

Weekly Report

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2LSS mva study

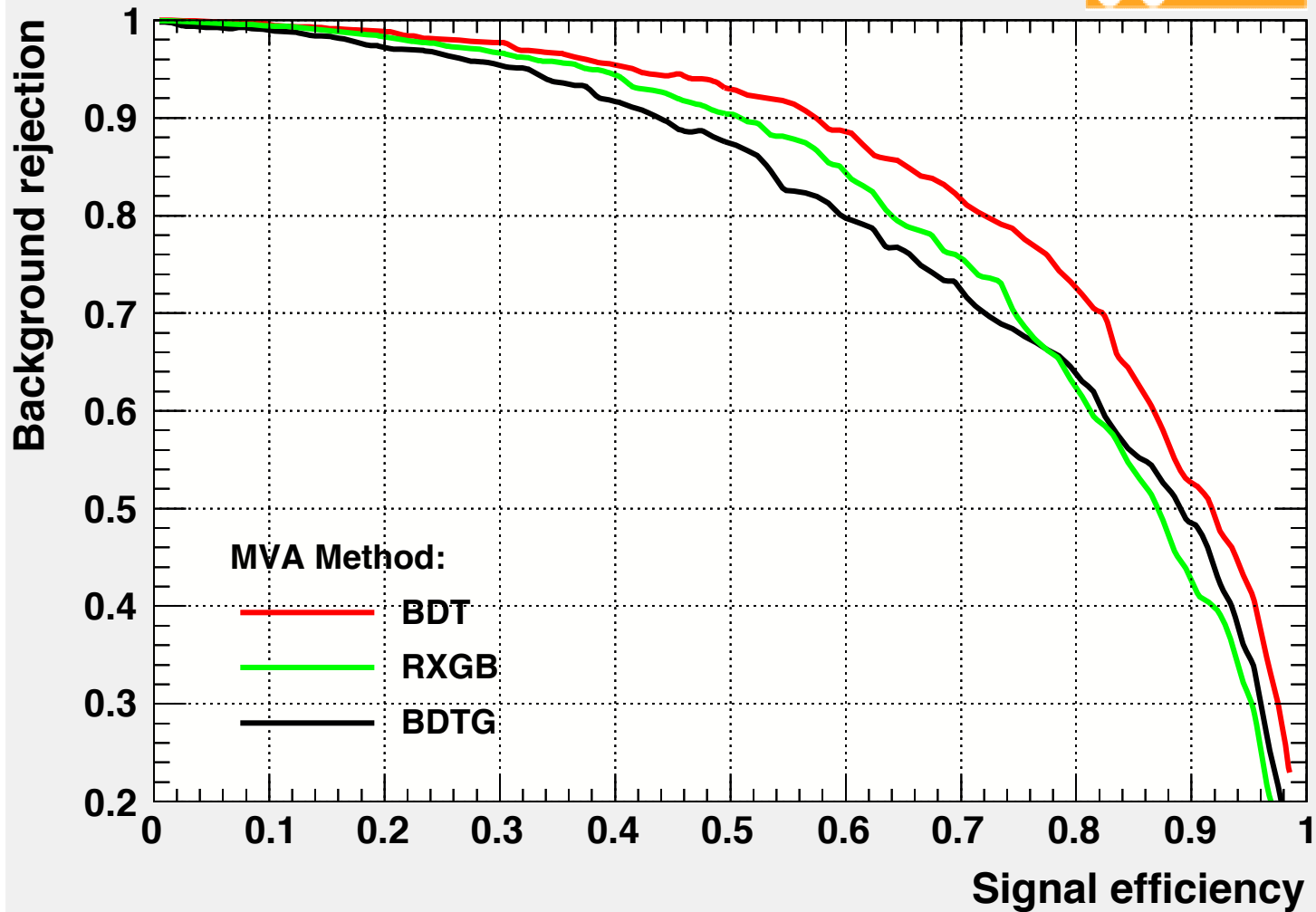
Signal : non-resonate diHiggs	9360 events
Bkg: prompt, Vgam, QmisID and fake	319019 events

Classifier method: BDT, BDTG, xgboost(RXGB)

Xgboost implementation in ROOT-R: <http://oproject.org/pages/ROOTR.html>

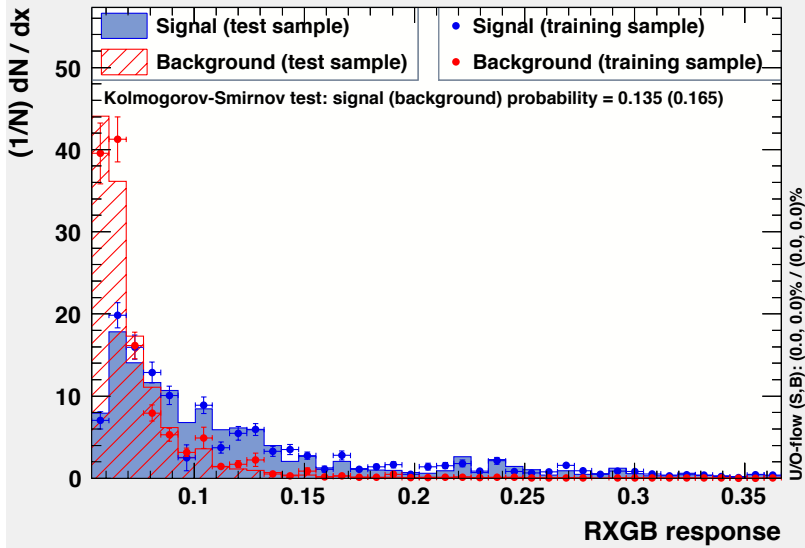
- Class: MethodRXGB
- Option: just only three
 - Nrounds: The max number of iterations
 - Eta: Step size shrinkage used in update to prevents overfitting
 - MaxDepth: Maximum depth of the tree

Background rejection versus Signal efficiency



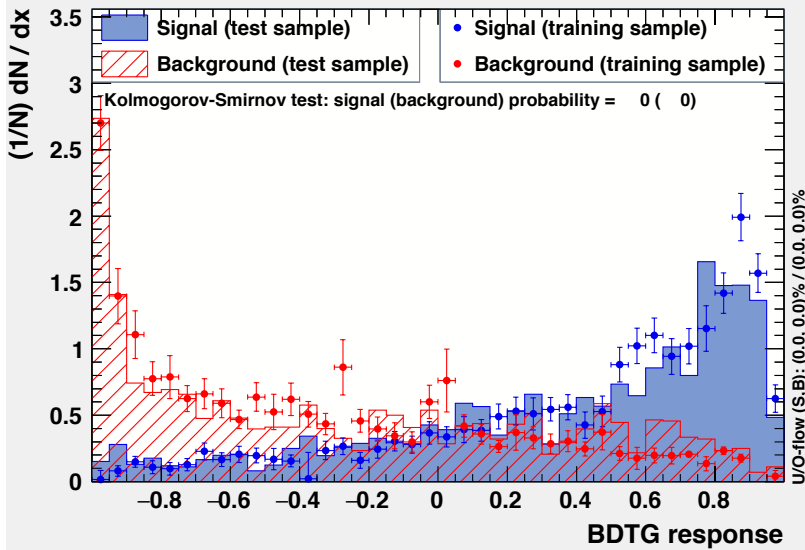
Cut at Effsig: BDT(0.8298),BDTG(0.912),RXGB(0.7999)

TMVA overtraining check for classifier: RXGB

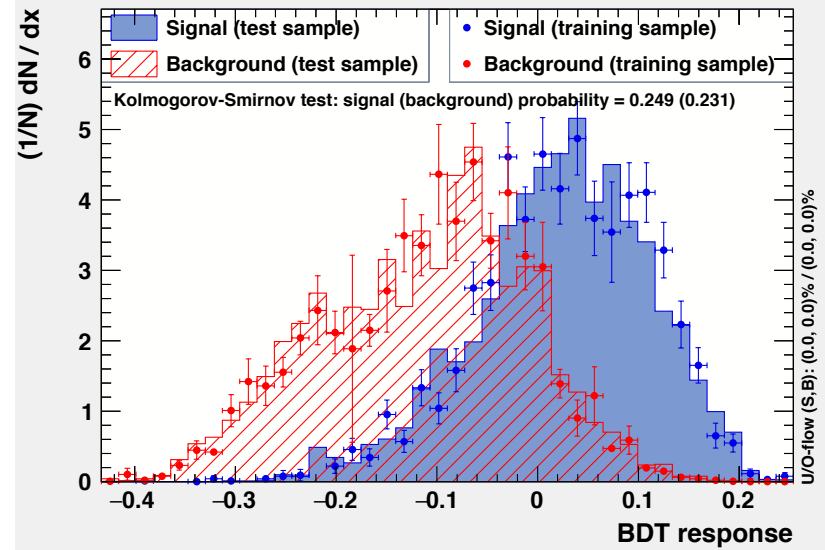


- Nrounds:10
- Eta:0.3
- Maximum depth:3

TMVA overtraining check for classifier: BDTG



TMVA overtraining check for classifier: BDT



H->S+h study

- Fit with a global chi2

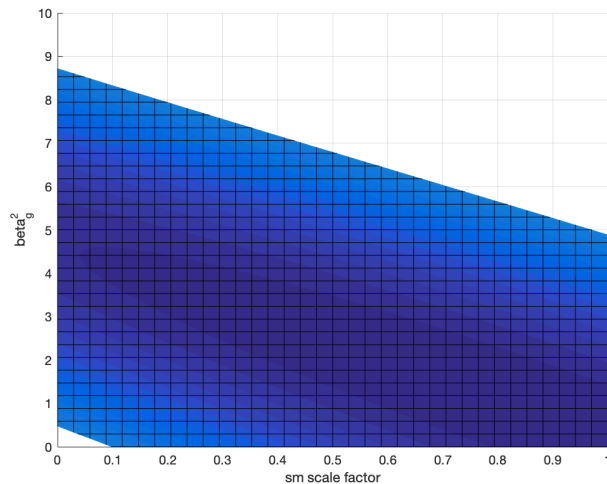
Dataset:

- ATLAS RUN2 higgs->yy
- CMS RUN2 higgs->ZZ->4l

Process: H(270GeV)->S(140GeV)+h

Interesting parameter: pt, rapidity

Results:



- Minimum value at :
- sm factor = 0.7971, beta_g(for BSM) = 1.1324
- Uncertainties are calculated by varying the observed error on data

- sm factor = 0.7971 ± 0.102
- Beta_g = 1.1324 ± 0.4206

mH	mS	sm factor	Beta_g	chi2
270	140	0.7971	1.1324	28.652
270	150	1	0.1703	31.5204
270	160	1	0.0996	31.7503
270	170	1	0.0703	31.8166
260	140	1	0.1661	31.5108
260	150	1	0.1003	31.7368
260	160	1	0.0775	31.7909
260	170	1	0.0614	31.8252
250	140	1	0.0614	31.8252
250	150	1	0.0752	31.7899
250	160	1	0.0651	31.8089
250	170	1	0.0544	31.8292

- Conclusion

- It seems promising for SH model at 270GeV,140GeV
- the contributions for BSM for other mass point are vary small.
- Likely to generate events around $m_H=270\text{GeV}$
- Look into RUN1 data.