Status

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Zgam

Zgam plan

- Event selection
  - trigger: ?
  - GRL, detector quality
  - at least one photon and two jets
  - dijet invariant mass

- object definition

photon:

PtEta:25GeV, |eta|<2.37
ID:tight
Iso: to be optimized

jet:

PtEta:25GeV,|eta|<4.5
jet clean
JVT>0.64

Overlap removal: use HGam one?
Based on HGamAnalysisFramwork

Samples

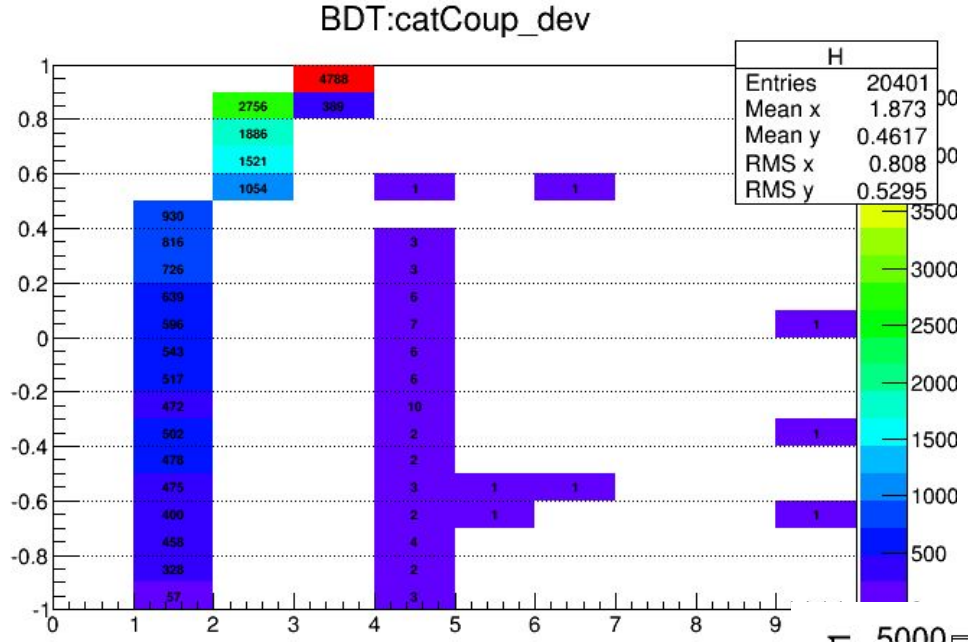
- use EXOT6? select one photon and jet
- Or from xAOD directly
- Signal ggH ->Z(qq)gam,700 750 800 1000GeV
- Bkg
  - exist: ttbar+gamma,gamma+jet
  - not find: Z+jet , Z+gamma
- Bkg decomposition
- Signal and bkg model

Optimization

- mass dependence selection?
- not have any cross section assumption
  - use eff_signal/sqrt(eff_b), but bkg is complicated
- optimize
  - photon isolation
  - dijet combination
  - dijet mass cut

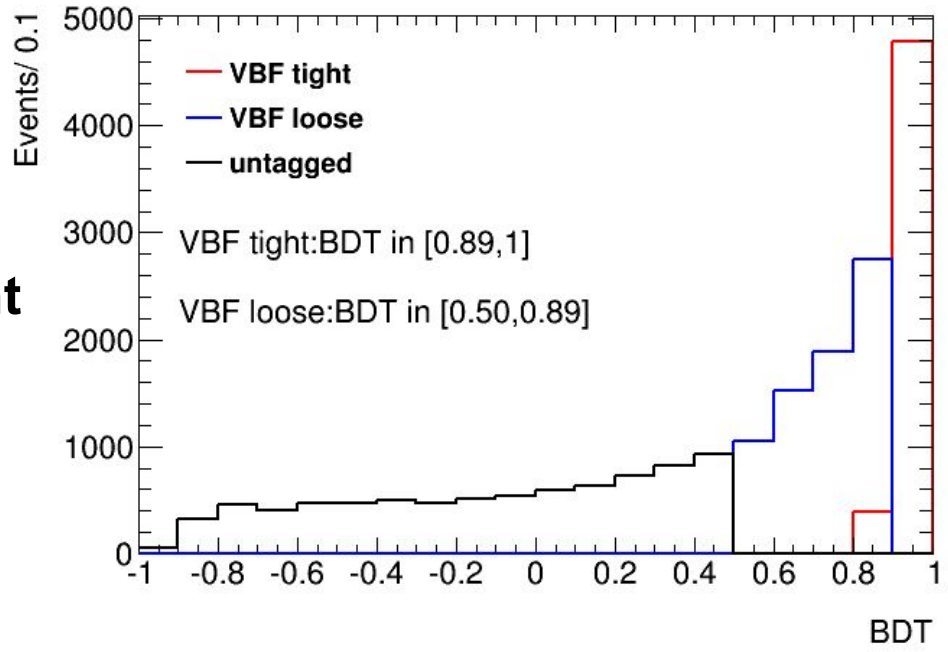
VBF

BDT and category



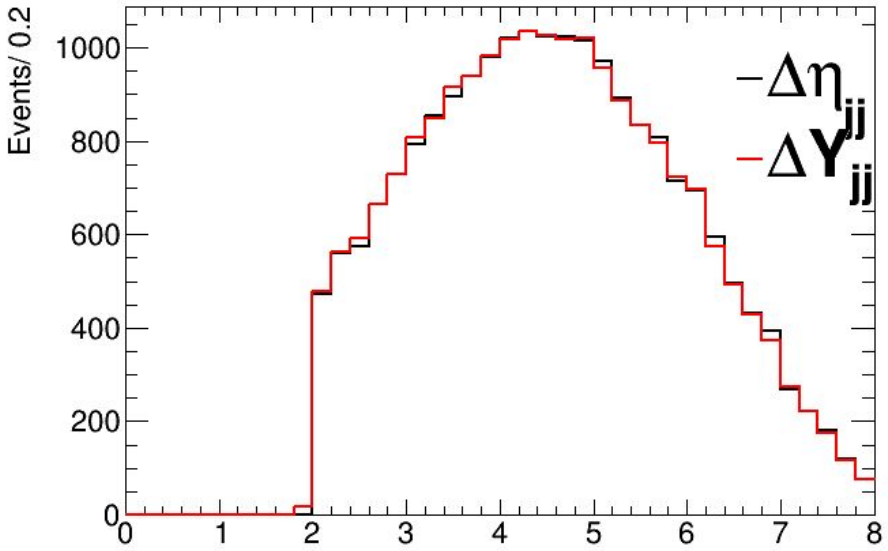
	catCoup_dev	BDT cut
untagged	7937	8003
VBF loose	7217	7221
VBF tight	5177	5177

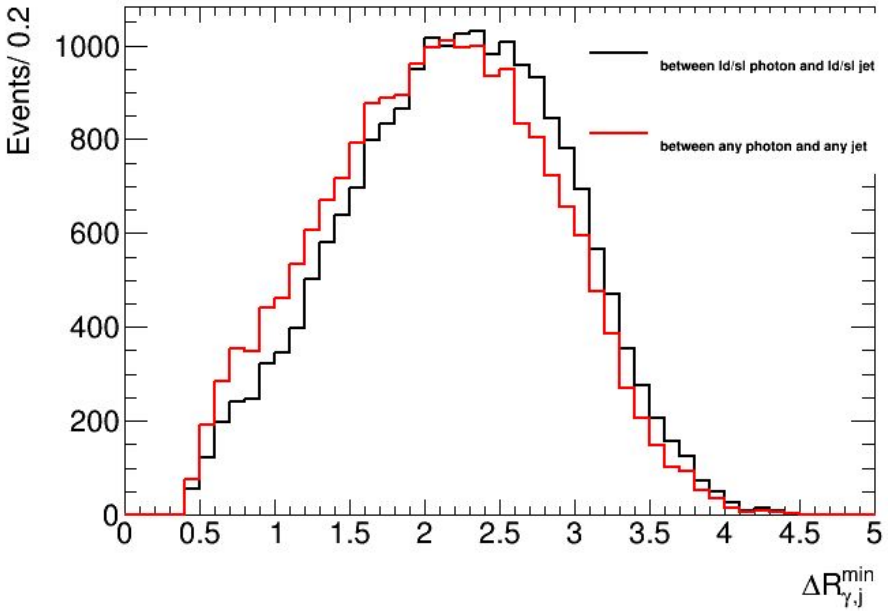
- **Some events with BDT [0.5,0.89] go to other category(VH had and ttH had)**
- **Category denfinition is consistent**



some small differences

	private	h011	influence
dEta_jj	dEta_jj is used	Dy_jj is used	very small
DRmin_y_j	between leading/subleading photon and leading /subleading jet	between any photon and any jet	DR between any photon and any jet is smaller
VBF loose	BDT [0.52, 0.89]	BDT [0.5, 0.89]	affect the significance slightly





Run 2, h011

Category	$\sqrt{s} = 13$ TeV	
ggH	28697	97.5 %
VBF low	180	0.6 %
VBF high	11	
VH hadronic low	449	1.5 %
VH hadronic high	55	0.2 %
VH MET	2	
VH leptonic	3	
VH dileptons	0	
ttH hadronic	22	
ttH leptonic	2	
Total	29421	

Run 1

Category	$\sqrt{s} = 7$ TeV	$\sqrt{s} = 8$ TeV	
Central-low p_{Tt}	4400	24 080	99.2 %
Central-high p_{Tt}	141	806	
Forward-low p_{Tt}	12 131	66 394	
Forward-high p_{Tt}	429	2528	
VBF loose	58	411	0.5 %
VBF tight	7	67	
VH hadronic	34	185	0.2 %
VH $E_{\mathrm{T}}^{\mathrm{miss}}$	14	35	
VH one-lepton	5	38	
VH dilepton	0	2	
$t\bar{t}H$ hadronic	3	15	
$t\bar{t}H$ leptonic	3	5	
Total	17 225	94 566	

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