

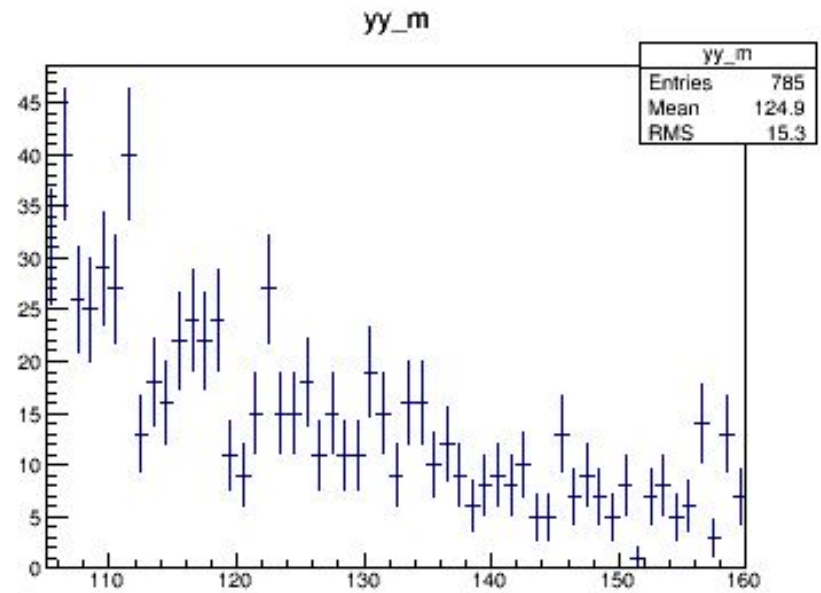
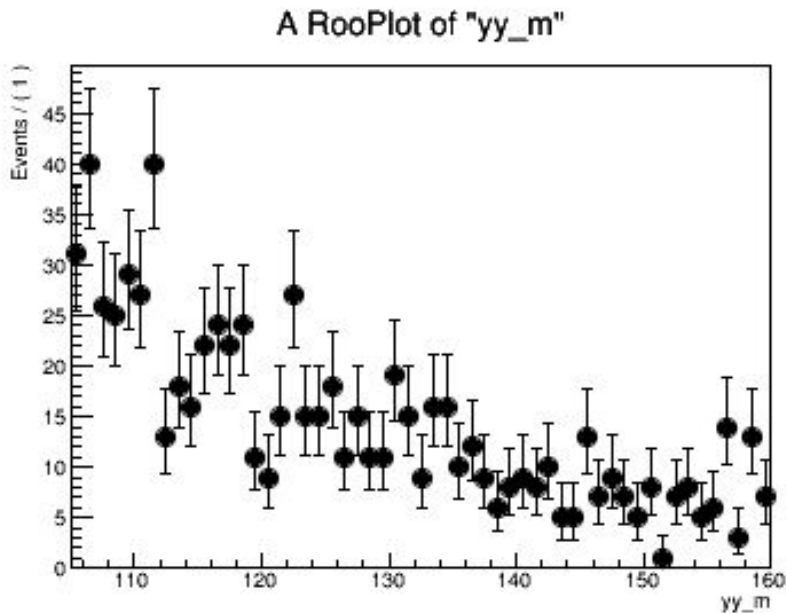
Status

Yu Zhang

08.24

cross check

- 785 events with same event and cfg file
- 612 evens showed on HGam meeting?

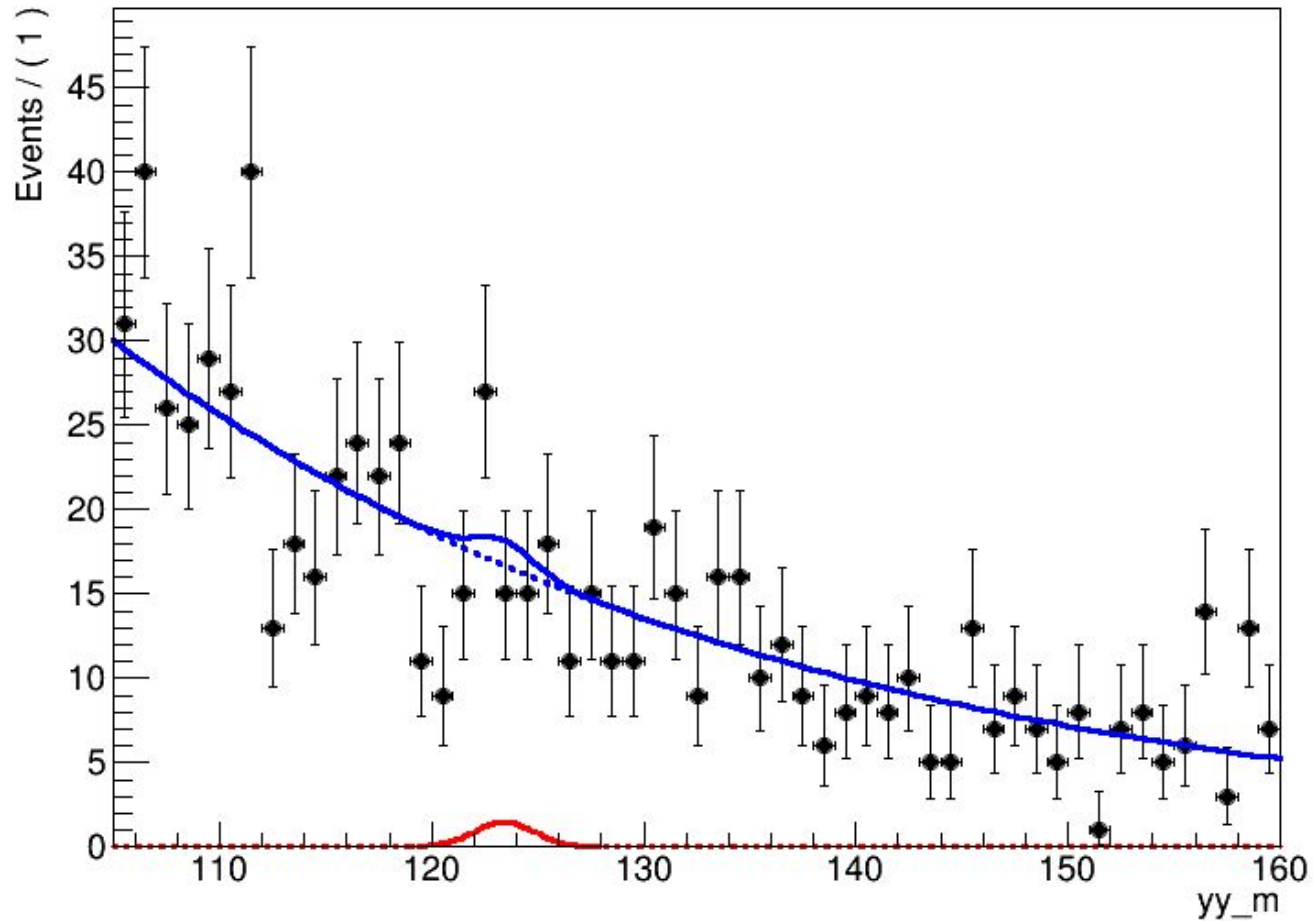


systematic

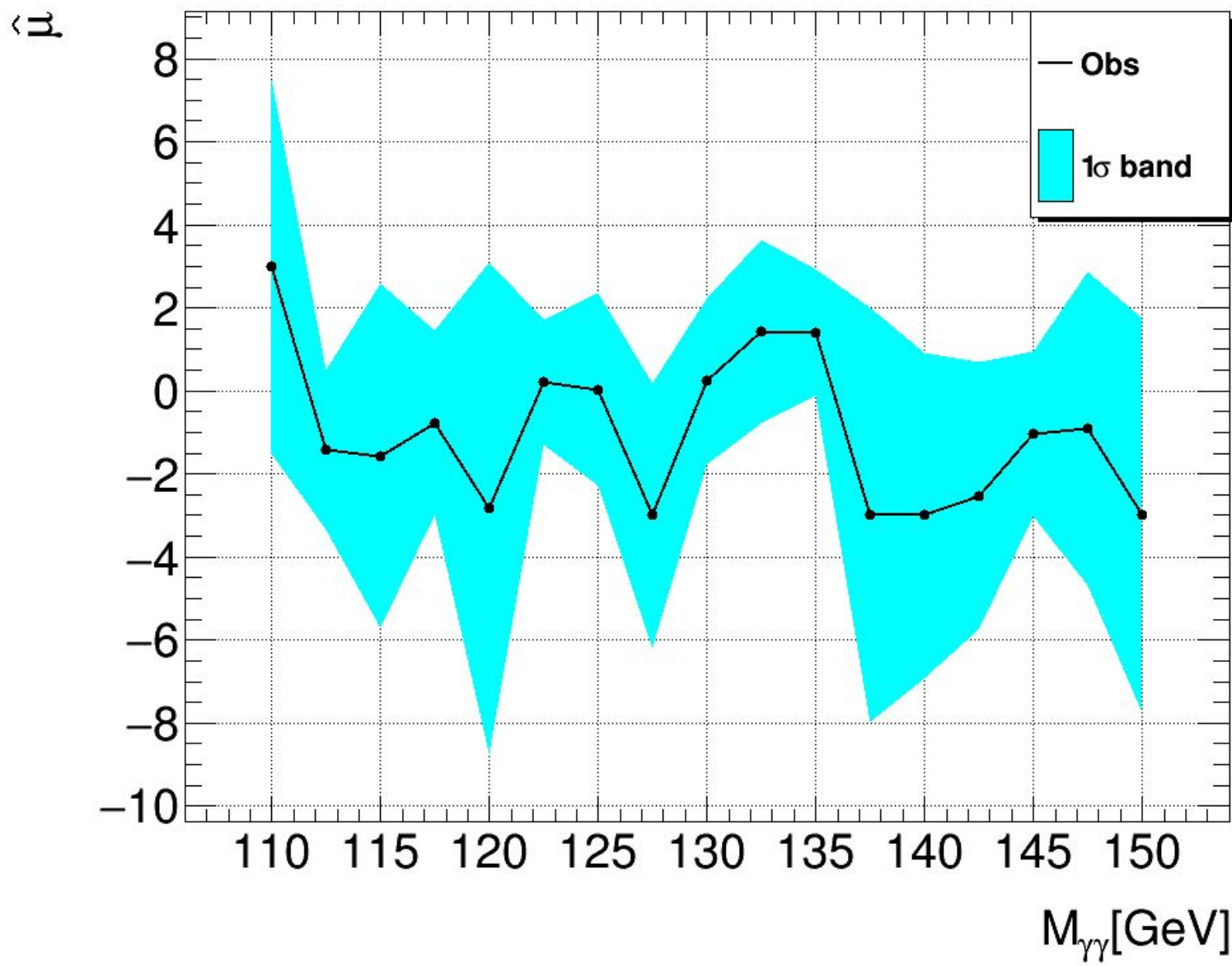
- add theory uncertainty

	QCD scale	pdf+ α_s
<i>ggF</i>	+7.4 -7.9	+7.1 -6.0
<i>VBF</i>	+0.7 -0.7	+3.2 -3.2
<i>WH</i>	+0.7 -1.5	+3.2 -3.2
<i>ZH</i>	+3.8 -3.8	+3.5 -3.5
<i>t$\bar{t}$H</i>	+5.7 -9.3	+8.8 -8.8
<i>b$\bar{b}$H</i>	+14.0 -24.0	+6.1 -6.1

A RooPlot of "yy_m"



- $m_H = 123.5 \pm 1.5, \mu = 1.0 \pm 1.5$
- $85 \text{ pb}^{-1}, 785 \text{ events}$



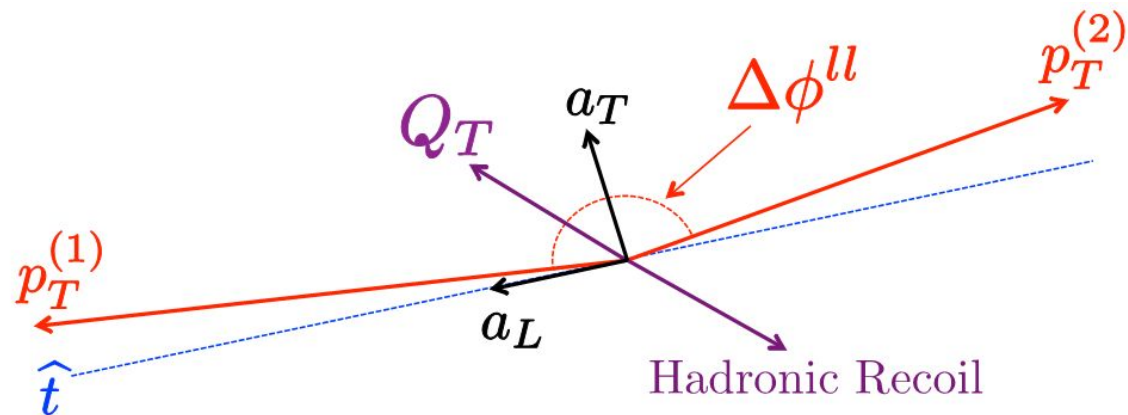
MVA preparation

- VBF character

two forward jets with high p_T and great Y separation, higgs in central region

- 6 variables: $m_{jj}, \Delta\eta_{jj}, P_{Tt}, \Delta\phi_{\gamma\gamma, jj}, \Delta R^{\min}_{\gamma, j}, \eta^*$

- $\eta^* = \eta_{\gamma\gamma} - 0.5 * (\eta_{j1} + \eta_{j2})$ $P_{Tt} = \frac{|(P_{T\gamma1} + P_{T\gamma2}) \times (P_{T\gamma1} - P_{T\gamma2})|}{|P_{T\gamma1} - P_{T\gamma2}|}$



P_{Tt} formular

- suppose:
- $P_{T\gamma 1}=(p_{x1},p_{y1},0), P_{T\gamma 2}=(p_{x2},p_{y2},0)$

$$P_{Tt} = \frac{|(P_{T\gamma 1} + P_{T\gamma 2}) \times (P_{T\gamma 1} - P_{T\gamma 2})|}{|P_{T\gamma 1} - P_{T\gamma 2}|}$$

$$P_{Tt} = \frac{|(p_{x1} + p_{x2}) * (p_{y1} - p_{y2}) - (p_{y1} + p_{y2}) * (p_{x1} - p_{x2})|}{\sqrt{(p_{x1} - p_{x2})^2 + (p_{y1} - p_{y2})^2}}$$

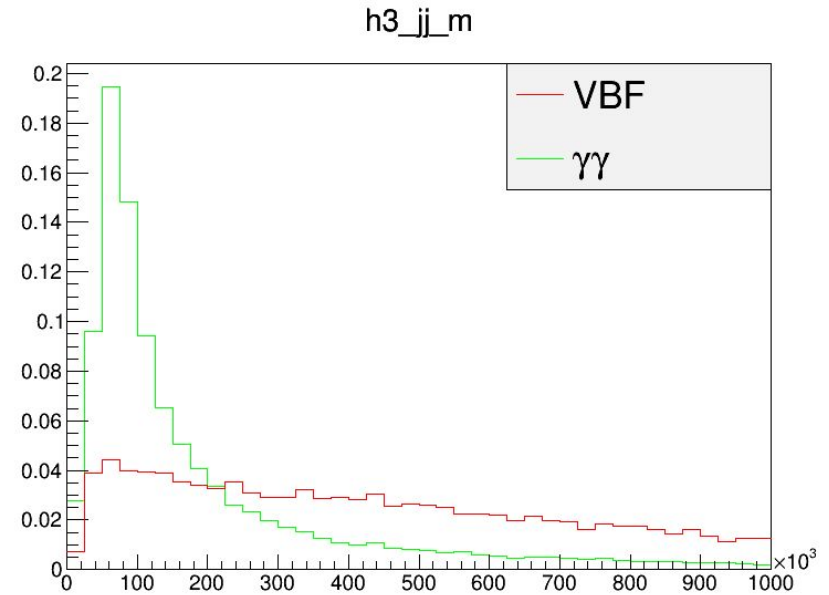
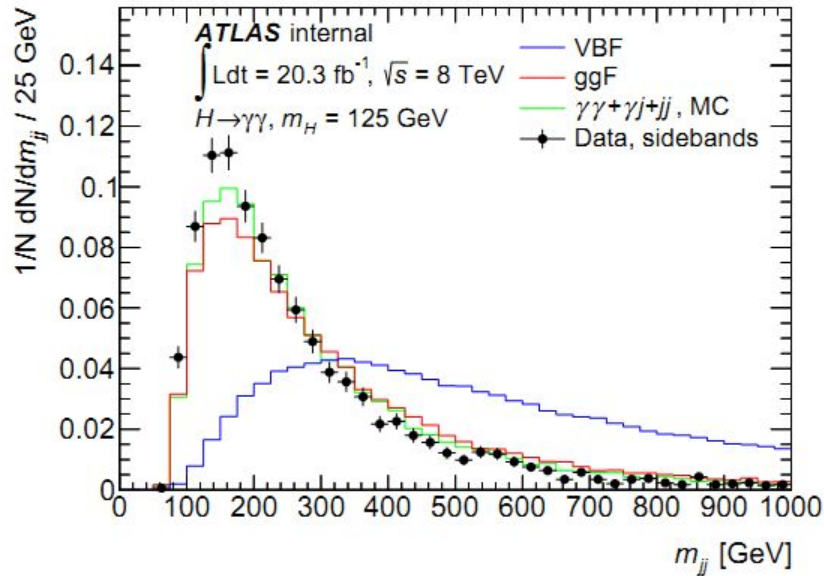
MC sample

- MC15 list
<https://twiki.cern.ch/twiki/bin/viewauth/AtlasProtected/CentralMC15ProductionList>
- VBF H->gamgam
 - mc15_13TeV.341001.PowhegPythia8EvtGen_CT10_AZNLOCTEQ6L1_VBFH125_gamgam.merge.DAOD_HIGG1D1.e3806_s2608_s2183_r6630_r6264_p2363/
 - mc15_13TeV.341001.PowhegPythia8EvtGen_CT10_AZNLOCTEQ6L1_VBFH125_gamgam.merge.DAOD_HIGG1D1.e3806_s2608_s2183_r6630_r6264_p2377/
- diphoton background
 - mc15_13TeV.302521.Pythia8EvtGen_A14NNPDF23LO_2DP20_Mass_100_160.merge.AOD.e4045_s2608_s2183_r6630_r6264/
 - mc15_13TeV.302521.Pythia8EvtGen_A14NNPDF23LO_2DP20_Mass_100_160.merge.AOD.e4045_s2608_s2183_r6765_r6282/
- I am not sure which dijet and γ +jet samples to use.....

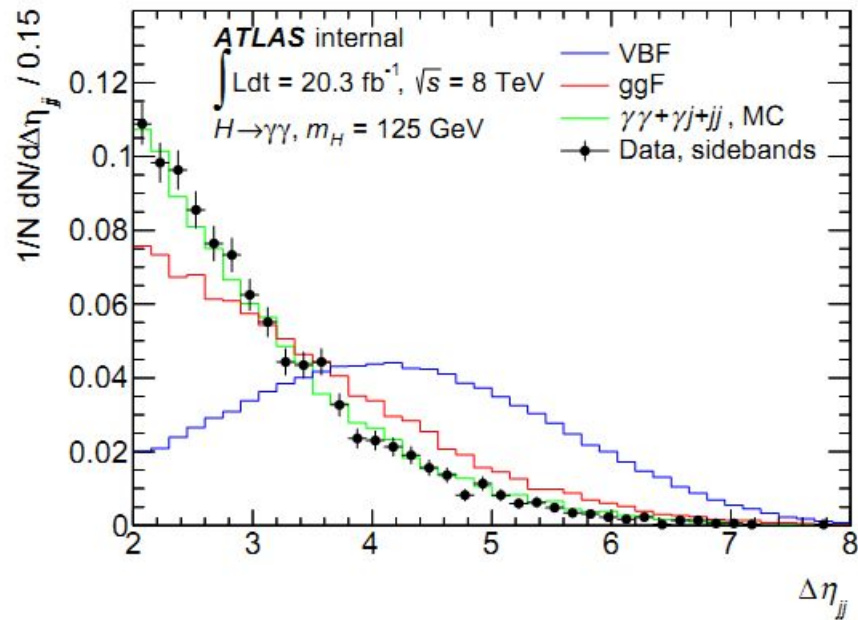
selection on jet

- PtEta:pT>25GeV,|eta|<4.4
- JVT:0.64
- overlap removal
- two jets

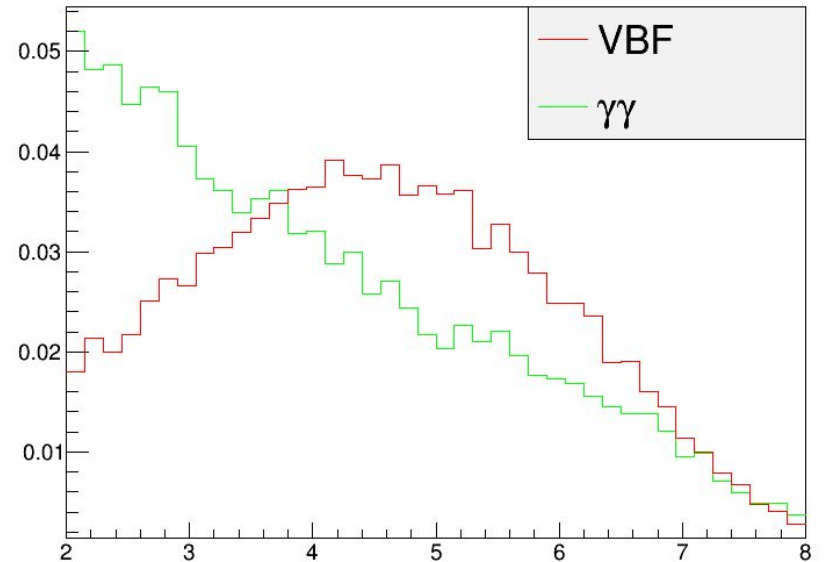
jj_m>400(520)GeV



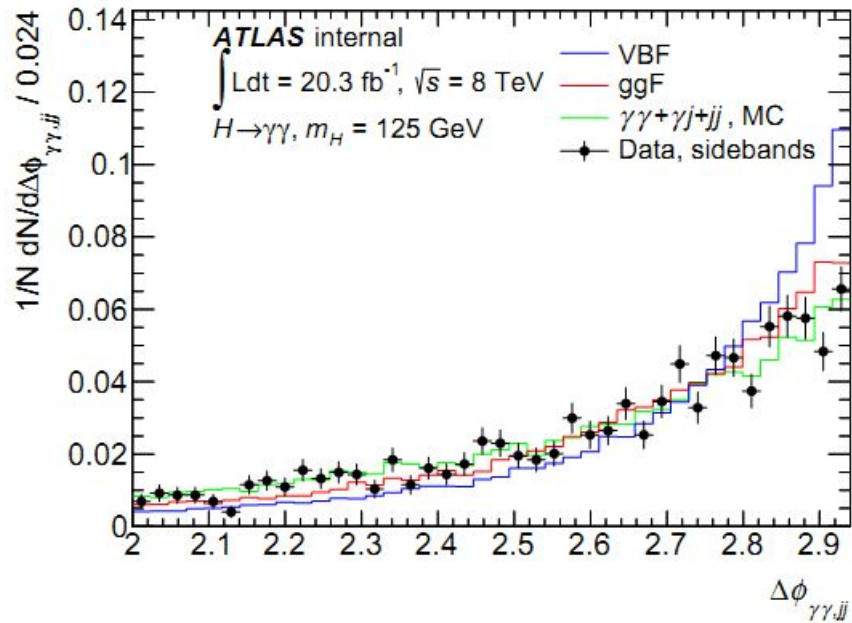
jj_DeltaEta



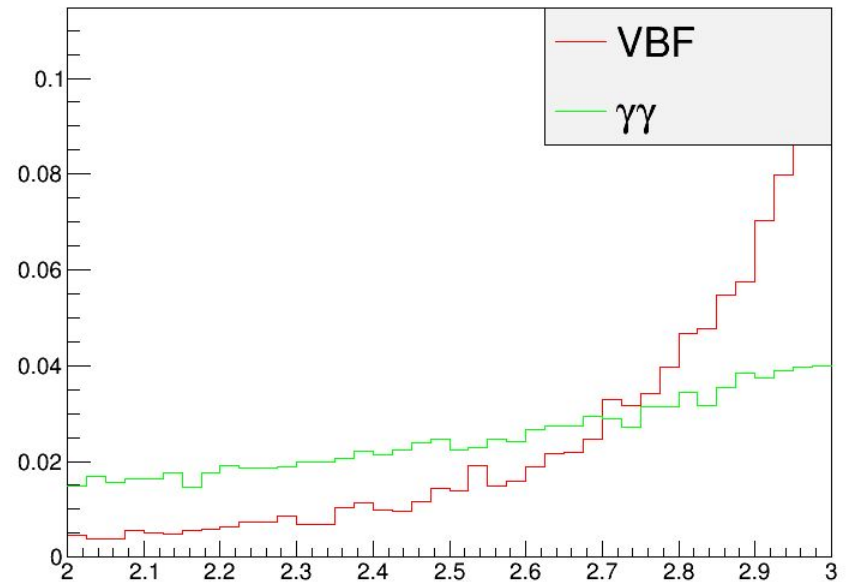
h3_jj_DeltaEta



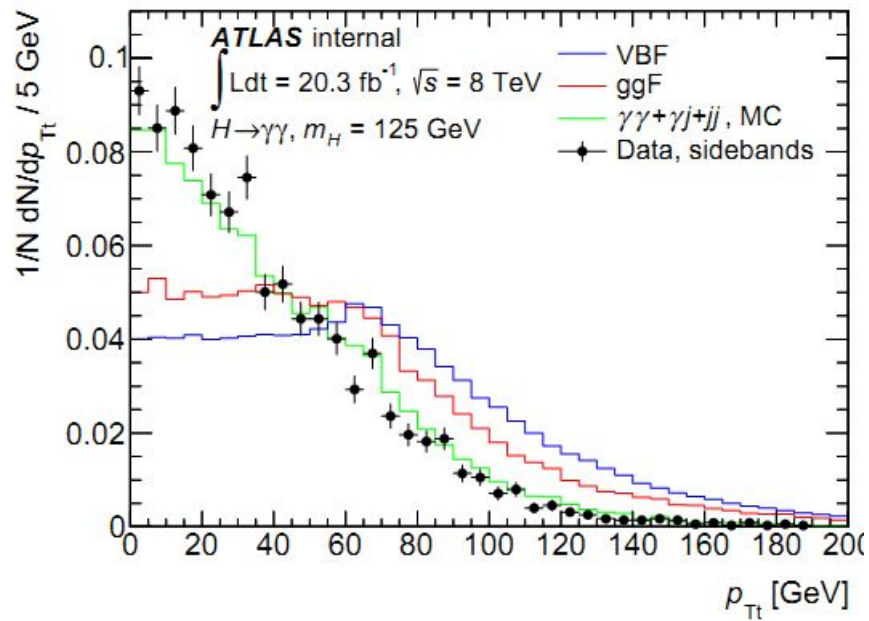
yy_jj_DeltaPhi>2.6



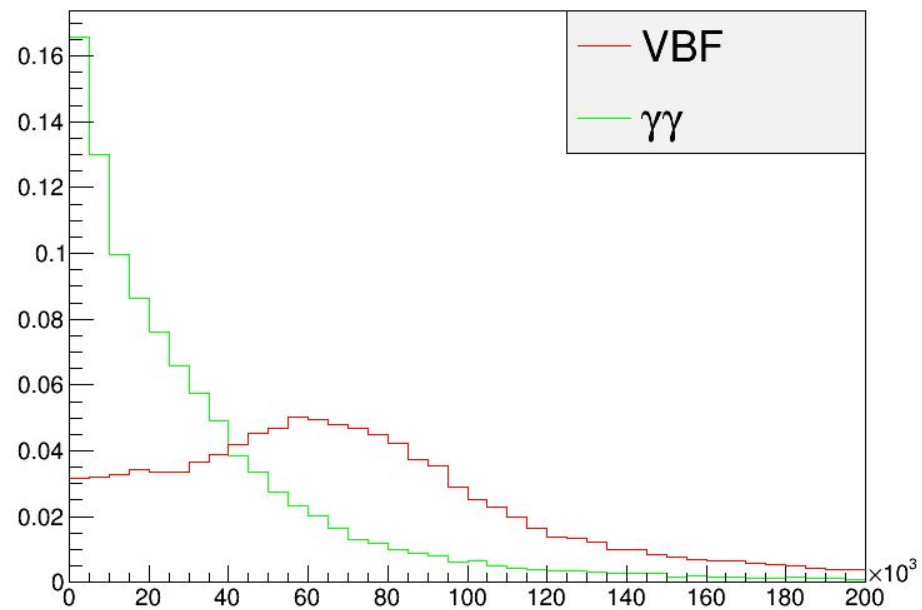
h2_yy_jj_DeltaPhi



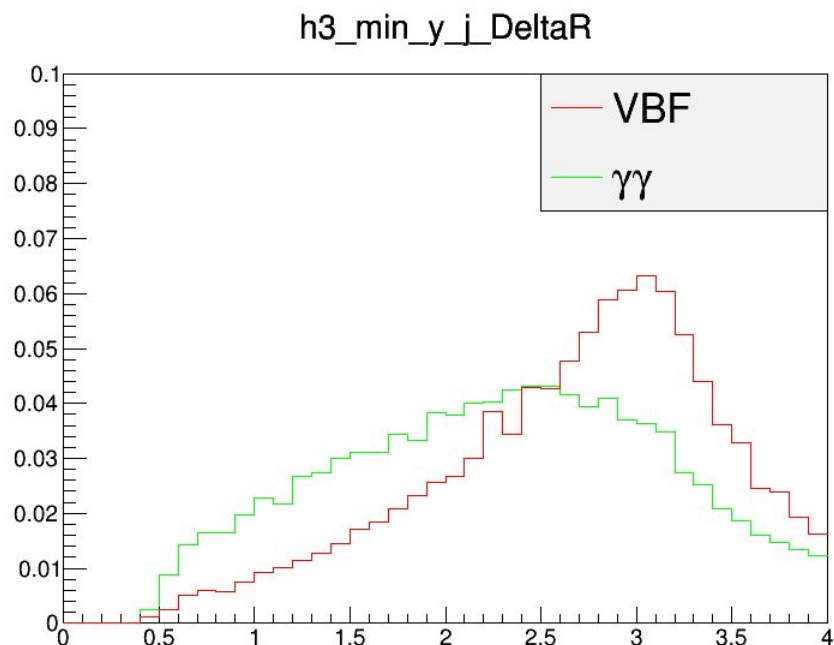
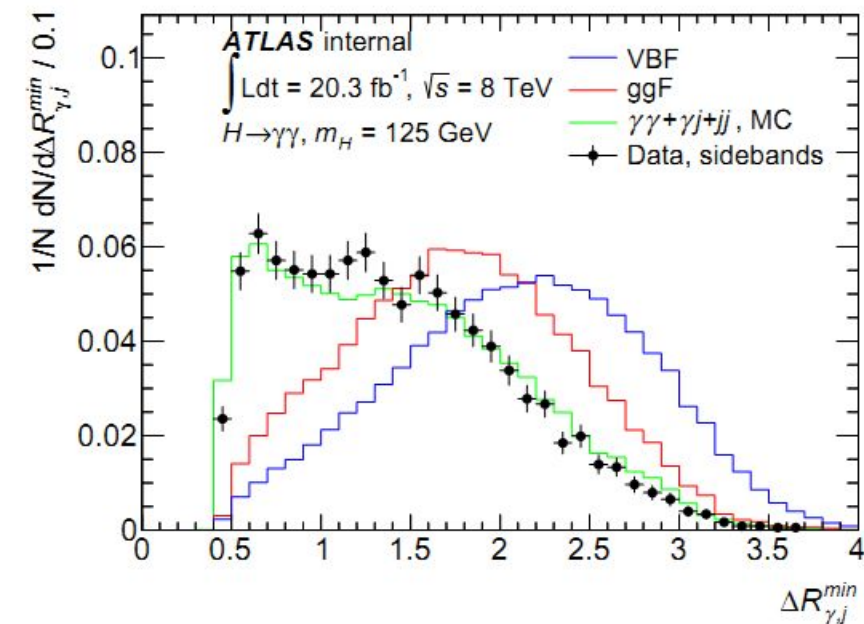
pTt



h3_yy_pTt

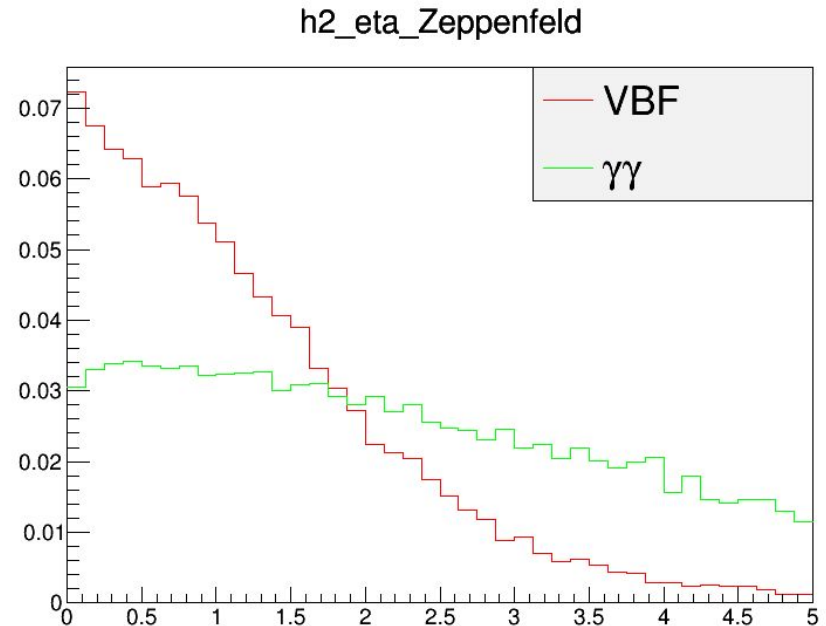
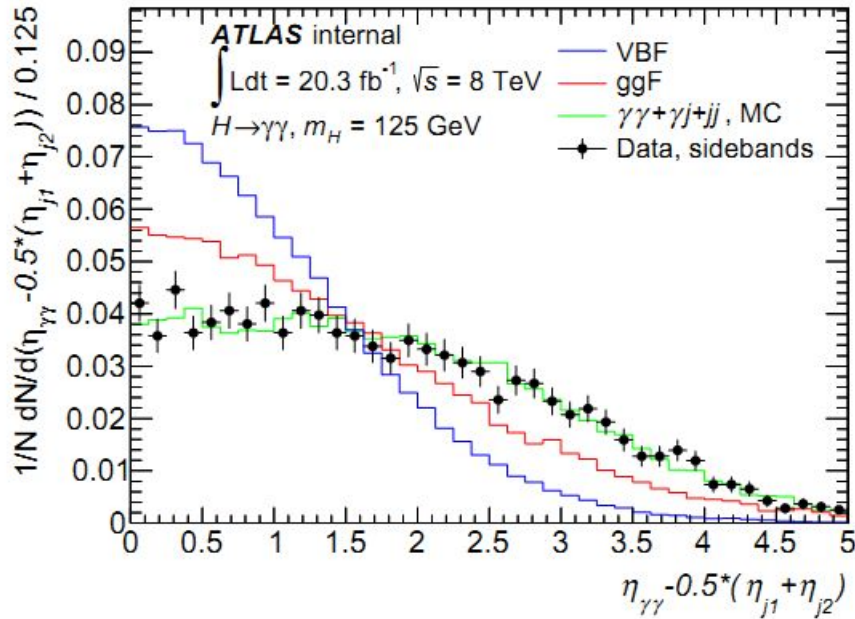


tight: $\Delta R^{\min}_{\gamma,j} > 2$



- $\Delta R^{\min}_{\gamma,j} = \min(y1.\text{DeltaR}(j1), y2.\text{DeltaR}(j2))$

tight:eta_Zeppenfeld<2.4



qualification task

- ITK only simulation->digitization->reconstruction
- check out InDetPhysValMonitoring and draw some plots
- need to talk with Andreas to understand the plot