13TeV VBF H->$\gamma\gamma$ Analysis

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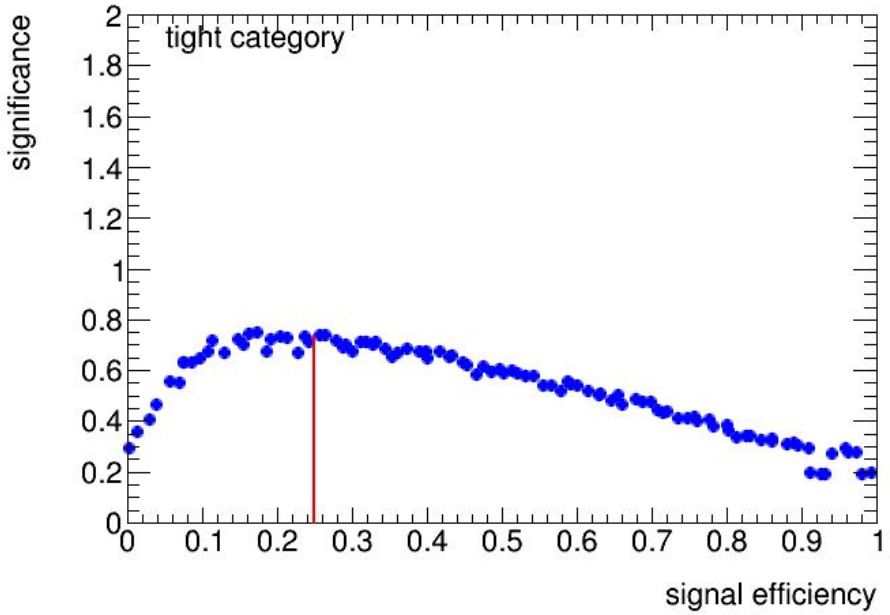
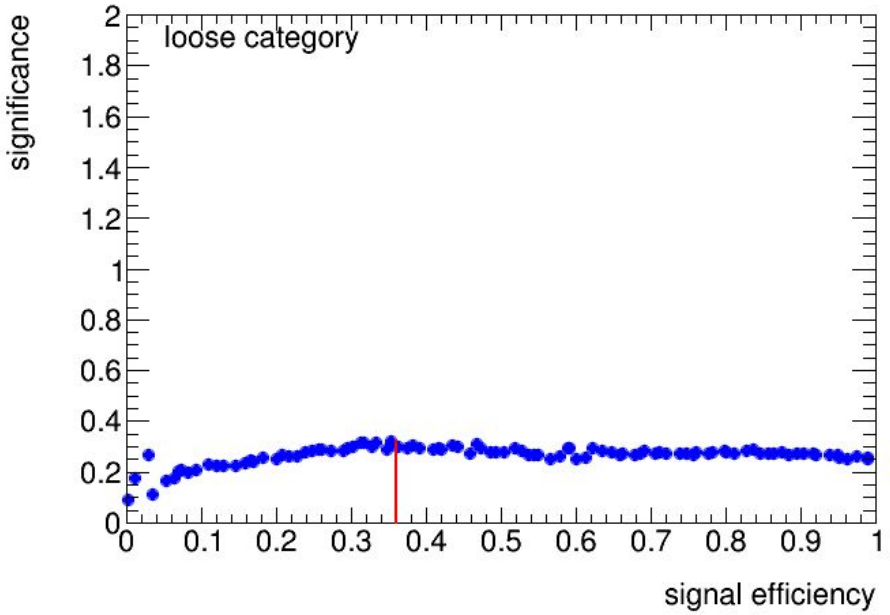
Introduction

- Samples
  - data:1.72fb^{-1}
  - VBF MC: 179383
  - Sherpa $\gamma\gamma$+jets: 210926
  - RevID&RevIso: 15790
- Cut-based optimization
- MVA otimization

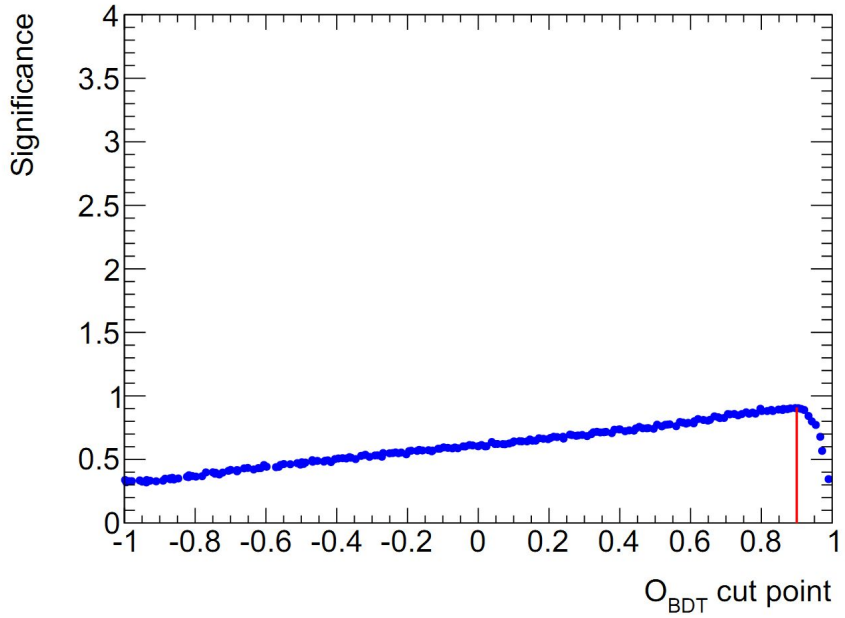
cut-based optimization

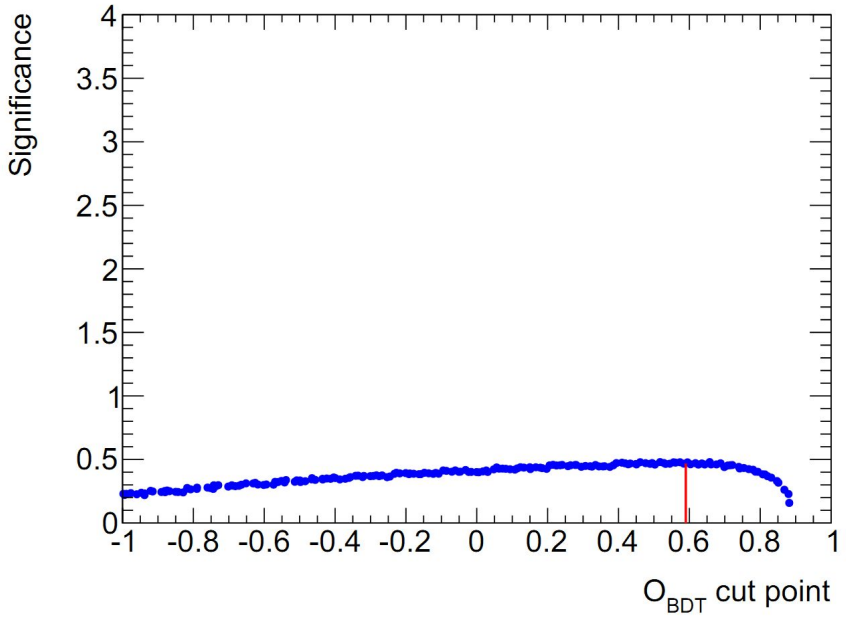




- Selection
  - tight:m_{jj}>524GeV,$\Delta\eta_{jj}$>2.63,$\Delta\Phi_{\gamma\gamma,jj}$>3.02,$\Delta R_{\gamma,j}^{min}$>1.76,$\eta^{*}$>-6
  - loose:m_{jj}>1051GeV,$\Delta\eta_{jj}$>-∞,$\Delta\Phi_{\gamma\gamma,jj}$>-$\infty$
  - Run1:
    - ✓$\Delta\eta_{jj}$>2.8,m_{jj}>520GeV,$\Delta\Phi_{yy,jj}$>2.6,η^{*}<2.4,$\Delta R_{y,j}^{min}$>2
    - ✓$\Delta\eta_{jj}$>2.8,m_{jj}>400GeV,$\Delta\Phi_{yy,jj}$>2.6

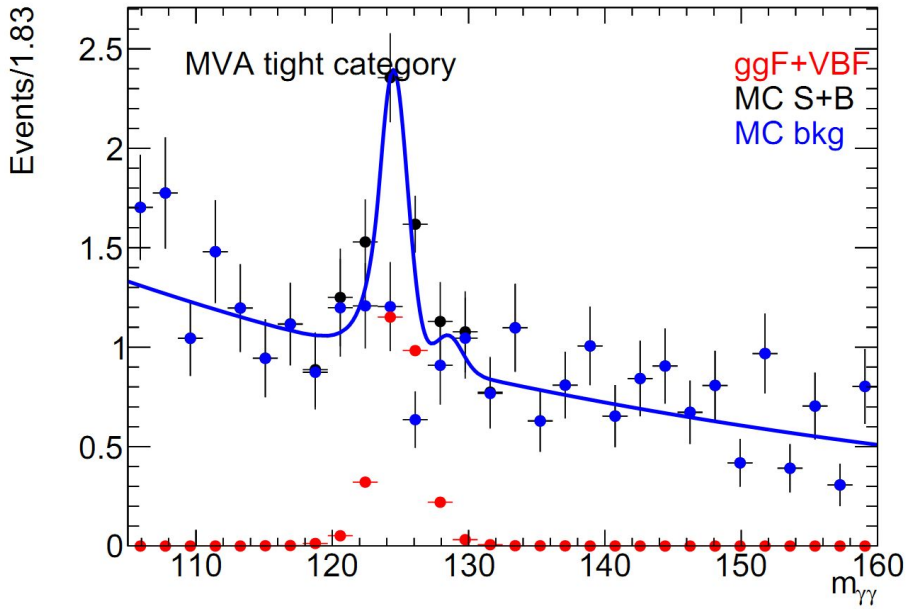
MVA optimization

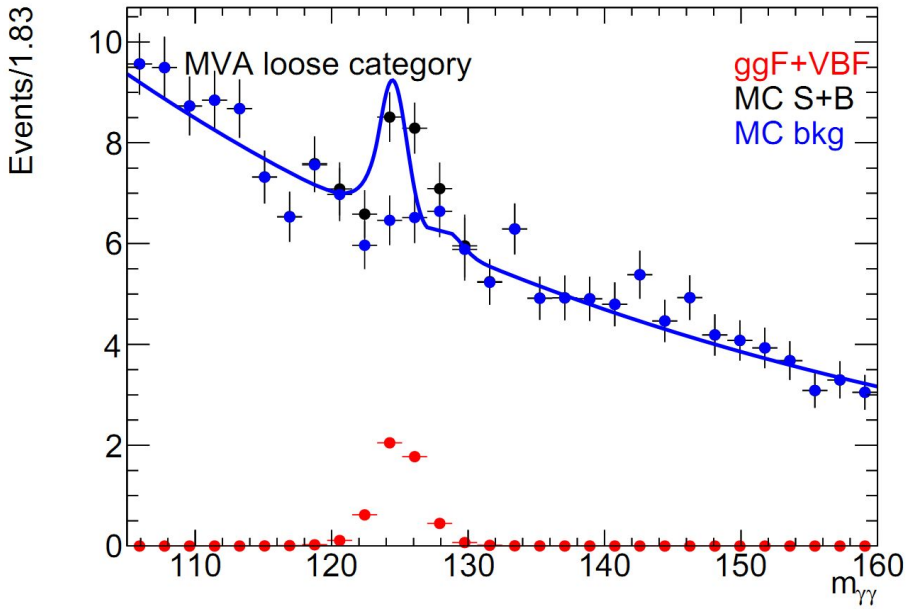




- tight category:[0.9,1.0]
- loose category:[0.59,0.9]

fit for MVA category



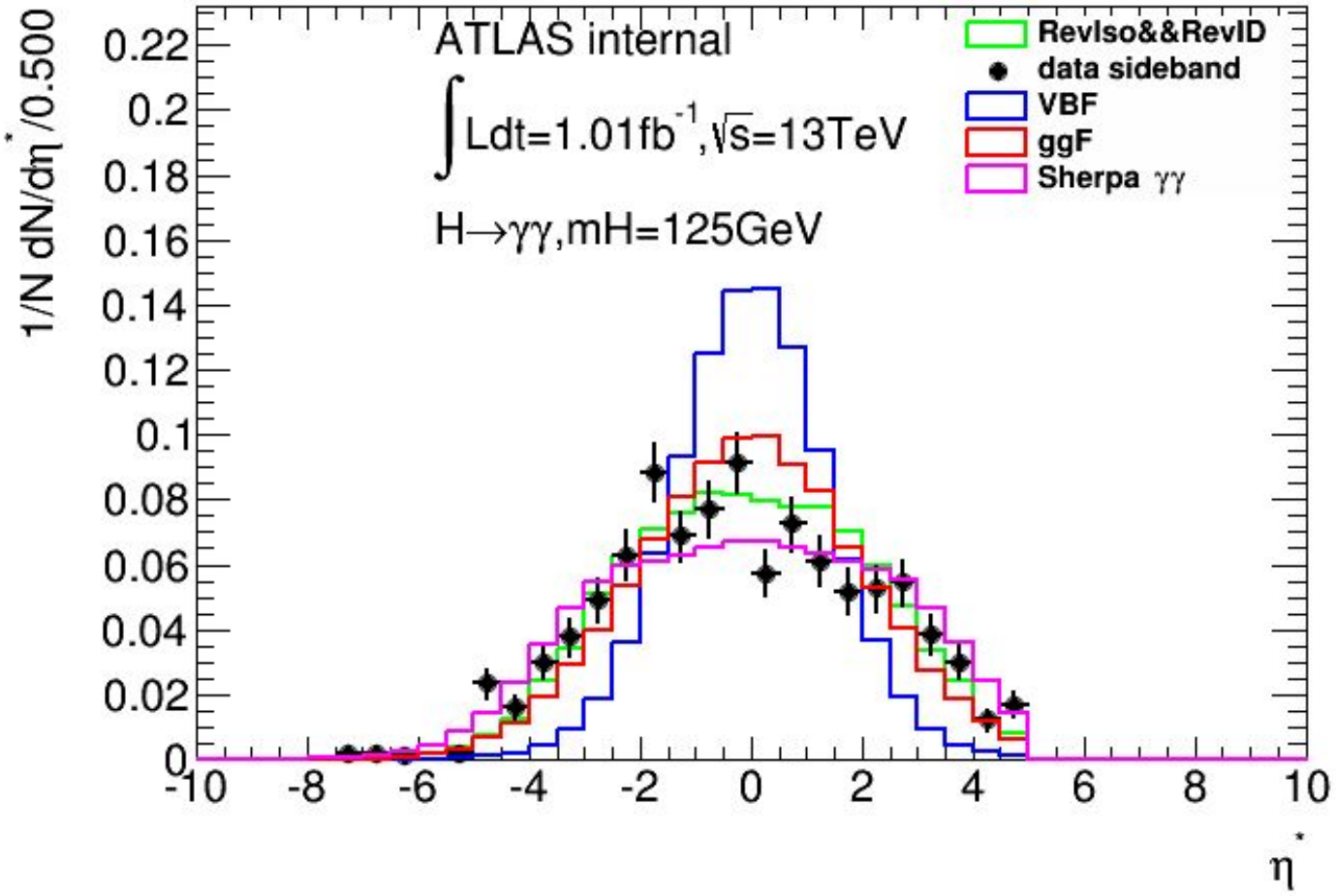


- fit with CB+GA function
- mean of GA is biased due to bkg shape
- tight:mu_VBF=0.96+/-1.1
- loose:mu_VBF=0.96+/-1.7

to do list

- begin to look at other variables
- optimize the MVA configuration
- systematic?

back up


ATLAS internal
∫Ldt=1.01fb-1,√s=13TeV
H→γγ,mH=125GeV
RevIso&&RevID
data sideband
VBF
ggF
Sherpa γγ
1/N dN/dη*/0.500
η*
0.22
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
-10
-8
-6
-4
-2
0
2
4
6
8
10