

statistic result

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Introduction

- Lumi
 - Current: 85pb^{-1}
 - Expect: 4000pb^{-1}
- Signal and background scale
 - cross section: [Link](#)
 - signal scale factor:
 - $\text{Lumi} \times \text{Xsec} \times \text{br} / \text{MC_size}$
 - bkg scale factor:
 - sherpa $\gamma\gamma$: $4000/85 \times 0.795 \times N_{\text{data}, N_{\text{jet}} > 1} / N_{\text{MC}, N_{\text{jet}} > 1}$
 - RevIso&RevID: $4000/85 \times 0.205 \times N_{\text{data}, N_{\text{jet}} > 1} / N_{N_{\text{jet}} > 1}$
- Pdf
 - signal: CB+GA
 - bkg: Exponential
- use run1 cut-base to select VBF category

cross section

	8TeV($m_H=125\text{GeV}$)	13TeV($m_H=125\text{GeV}$)	ratio
ggF	19.27pb	43.92pb	2.28
VBF	1.578pb	3.748pb	2.38
WH	0.7046pb	1.380pb	1.96
ZH	0.4153pb	0.8696pb	2.09
ttH	0.1293pb	0.5085pb	3.93
all	22.10pb	50.43pb	2.28

cut efficiency

	initial	pre	mass	Njet	loose	weighted	tight	weighted
ggF	1921000	965353	624388	153069	11094	2.8408	4091	1.048
VBF	984000	506394	324325	221417	68775	2.93395	46414	1.98
WH	492000	22208	13702	8116	171	0.053719	23	0.007
ZH	498000	22482	13800	8346	154	0.0301182	23	0.004
ttH	498000	29041	15598	15496	344	0.0393403	48	0.005
sherpa	992000	585150	260040	72751	3257	299.806	763	70.234
Rev			17759	4821	231	19.9338	47	4.056

significance ---number counting

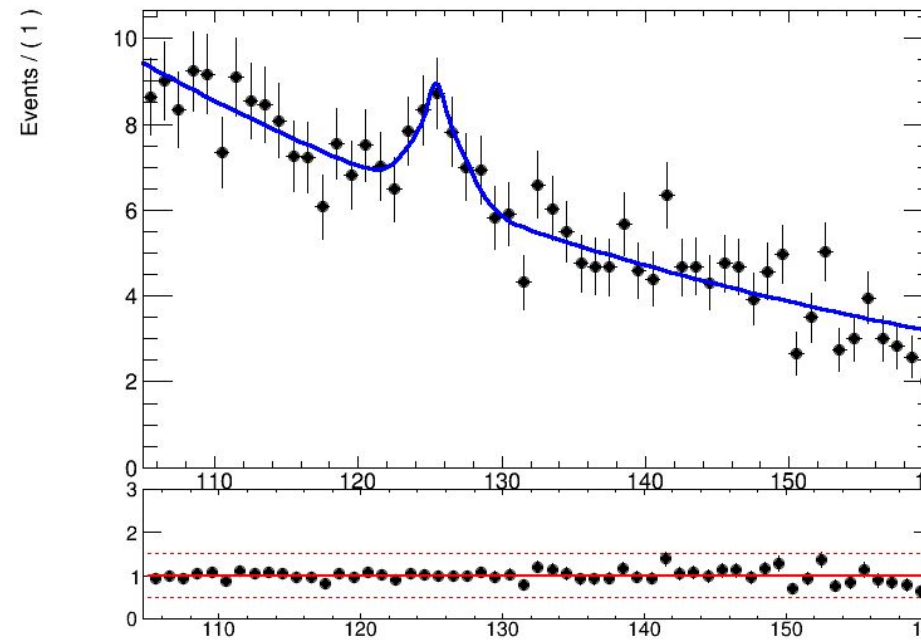
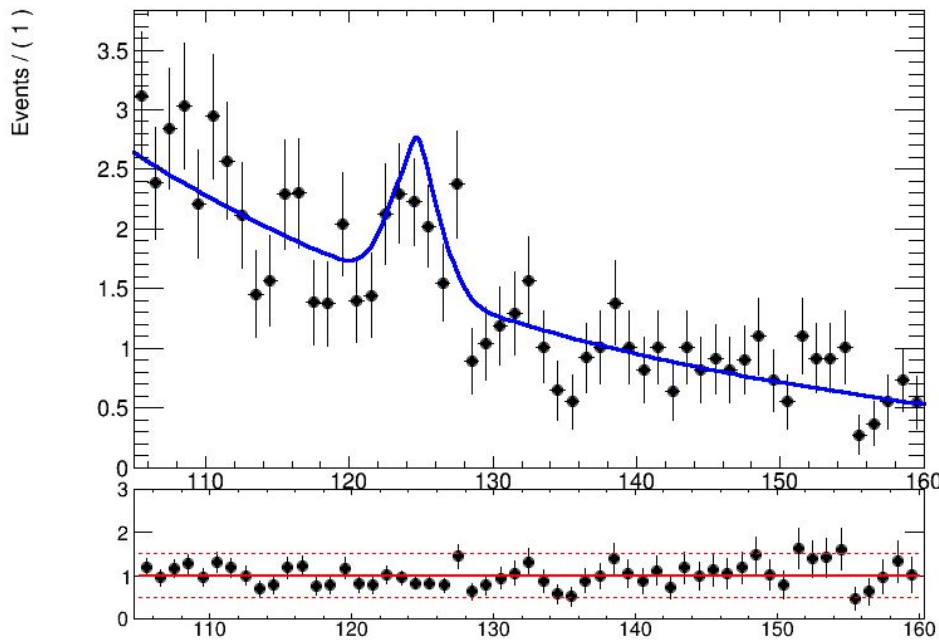
- signal region: $m_{\gamma\gamma}$ [121,131]GeV

	tight	weighted	loose	weighted	all	weighted
ggF	3990	1.022	10804	2.767	14794	3.789
VBF	45411	1.937	66780	2.849	112194	4.786
Sherpa	141	12.98	667	61.40	808	74.37
Rev	14	1.208	55	4.746	69	5.954

$$\sigma_{VBF} = \sqrt{2 \times (N_{VBF} + N_{ggF} + N_{Background}) \times \ln \left(1 + \frac{N_{VBF}}{N_{ggF} + N_{Background}} \right) - N_{VBF}}$$

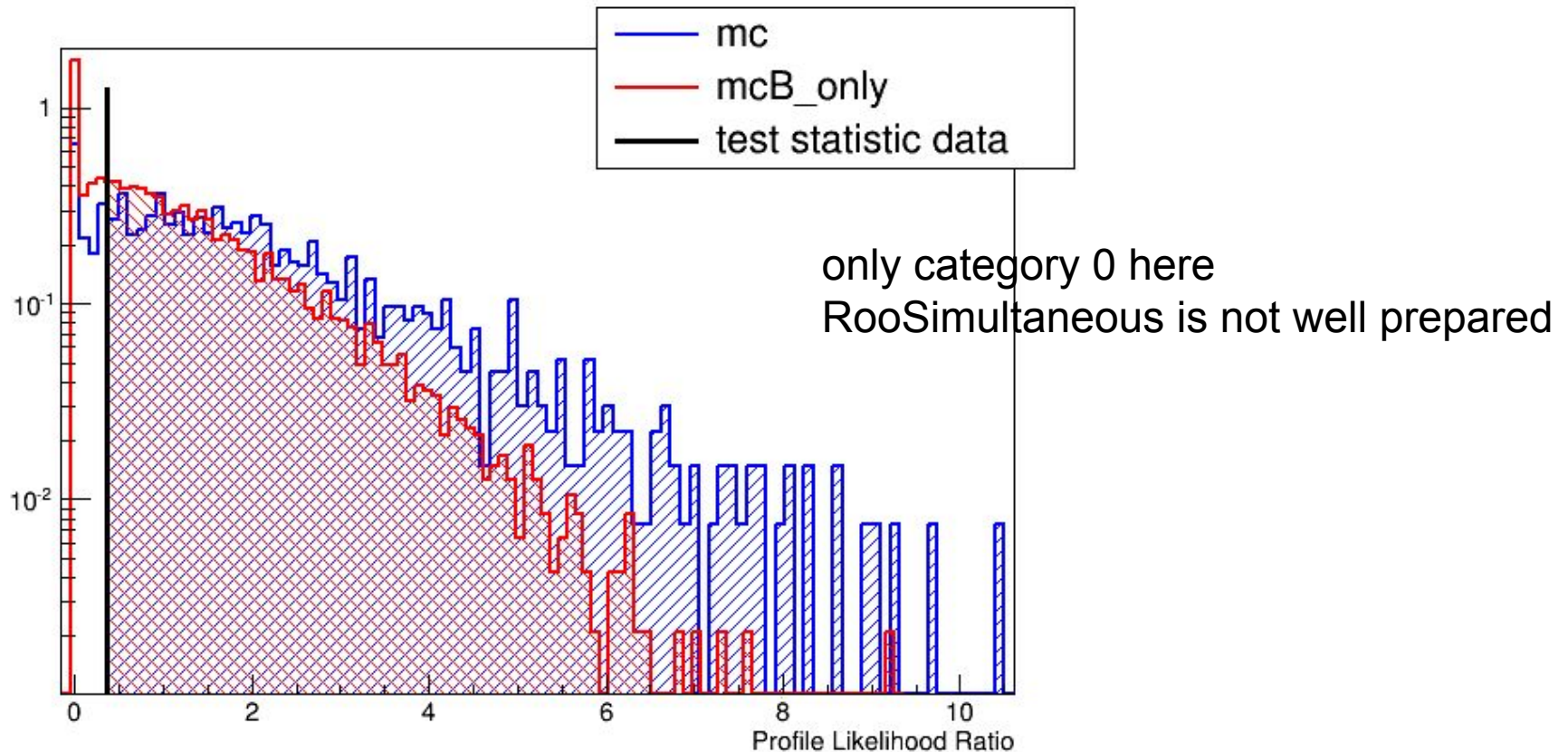
	tight	loose	all
sigma	1.04185	1.69603	1.98878

fit with weighted dataset



- parameter range needs to be optimized
- huge statistic error
- cut based selection efficiency is low
- MVA will be better?

significance



- very bad result!
- will correct it soon
- welcome suggestions

to do list

- current selection threshold is run1 ,try to get run2 cut-based and MVA threshold
- StandardHypoTestDemo.C:a little problem with RooSimultaneous,try to fix it