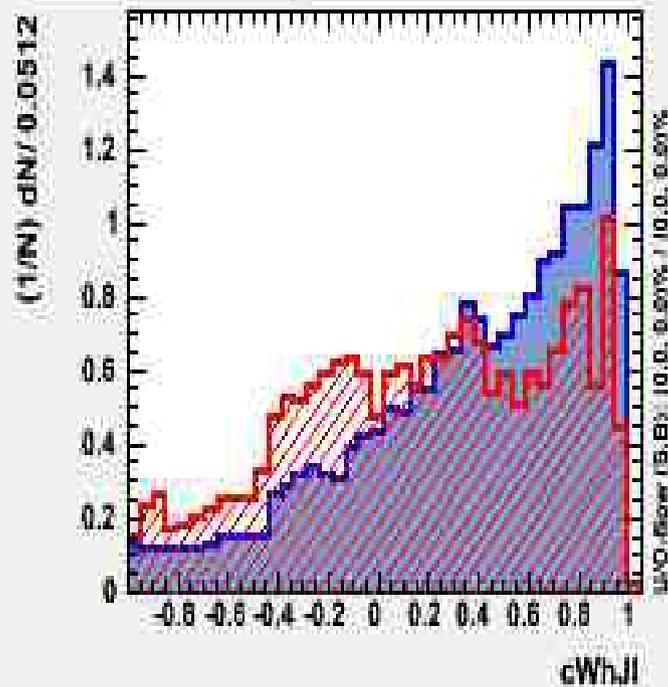


Separo i muoni assegnati al top giusto e sbagliato
Attribuzione al top H

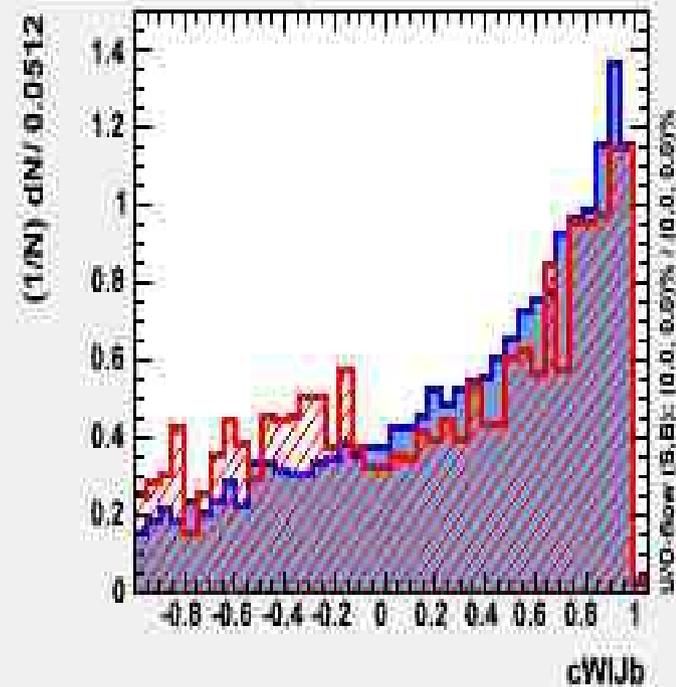
Input variable: cWlJl



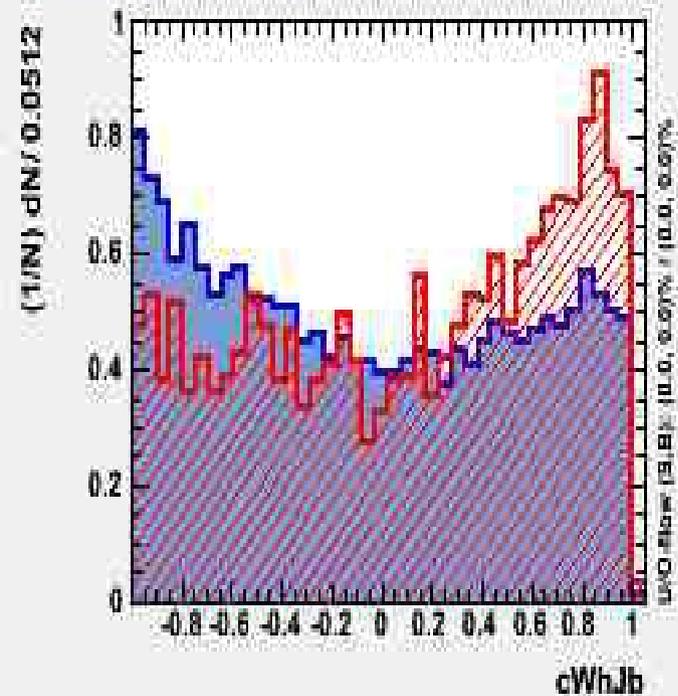
Input variable: cWhJl



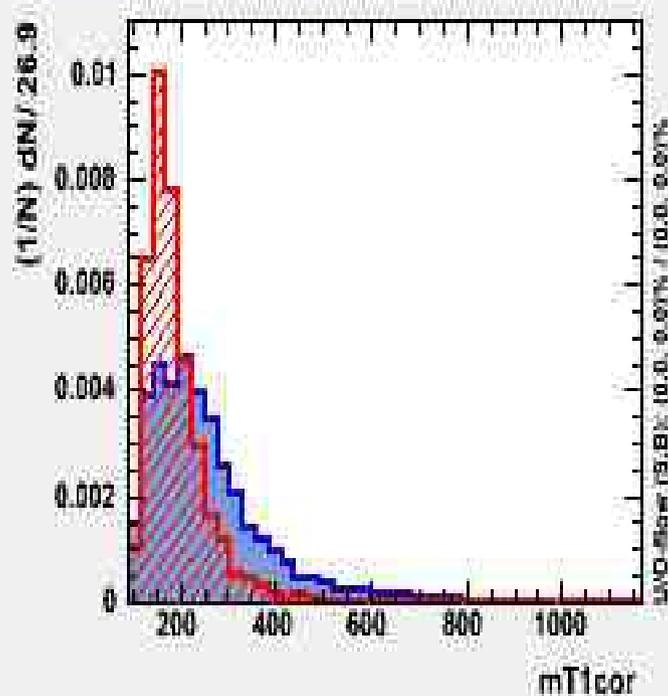
Input variable: cWlJb



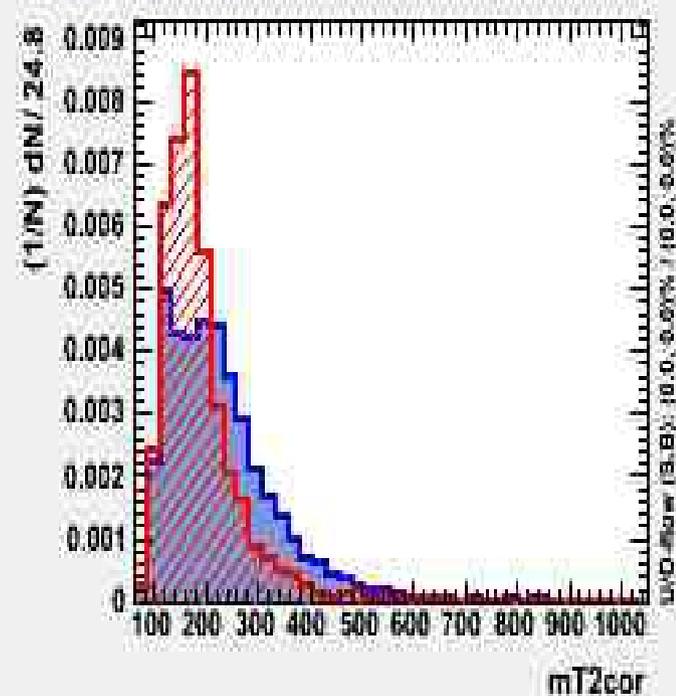
Input variable: cWhJb



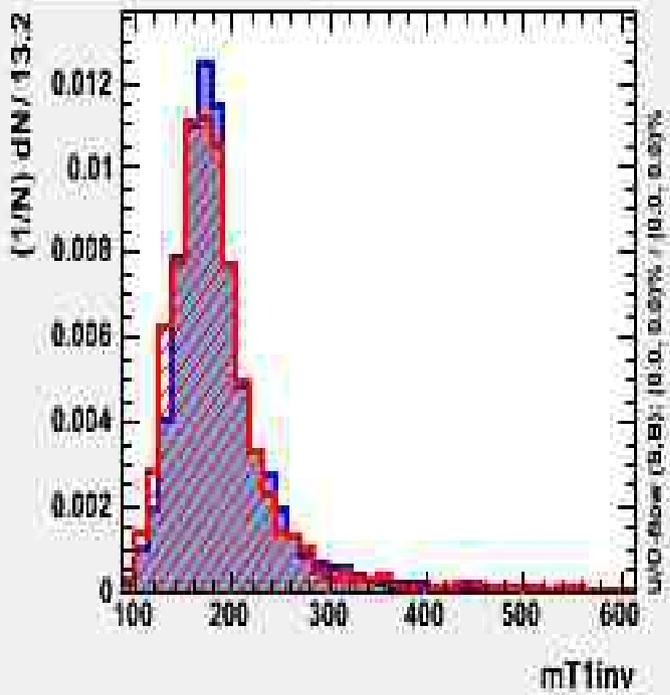
Input variable: mT1cor



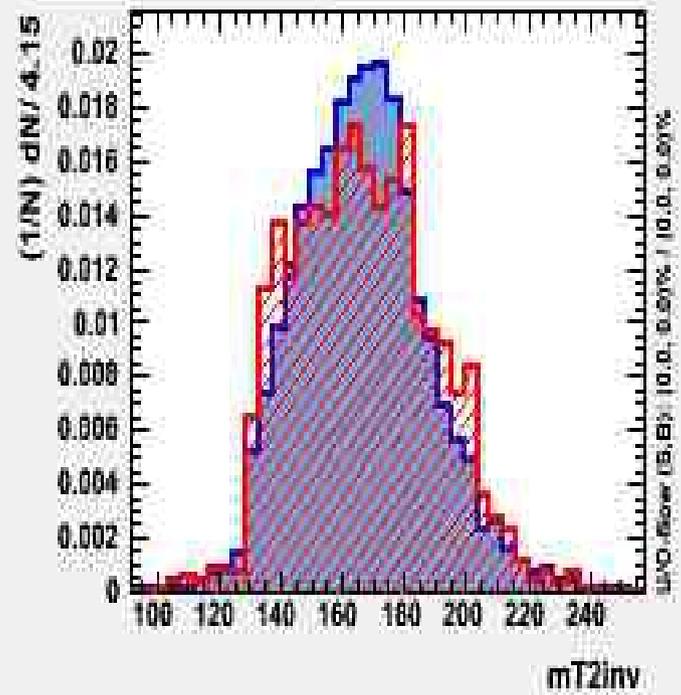
Input variable: mT2cor



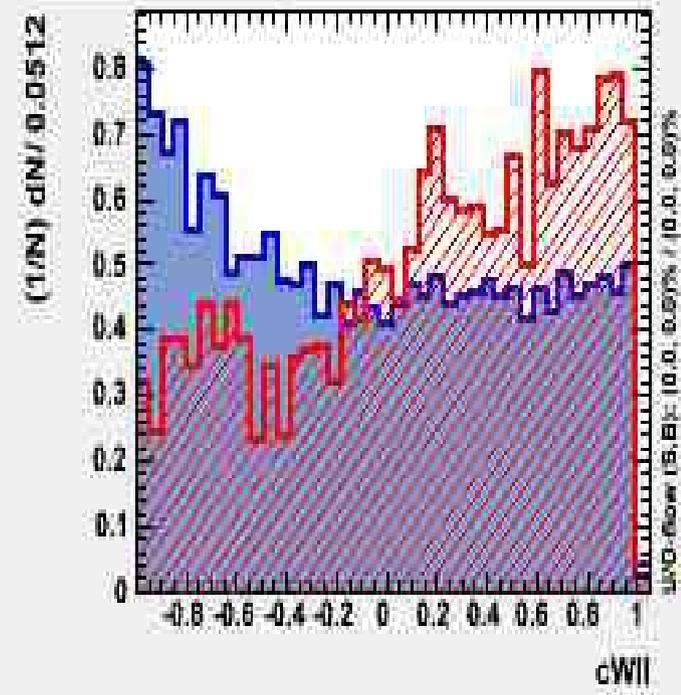
Input variable: mT1inv



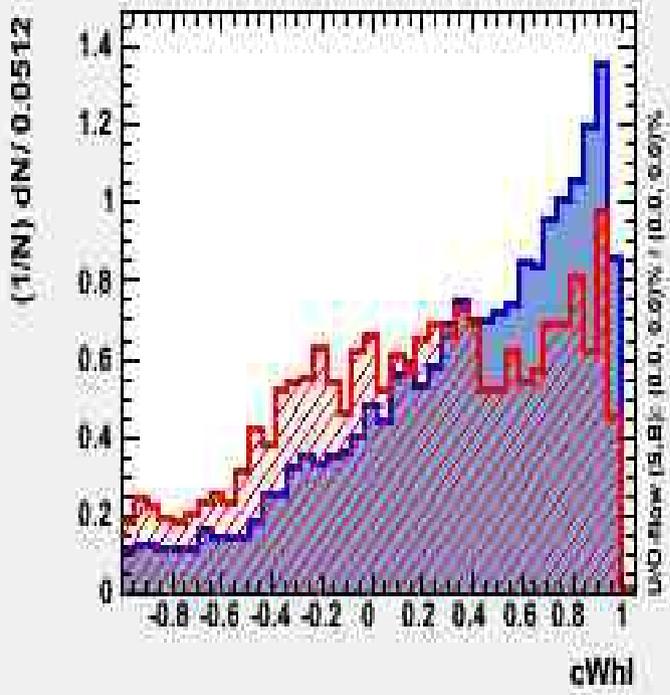
Input variable: mT2inv



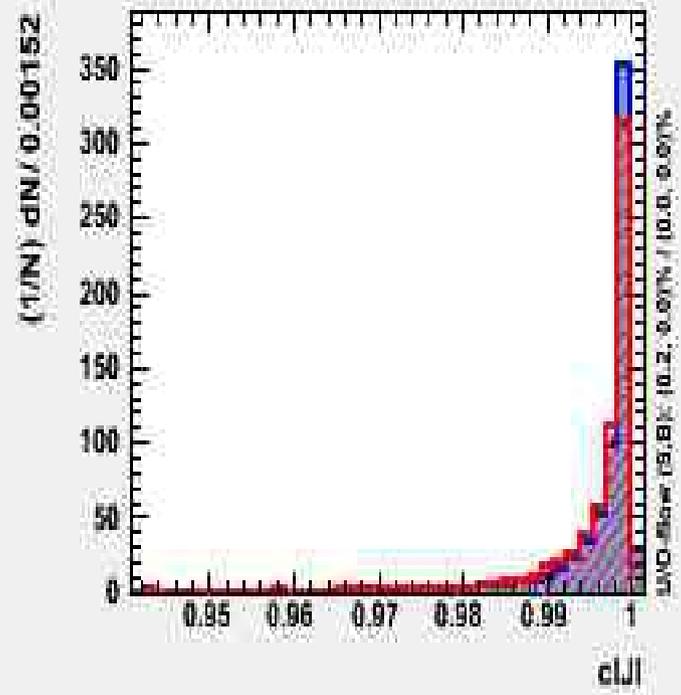
Input variable: cWll



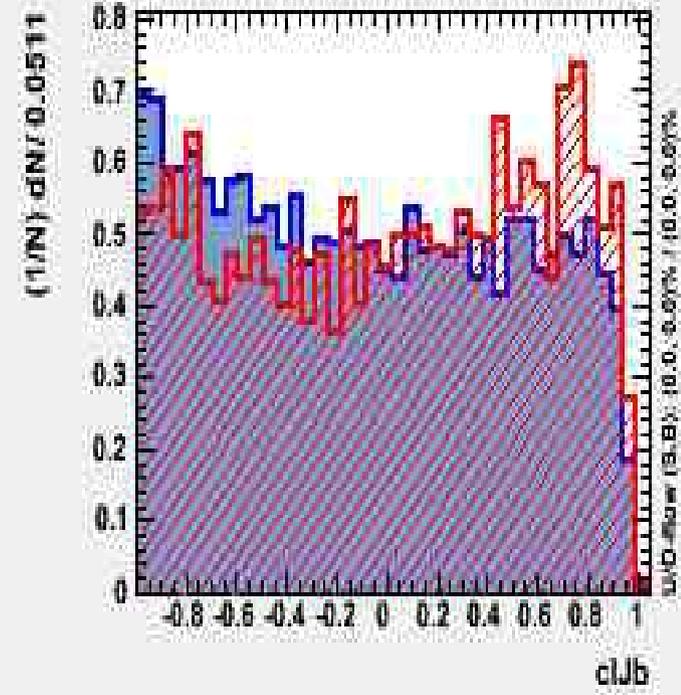
Input variable: cWhl



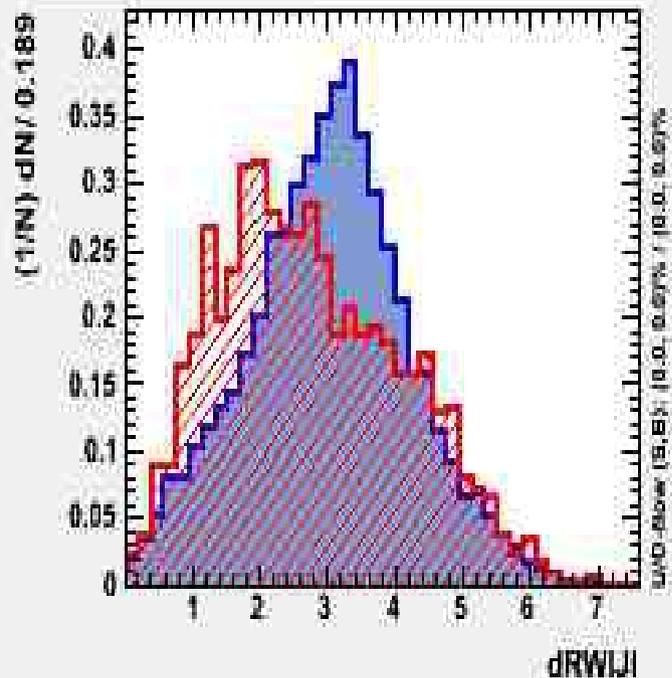
Input variable: cJl



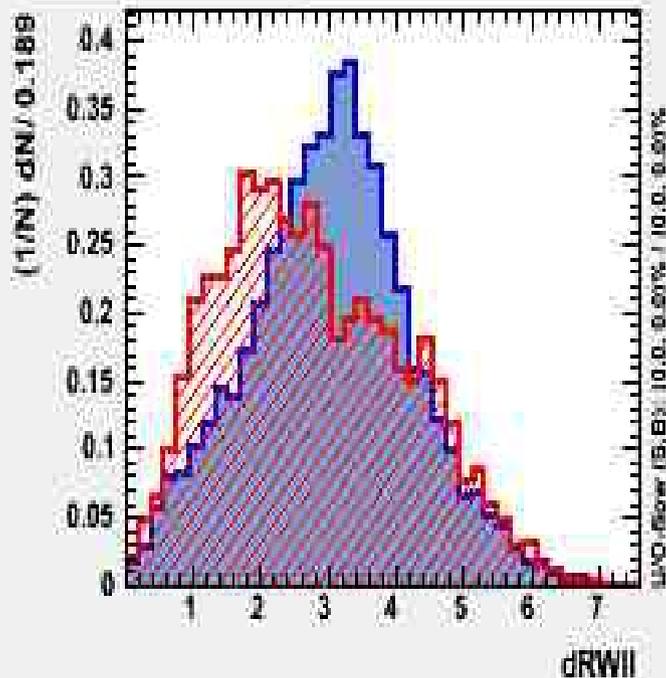
Input variable: cJlb



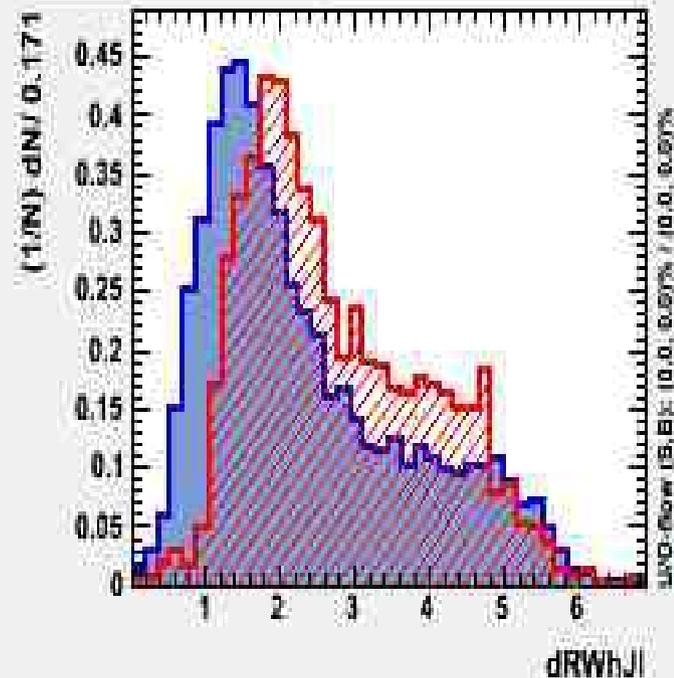
Input variable: dRWLJl



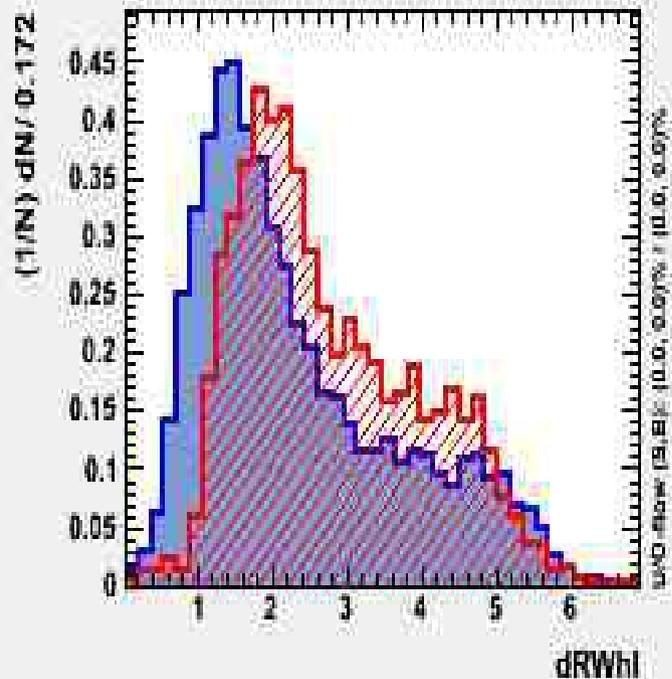
Input variable: dRWlI



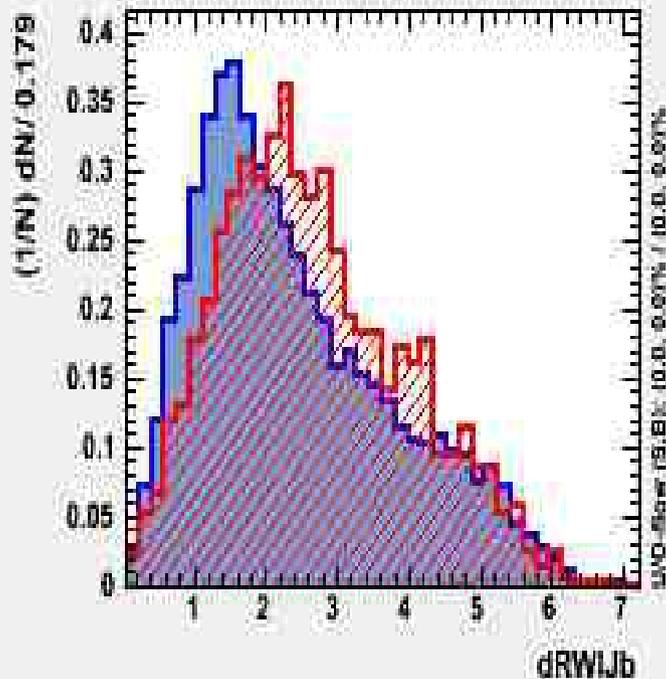
Input variable: dRWWhJl



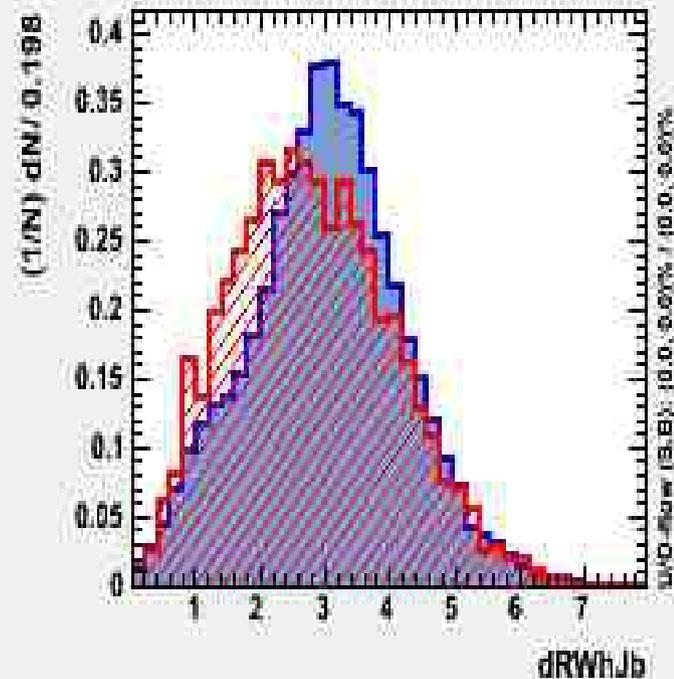
Input variable: dRWWhl



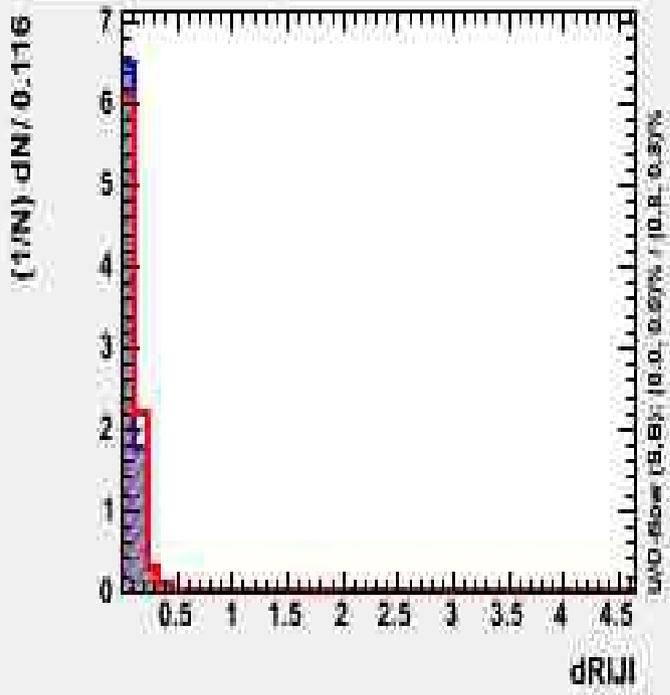
Input variable: dRWlJb



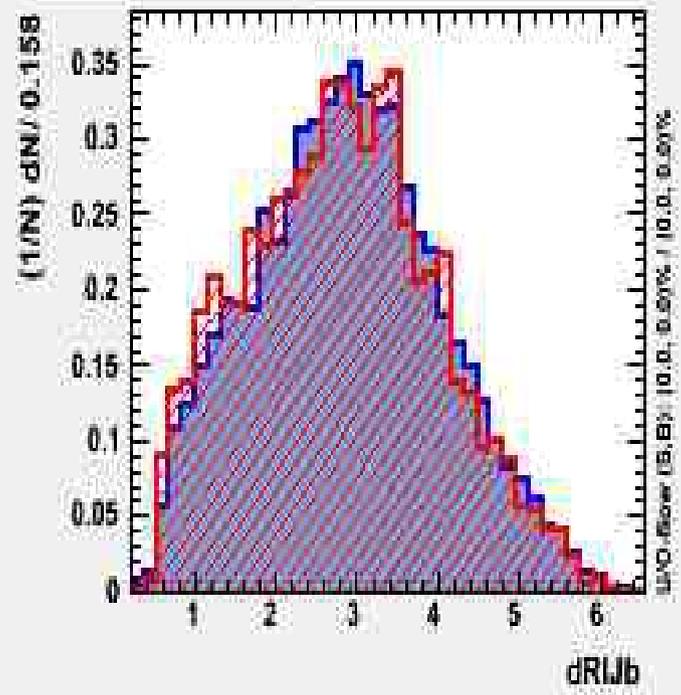
Input variable: dRWWhJb



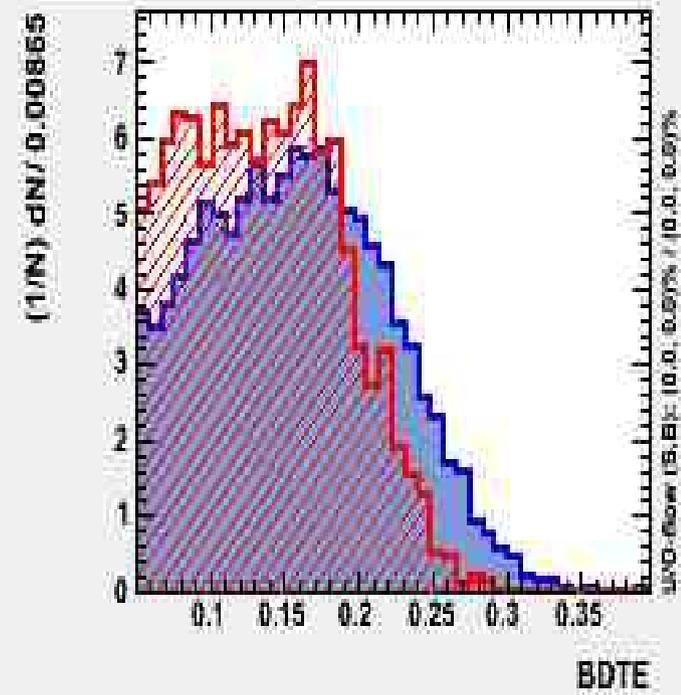
Input variable: dRII



Input variable: dRIIb

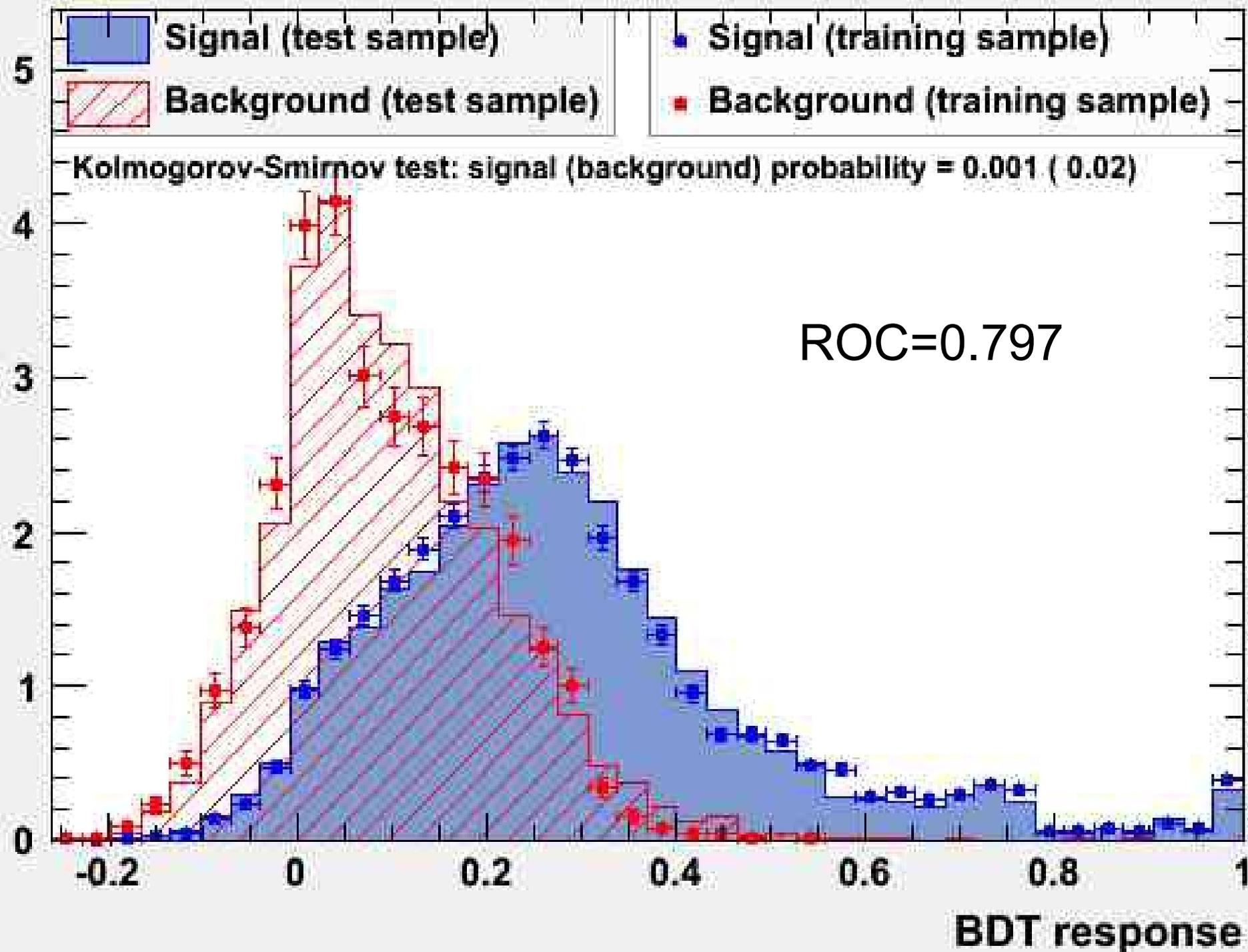


Input variable: BDTE

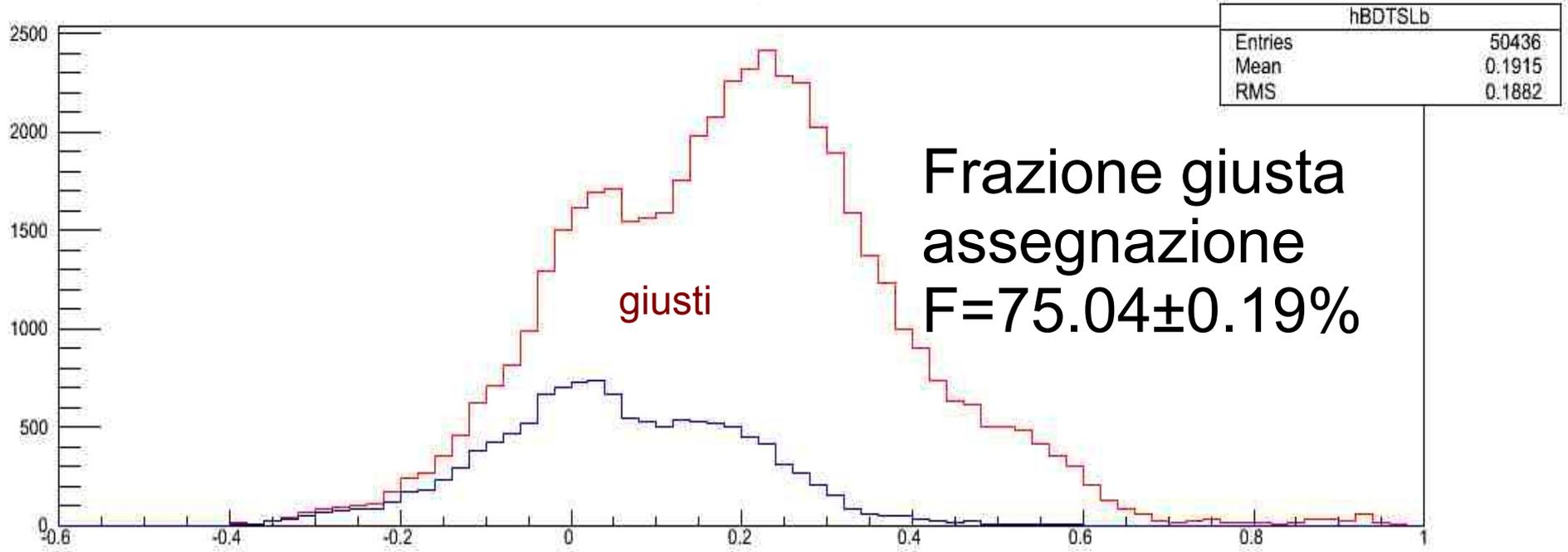


TMVA overtraining check for classifier: BDT

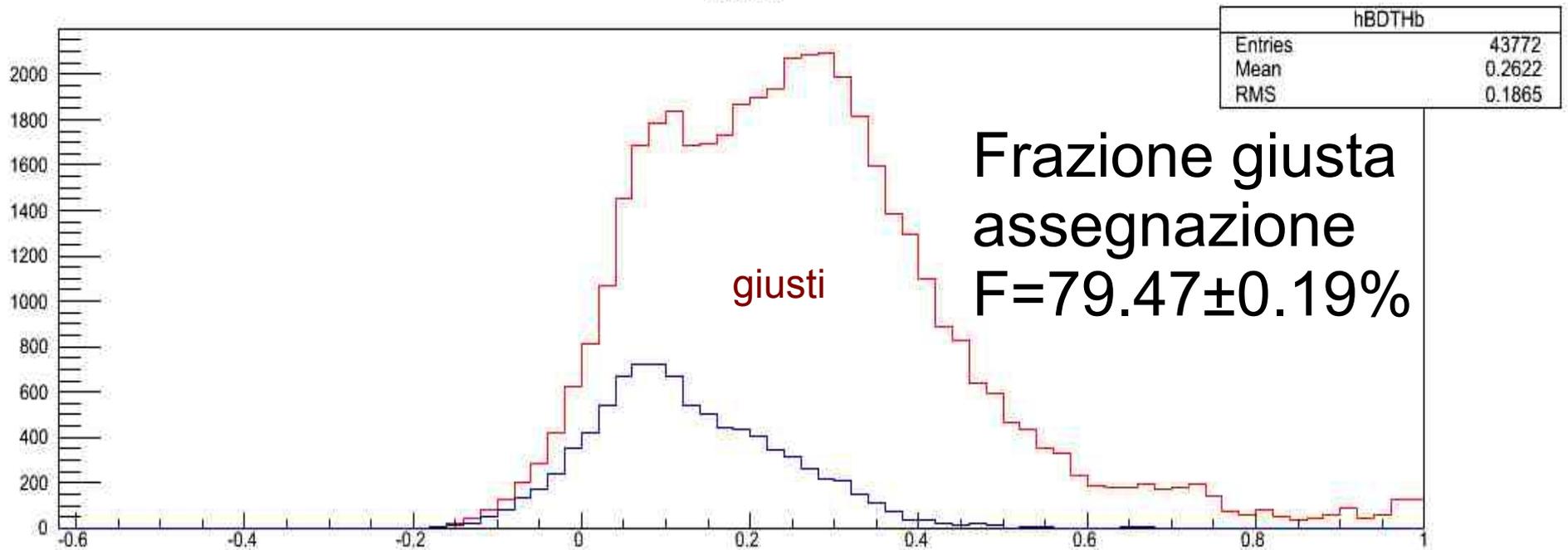
$(1/N) dN/dx$



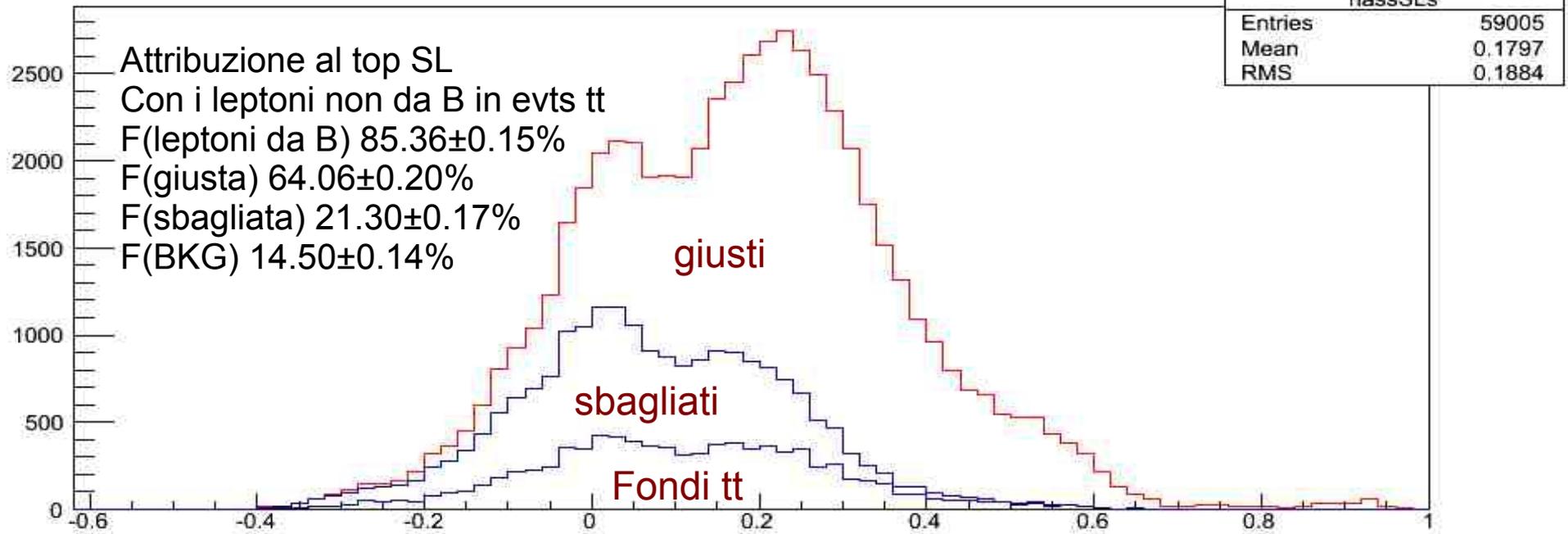
BDTSLb



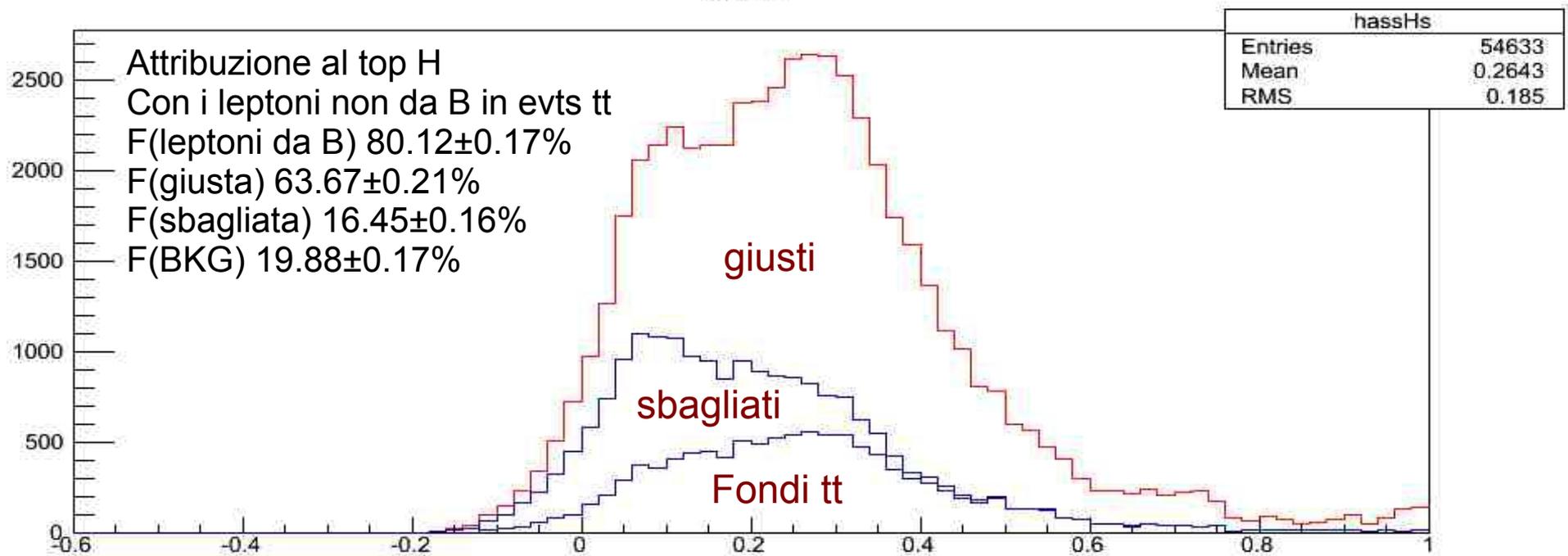
BDTHb



assSLs

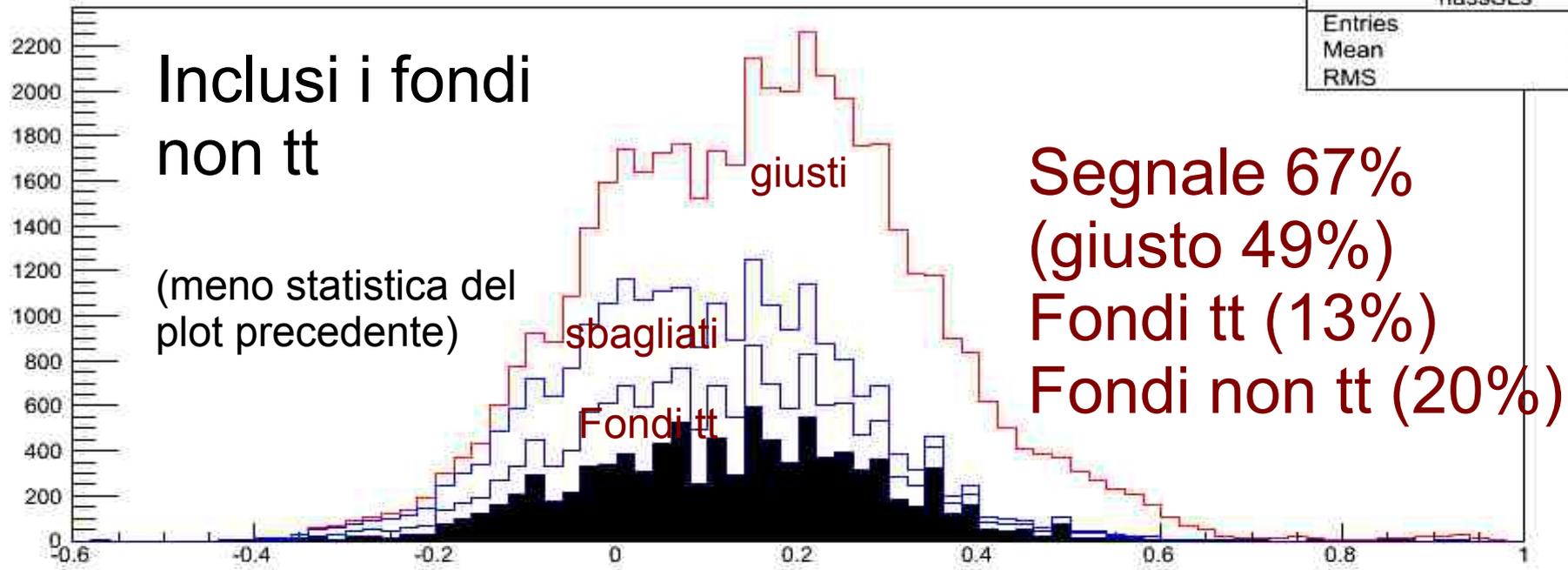


assHs



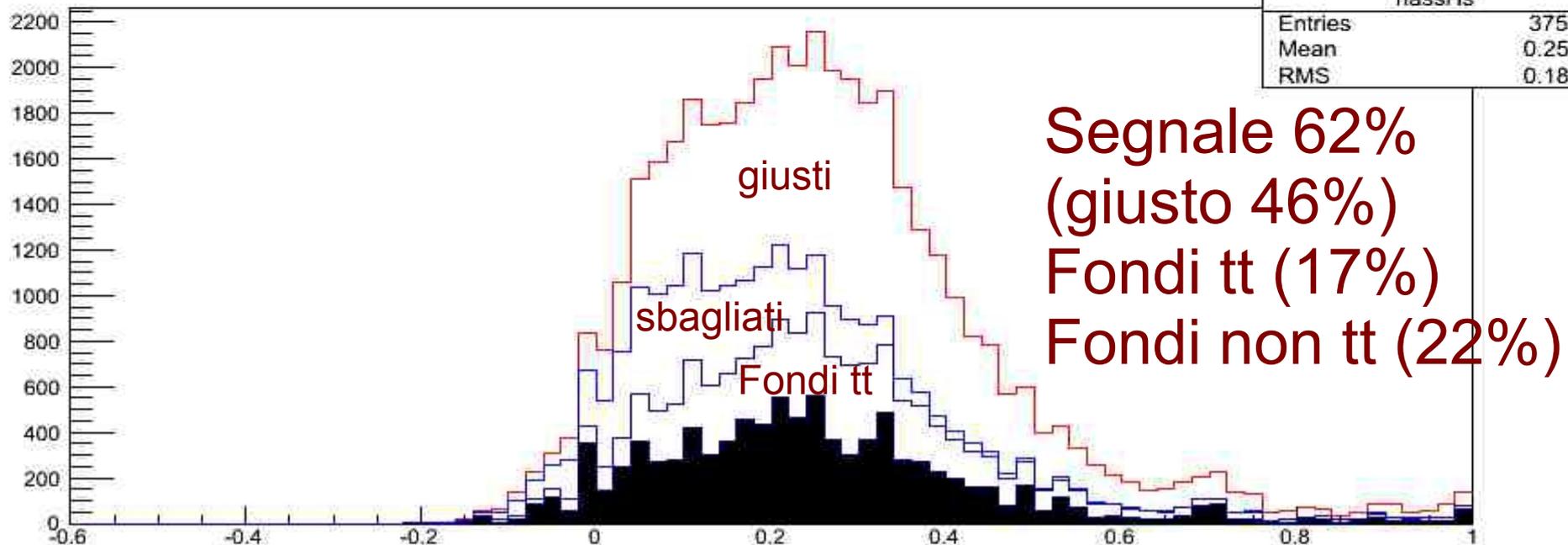
assSLs

hassSLs	
Entries	40690
Mean	0.1581
RMS	0.1809



assHs

hassHs	
Entries	37574
Mean	0.2563
RMS	0.1856



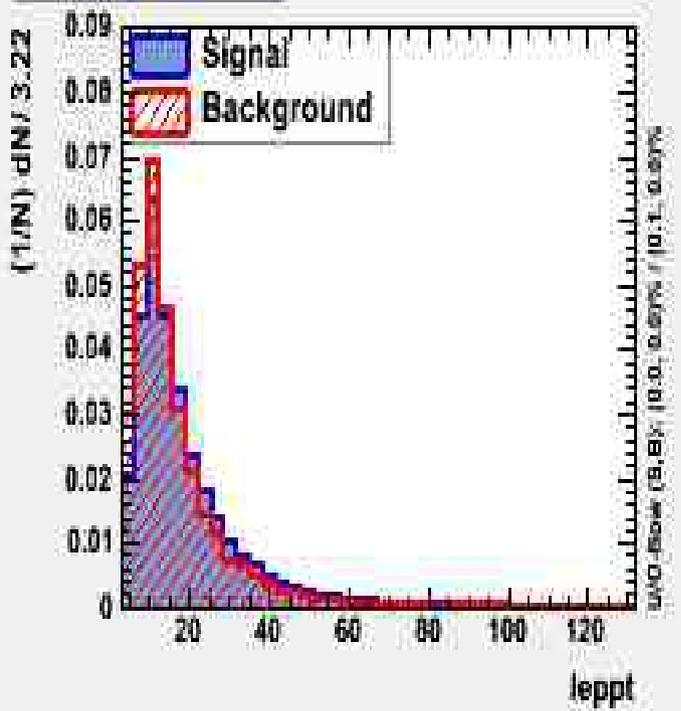
Campione normalizzato (al 3.5% del segnale MC)

	Tt	Ttf	Wj	Dy	Qcd	Altro
SlS	18909	2601	-	-	-	1117
Slb	6357	1938	-	-	-	83
Slf	4317	1600	2756	2181	2909	1537
Hs	17352	2321	-	-	-	124
Hb	4461	1681	-	-	-	691
Hf	5356	1869	2829	1804	2909	1849

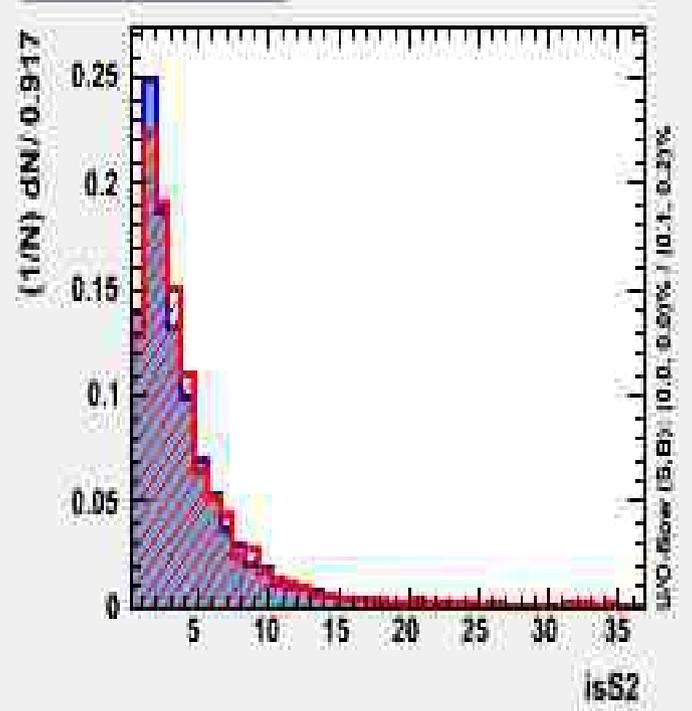
	Giusti	Sbagliati	Segnale (G+B)	Fondi-tt	Fondi
SL	49%	18%	67%	13%	20%
H	46%	16%	62%	17%	22%

Discriminazione fondo leptoni in eventi tt
Attribuzione al top SL

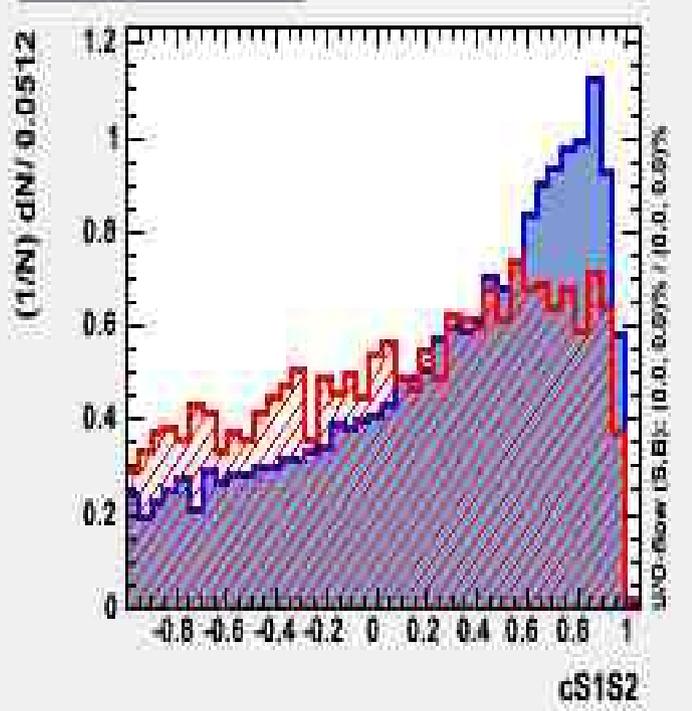
input variable: leppt



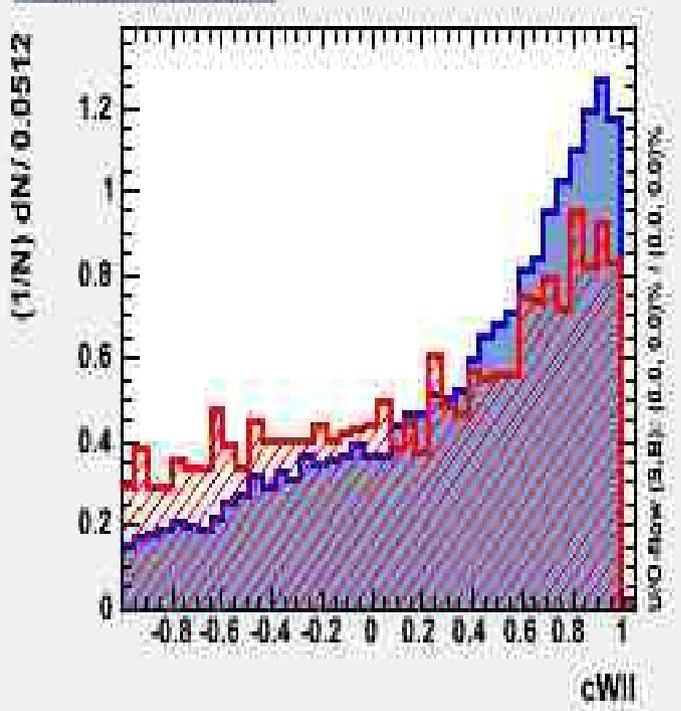
input variable: ls52



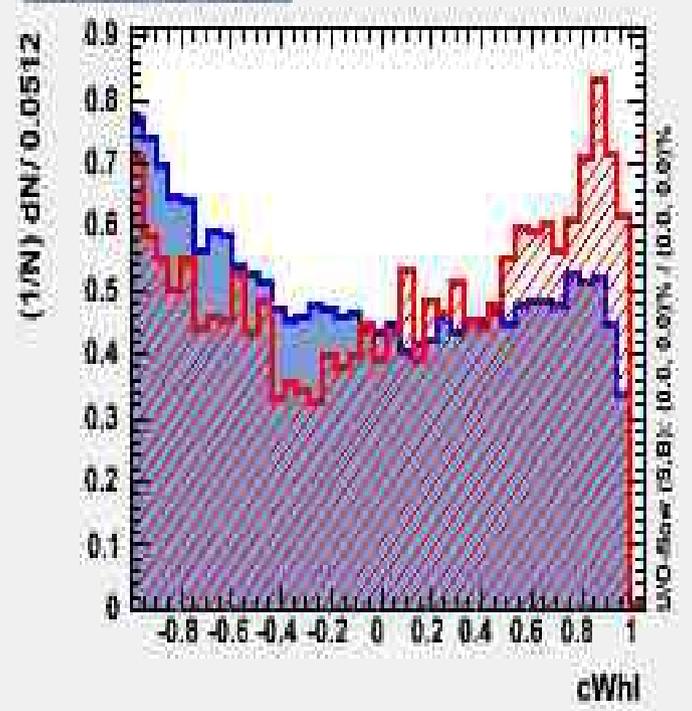
input variable: cS1S2



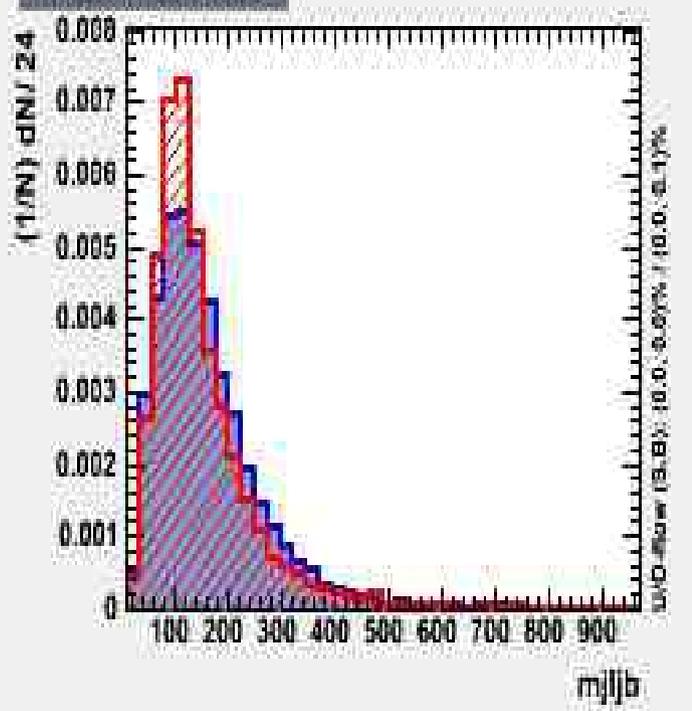
input variable: cWll



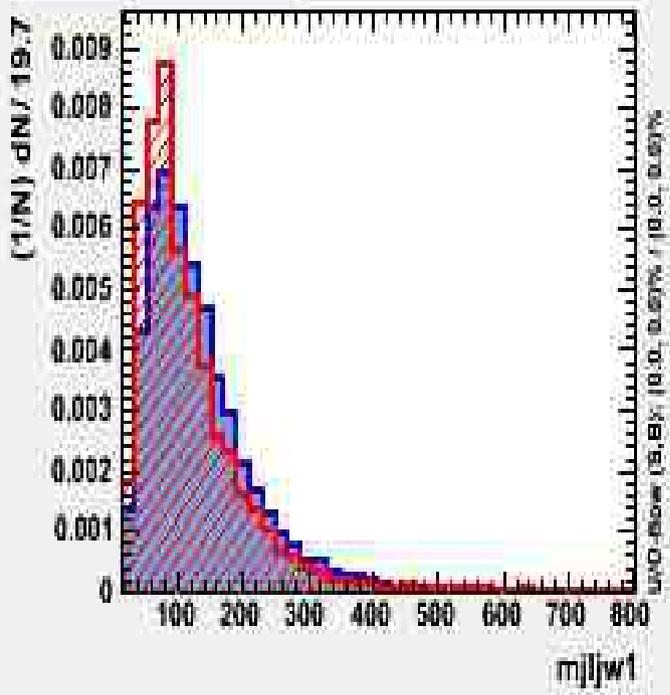
input variable: cWhl



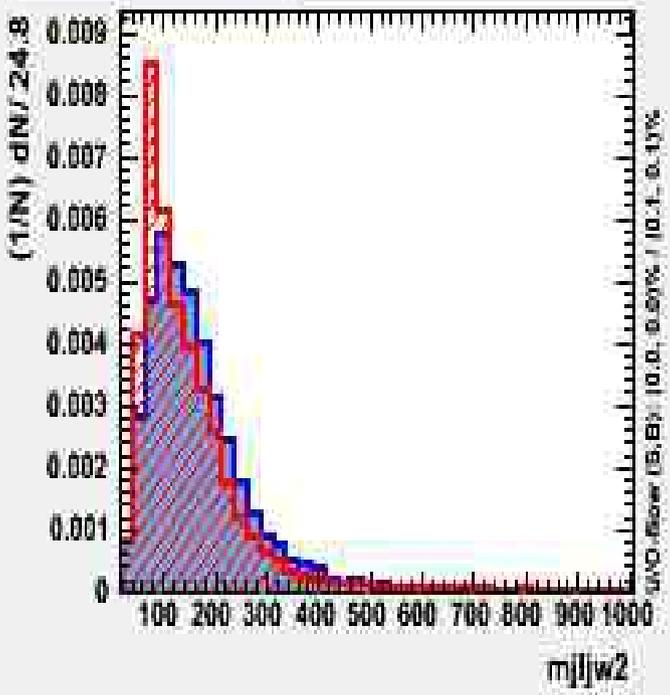
input variable: mlljb



Input variable: mjljw1

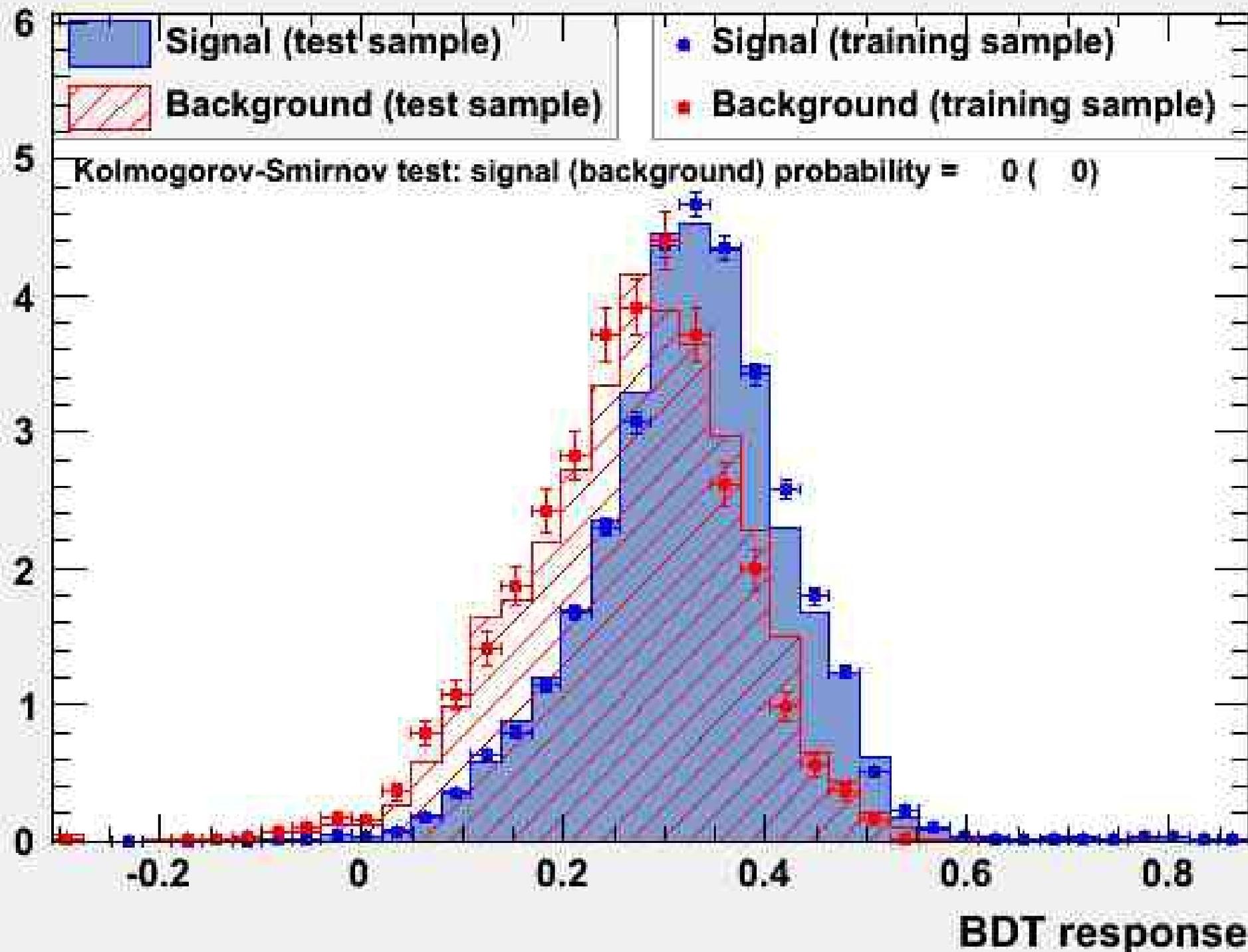


Input variable: mjljw2



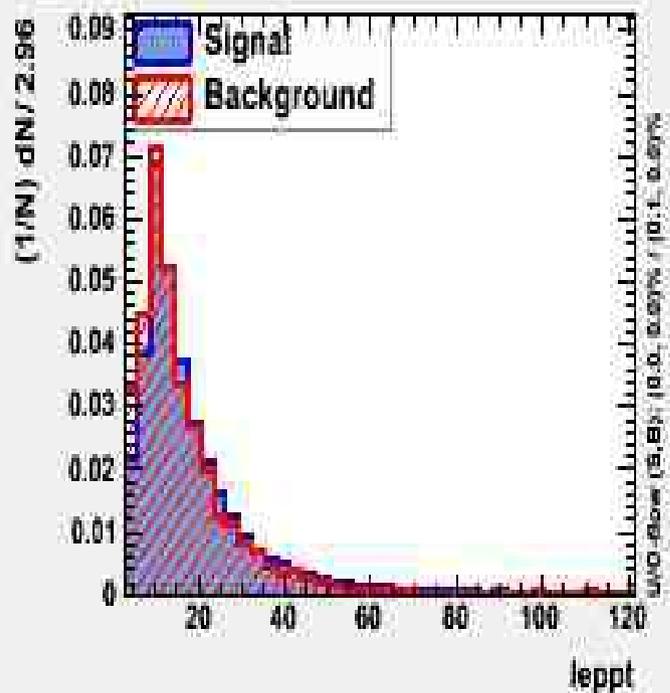
TMVA overtraining check for classifier: BDT

$x_p / (N_p) \cdot dN / dx$

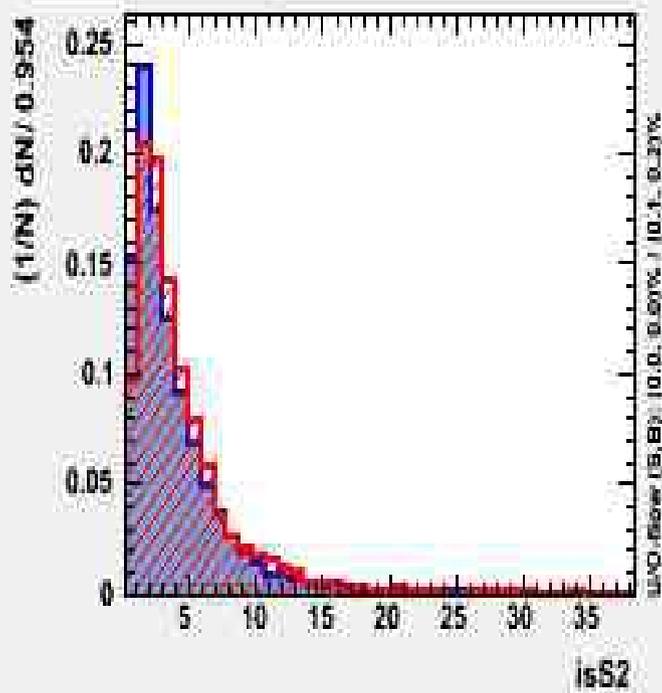


Discriminazione fondo leptoni in eventi tt
Attribuzione al top H

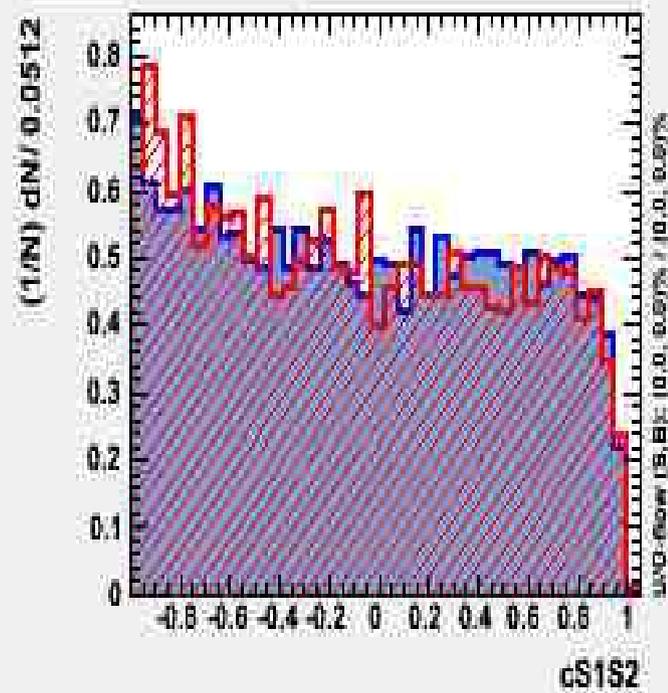
Input variable: leppt



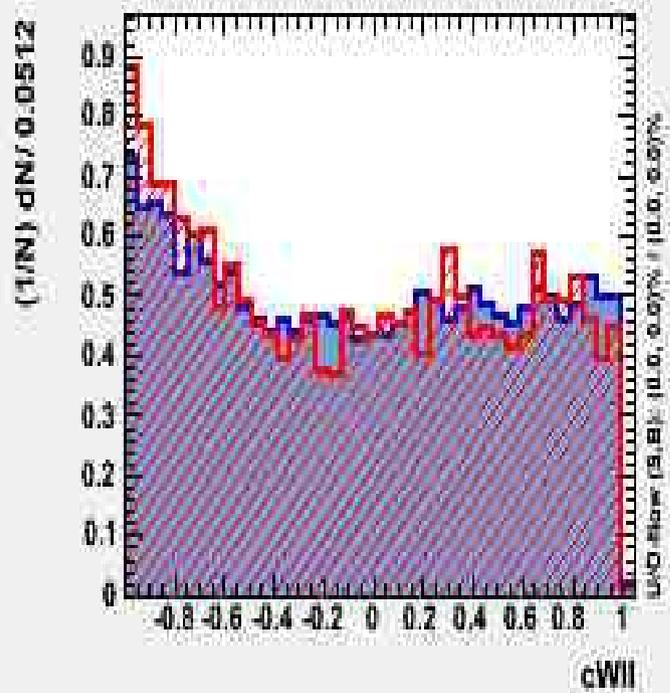
Input variable: isS2



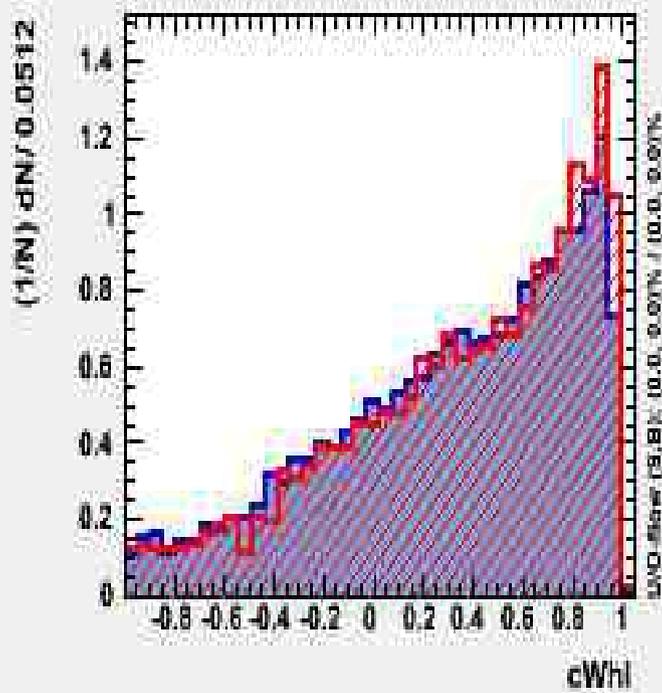
Input variable: cS1S2



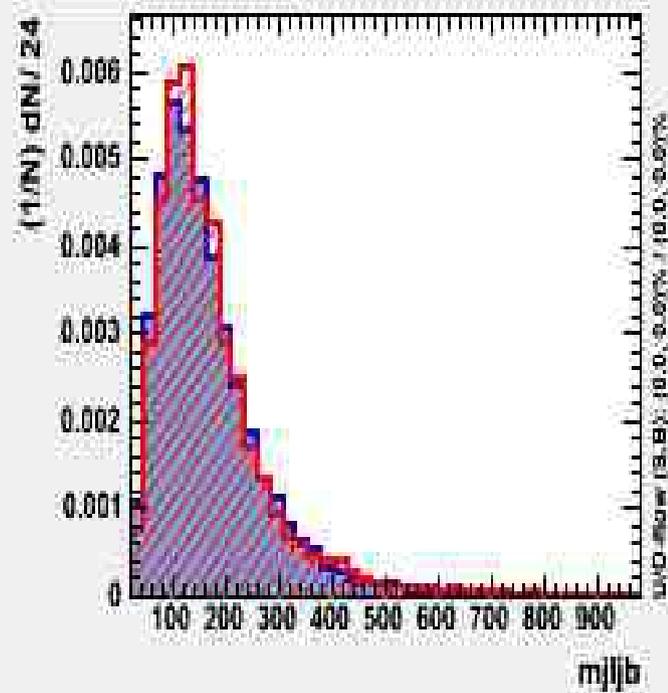
Input variable: cWll



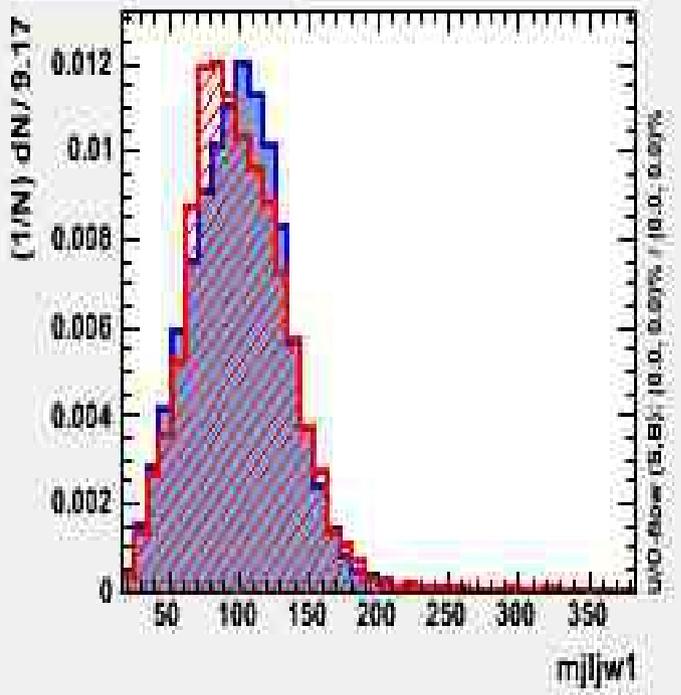
Input variable: cWhl



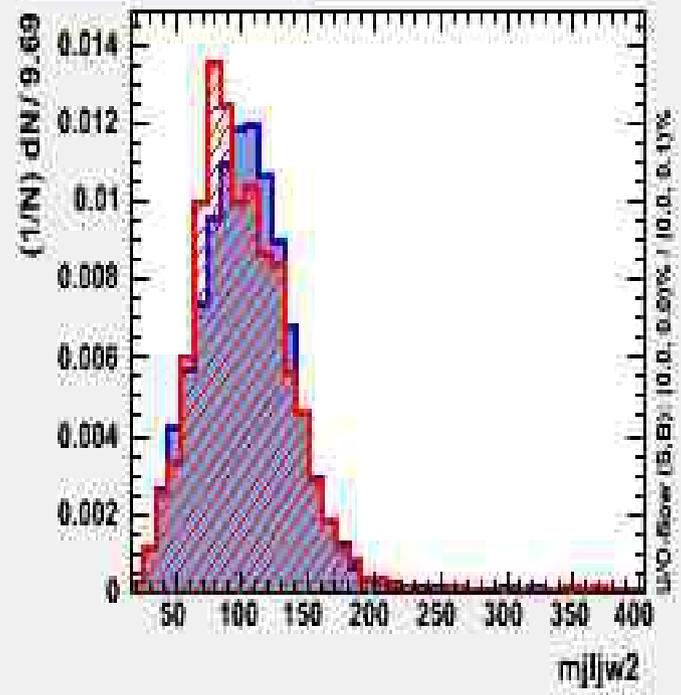
Input variable: mjlb



Input variable: mjljw1

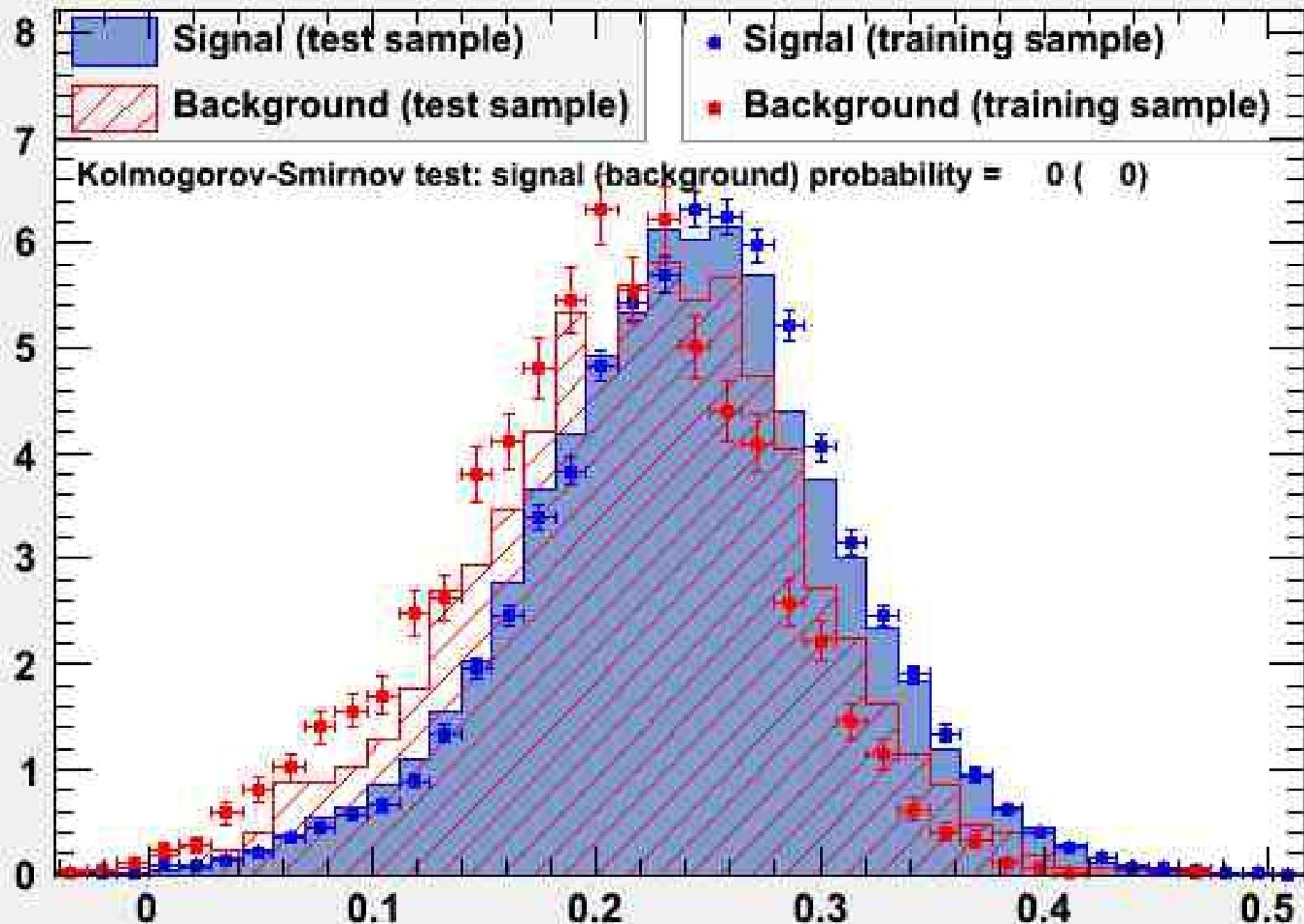


Input variable: mjljw2



TMVA overtraining check for classifier: BDT

$(1/N) dN/dx$



BDT response