

Weekly report

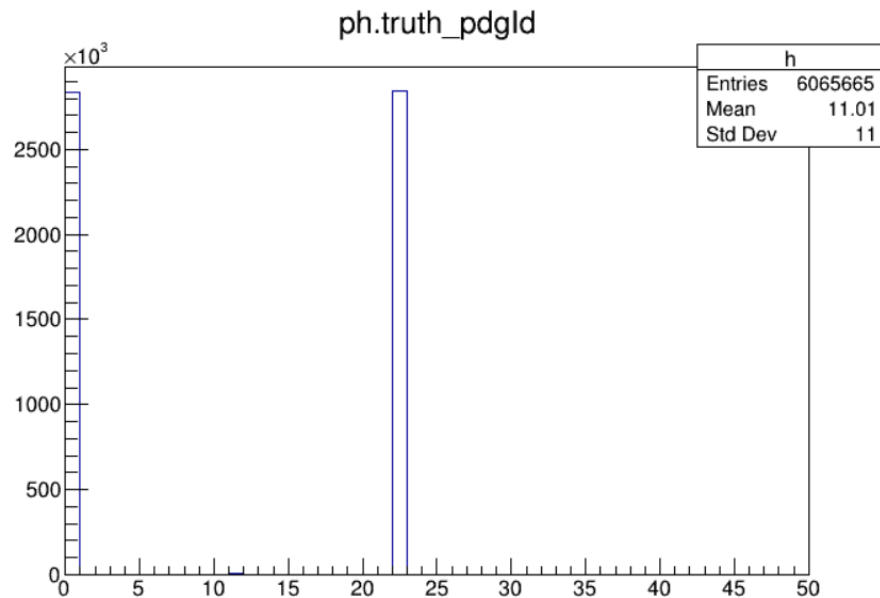
FANGYI GUO



Working status

QT: topo-cluster variable study.

- Previous: very few signal-bkg separation power after cut.
- Update: use truth match to have real background sample, i.e. fake photon from jets.

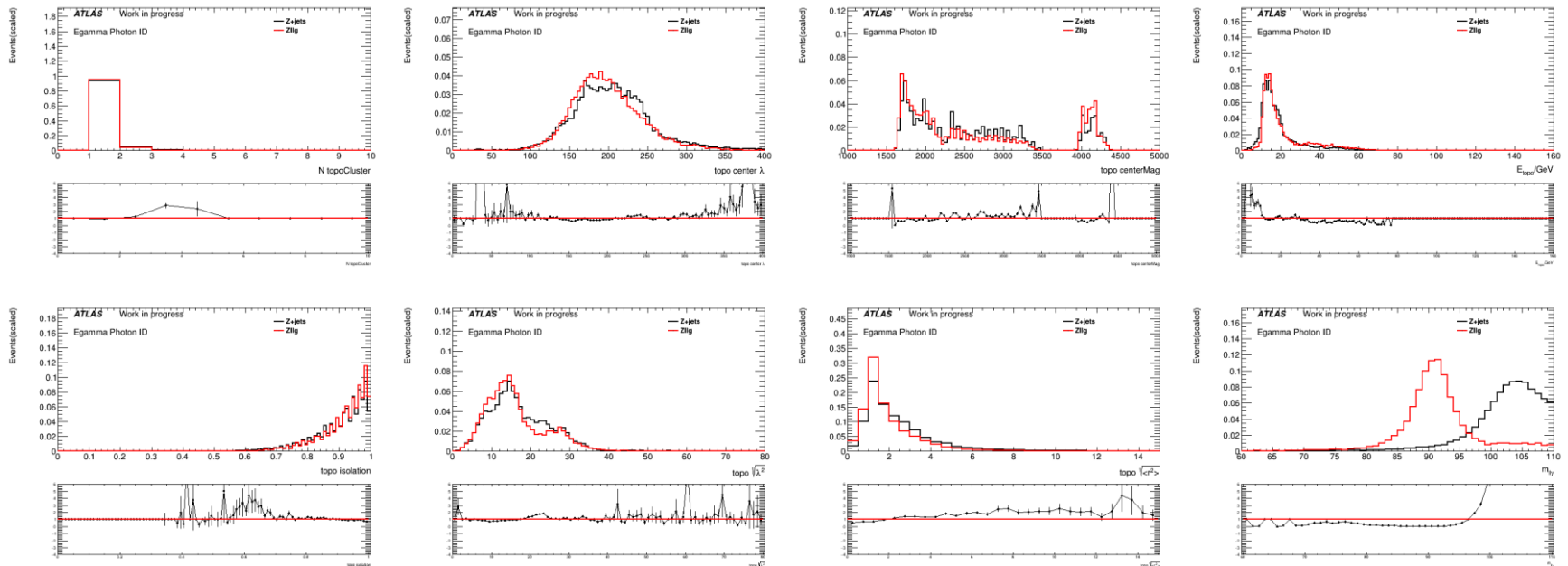


pdgID for Z+jets sample. Half of them comes from truth photon.

Working status

Zllg vs. Z+jets (real photon and fake photon)

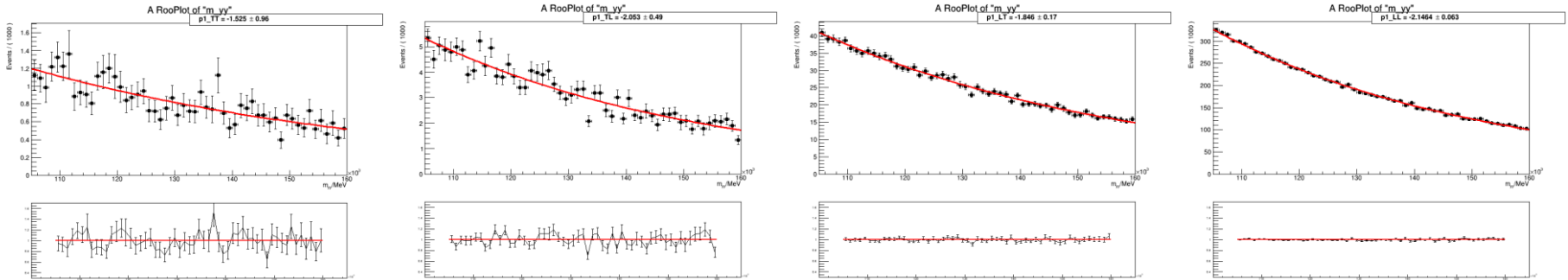
- ee+gamma, $7\text{GeV} < pT_\gamma < 15\text{GeV}$



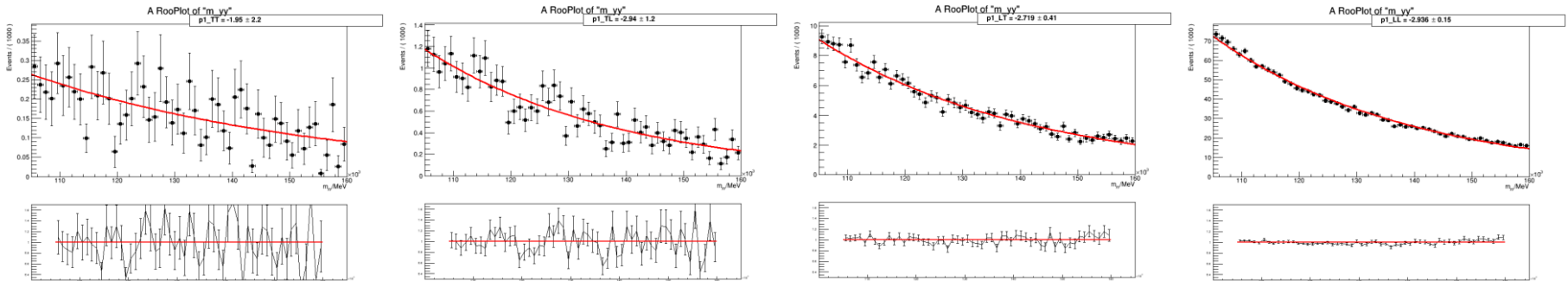
Shows some difference between signal and background, but hard to say.
May need more statistics and MVA.

Working status

VBF Higgs CP: background modelling for $\gamma\gamma$ and $\gamma j + jj$ separately.



$\gamma\gamma$ component



$\gamma j + jj$ component

Working status

VBF Higgs CP: before full set of background modelling, it's better to estimate the new BDT.

- 4 categories share same bkg model can be an assumption at first step, and based on this we can do some estimations about BDT performance.
- In final analysis the difference could be introduced as a systematic term?

Totally 4 categories after this: TT, TL, LT, LL.

	TT	TL	LT	LL	inclusive
Nvbf	22.4585	23.9795	49.9235	39.9708	136.332
Nggh	1.42379	2.87531	22.5601	72.292	99.151
yybkg	44.2001	174.357	1390.76	10257.7	11867.017
yj+jj bkg	8.89298	31.9676	259.033	1978.48	2278.374
tot bkg	53.093	206.325	1649.793	12236.180	14145.391
SB data	72	234	1533	9477	11316.000
bkg in [105,160] (extrapolated)	90	292.5	1916.25	11846.25	14145
bkg in [120, 130] (extrapolated)	18.000	58.500	383.250	2369.250	2829.000
VBF/(VBF+ggH)	94.04%	89.29%	68.88%	35.60%	57.89%
VBF/sqrt(ggH+bkg)	5.096	3.061	2.478	0.809	2.519

- Background (yy+yj+jj) is scaled to SB data. $\gamma\gamma$ component fraction uses old inclusive result.
- VBF significance is calculated with extrapolated background number.