

work status

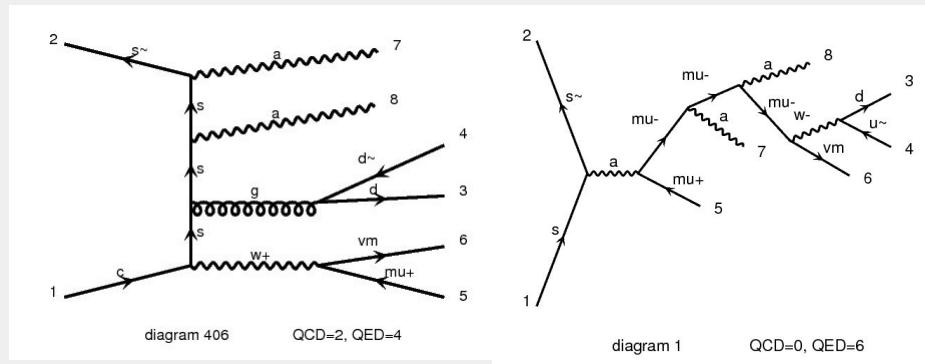
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23/11/2015

WWyy bkg samples status

- find QCD=2 include QCD=0, abandon QCD=0 request;

»QCD=2:



- QCD=2 validation is done;
- No progress**
- alpgen is dropped in MC15 production, waiting for experts' responses.

		Generators	Lumi(pb)*xsec(p b ⁻¹)	needed	currently produced	status
lvjjyy	QCD=2	MadGraph5	20k*0.03=600	100k	100k	done
	QCD=0	MadGraph5	20k*0.001=20	100k	100k	done
jjjjyy		Alpgen2	20k*12=240k	500k	500k	done
lvlvy		MadGraph5	20k*6e-5=1.2	5k	20k	done

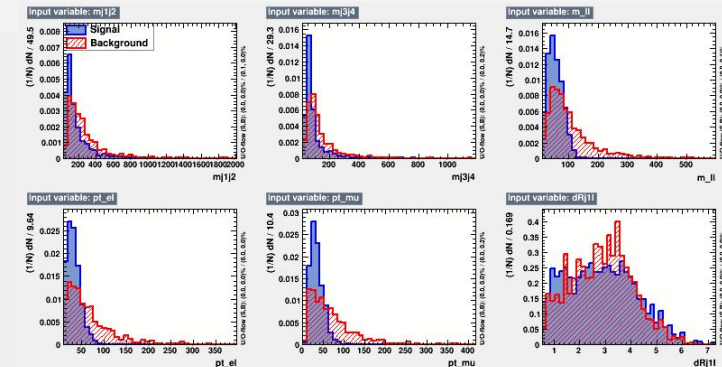
WWWW status

- sig: $pp \rightarrow H(300\text{GeV}) \rightarrow hh, hh \rightarrow w^+ w^- w^+ w^-, w^+ \rightarrow l^+ \nu_l, w^- \rightarrow jj$ @14TeV
- bkg: following weiming's steps, consider processes below, adding Zhjj. xsection need cross-check
- pre-selection: two same sign leptons, ≥ 4 jets(unBtagged)

processes	xsec(fb)	#events after pre-selection
H300	$\sigma(pp \rightarrow h2, h2 \rightarrow hh) \times kfactor \times Br(h \rightarrow W^+ W^-)^2 \times 2Br(W^+ \rightarrow l\nu, W^- \rightarrow jj)^2$ 196.8	2847
ttW	$\sigma(pp \rightarrow t\bar{t} W^\pm) \times Br(t\bar{t} W^\pm \rightarrow W^+ b W^- \bar{b} W^\pm) \times Br(W^+ \rightarrow l\nu)^2 \times Br(W^- \rightarrow jj)$ 28.4	1081
ttZ	$\sigma(pp \rightarrow t\bar{t} Z) \times Br(t\bar{t} Z \rightarrow W^+ b W^- \bar{b} Z) \times 2Br(W^+ \rightarrow l\nu, W^- \rightarrow jj) \times Br(Z \rightarrow l^+ l^-)$ 21.7	1082
tth	$\sigma(pp \rightarrow t\bar{t} h) \times Br(t\bar{t} h \rightarrow W^+ b W^- \bar{b} h) \times Br(h \rightarrow WW) \times 2Br(W^+ \rightarrow l^+ \nu, W^- \rightarrow jj)^2$ 98.9	802
Whjj	$\sigma(pp \rightarrow Whjj) \times Br(h \rightarrow WW) \times Br(W \rightarrow l\nu)^2 \times Br(W \rightarrow jj)$ 3.90	135
Zhjj	$\sigma(pp \rightarrow Zhjj) \times Br(h \rightarrow W^+ W^-) \times Br(Z \rightarrow l^+ l^-) \times 2Br(W^+ \rightarrow l^+ \nu) \times Br(W^- \rightarrow jj)$ 0.89	98
WW4j	$\sigma(pp \rightarrow W^\pm W^\pm 4j) \times Br(W^+ \rightarrow l^+ \nu)^2$ 19.6	-

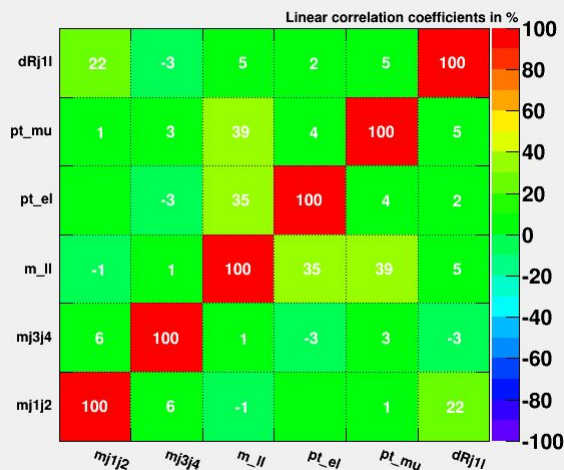
BDT analysis

- Sum all bkg components for training
- tried 6 variables:
 - dRj1l,pt_el,mj1j2,
 - mj3j4,mll,pt_mu
- correlation seems OK

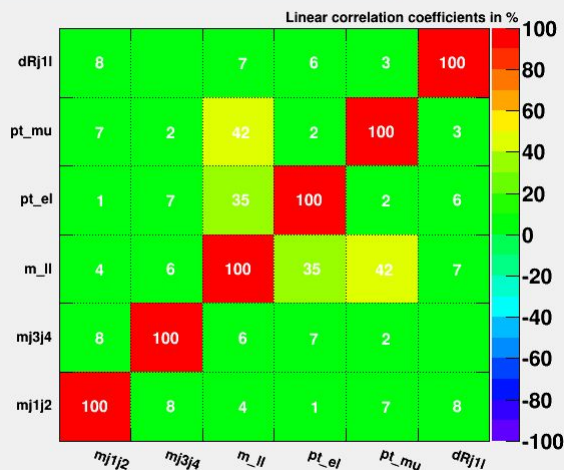


Rank	Variable	Variable Importance
1	n_dRj1l	1.869e-01
2	n_pt_el	1.738e-01
3	n_mj1j2	1.716e-01
4	n_pt_mu	1.604e-01
5	n_mj3j4	1.542e-01
6	n_m_ll	1.530e-01

Correlation Matrix (signal)

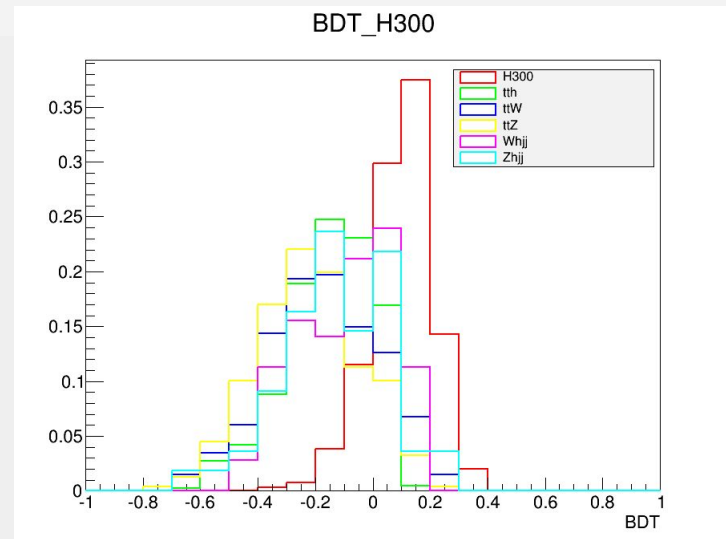


Correlation Matrix (background)

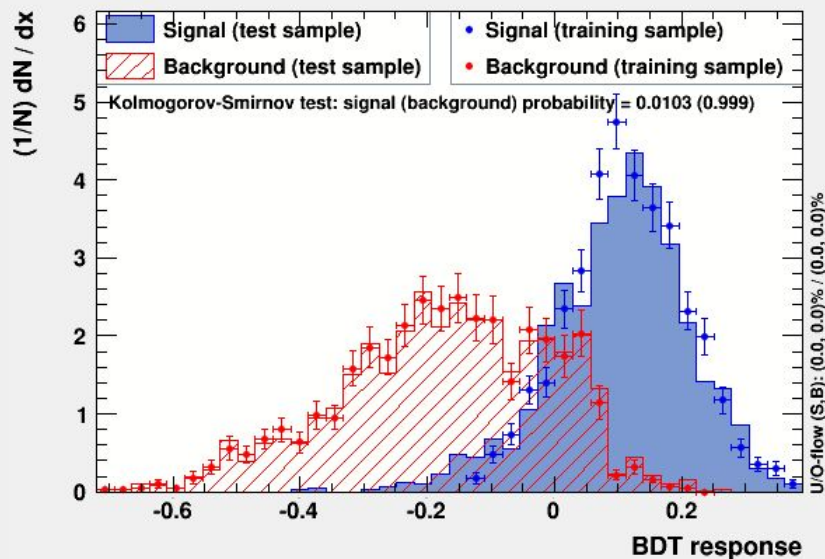


BDT continued

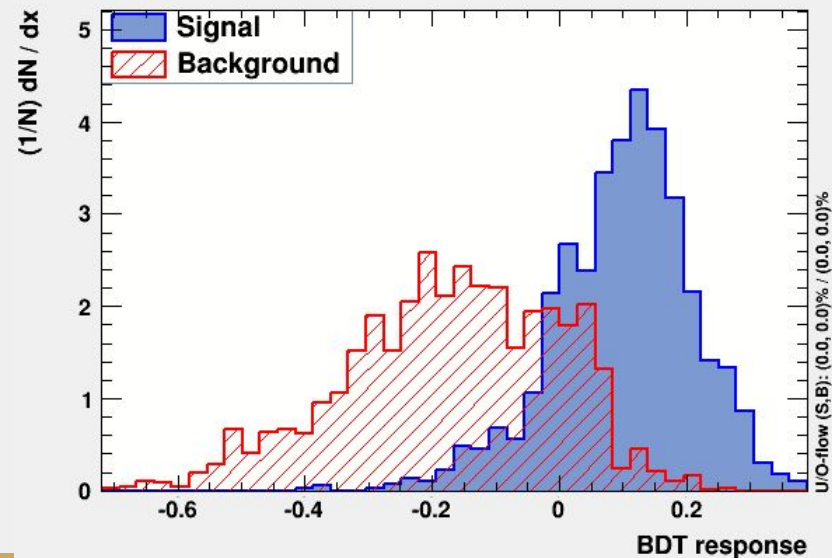
- Results seem not very good.
- The statistics maybe too low



TMVA overtraining check for classifier: BDT



TMVA response for classifier: BDT



summary & to do

- ⊙ Bkg are complete? How about $p p \rightarrow l \nu j j l \nu j j$?
 - ⊙ produce more samples, train H300 vs tth, H300 vs ttW ...separately
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- ⊙ took one shift last week, already booked two this week