ZHHAnalysis.

MVA stuff

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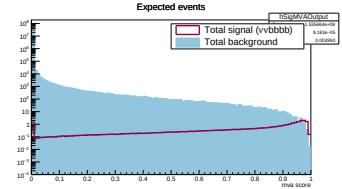
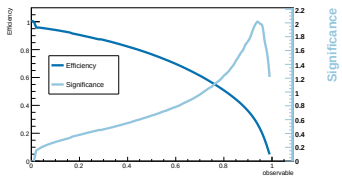
HELMHOLTZ

vvbbbb signal (no splitting)

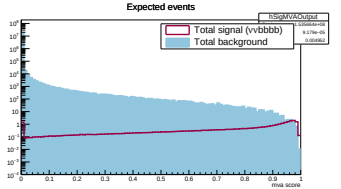
Best trial (589):
max_depth: 7
n_estimators: 265
learning_rate: 0.070

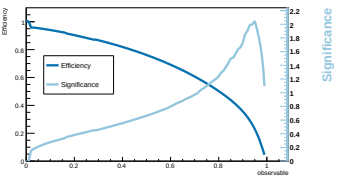




$S = 9.85, B = 14$
$S/\sqrt{S+B} = 2.02$

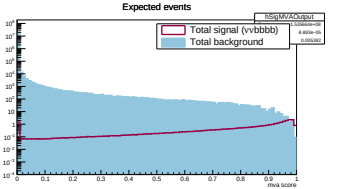
Second best trial (525):
max_depth: 7
n_estimators: 316
learning_rate: 0.056

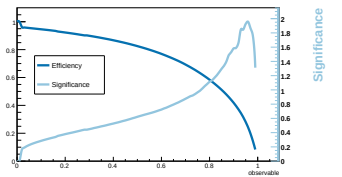




$S = 8.51, B = 8.9$
$S/\sqrt{S+B} = 2.04$

Third best trial (131):
max_depth: 7
n_estimators: 259
learning_rate: 0.155



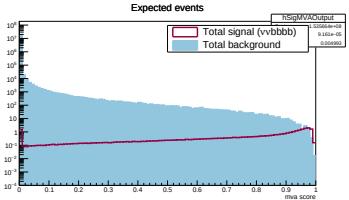


$S = 8.99, B = 12.15$
$S/\sqrt{S+B} = 1.96$

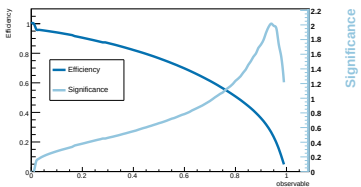
vvbbbb signal (no splitting) - adding backgrounds

Classes:

- signal: vvHHbbbb
- bkgs: bbbb, lvbbqq, vvqqH, vvbbbb

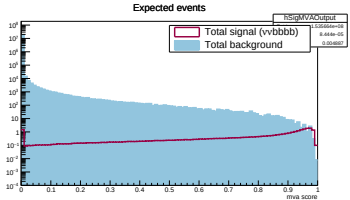


$S = 9.85$
$B = 14$

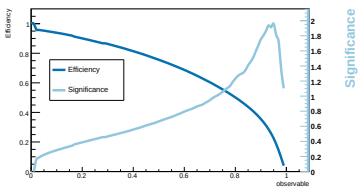


$$\frac{S}{\sqrt{S+B}} = 2.02$$

- $+$: bbqqqq, vvbb



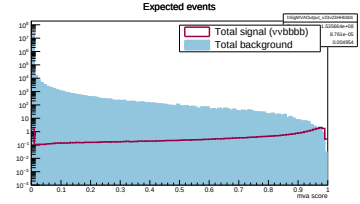
$S = 8.34$
$B = 9.77$



$$\frac{S}{\sqrt{S+B}} = 1.96$$

Separating MVAs

ZHH:

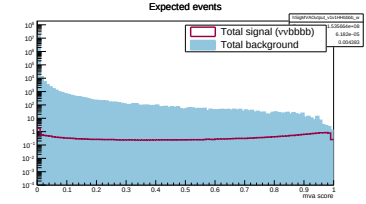


$S = 8.44$
$B = 10.83$

$$\frac{S}{\sqrt{S+B}} = 1.92$$

- signal: v23v23HHbbbb
- bkgs: bbbb, lvbbqq, vvqqH, vvbbbb

WBF:



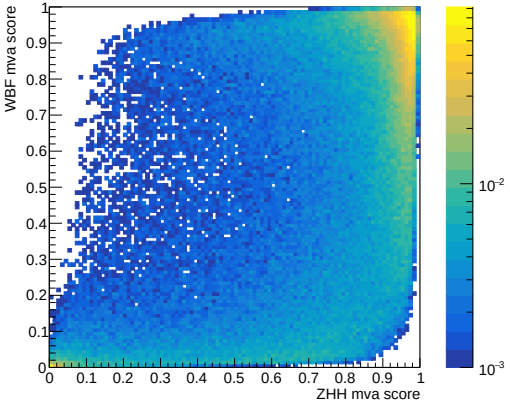
$S = 3.54$
$B = 16.8$

$$\frac{S}{\sqrt{S+B}} = 0.785$$

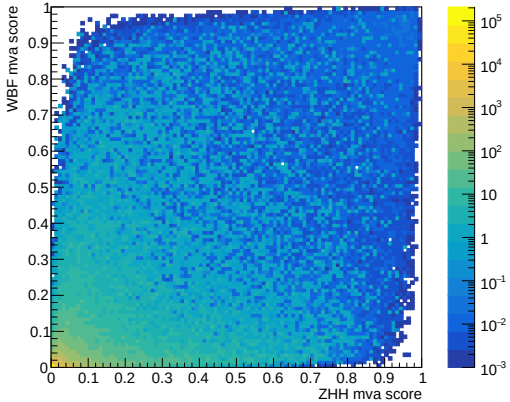
- signal: v1v1HHbbbb_w
- bkgs: bbbb, lvbbqq, vvqqH, vvbbbb

Befriending MVAs

Total signal:



Total background:



DESY.