

Weekly

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Note

- Supporting note:
 - Signal optimization;
 - Preliminary limits;
- Combination note:
 - First draft;
 - Introduction, sub-channels,
 - correlation checks,
 - combined results.

7 **Contents**

8 **1 Introduction**

9 **2 Sub-channels**

10 **3 Combination**

11 **4 Uncertainties**

12 **5 Limit setting**

13 **6 Results**

14 **7 Interpretation**

15 **Appendix**

Signal optimization

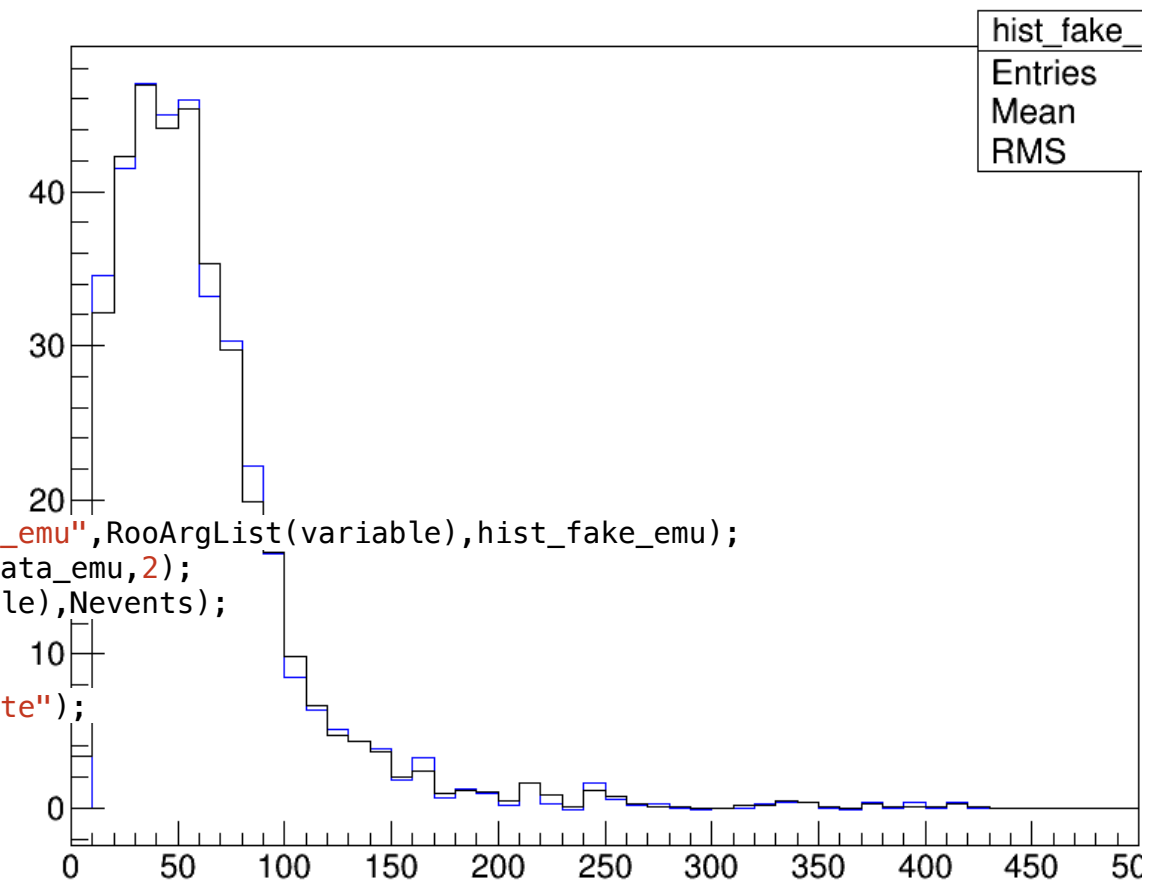
- Re-do signal optimization with lumi=36.5 ifb;
- 6 kinematic variables being used:
 - MET, m_ll, mindR_l2j, mindR_l1j, m_l1jj, m_all;
- TMVA::CutsSA method is used;
- All backgrounds are input in training:
 - promptSS;
 - Vgam;
 - QmisiD;
 - Fakes(pseudo events);
- Final cuts are decided based on $\text{effS}/\sqrt{\text{effB}}$.

Example: $m_H=260\text{GeV}$, ee channel

- Due to negative weights and small statistics of fakes backgrounds, first pseudo events are made based on pdf of fakes;

```

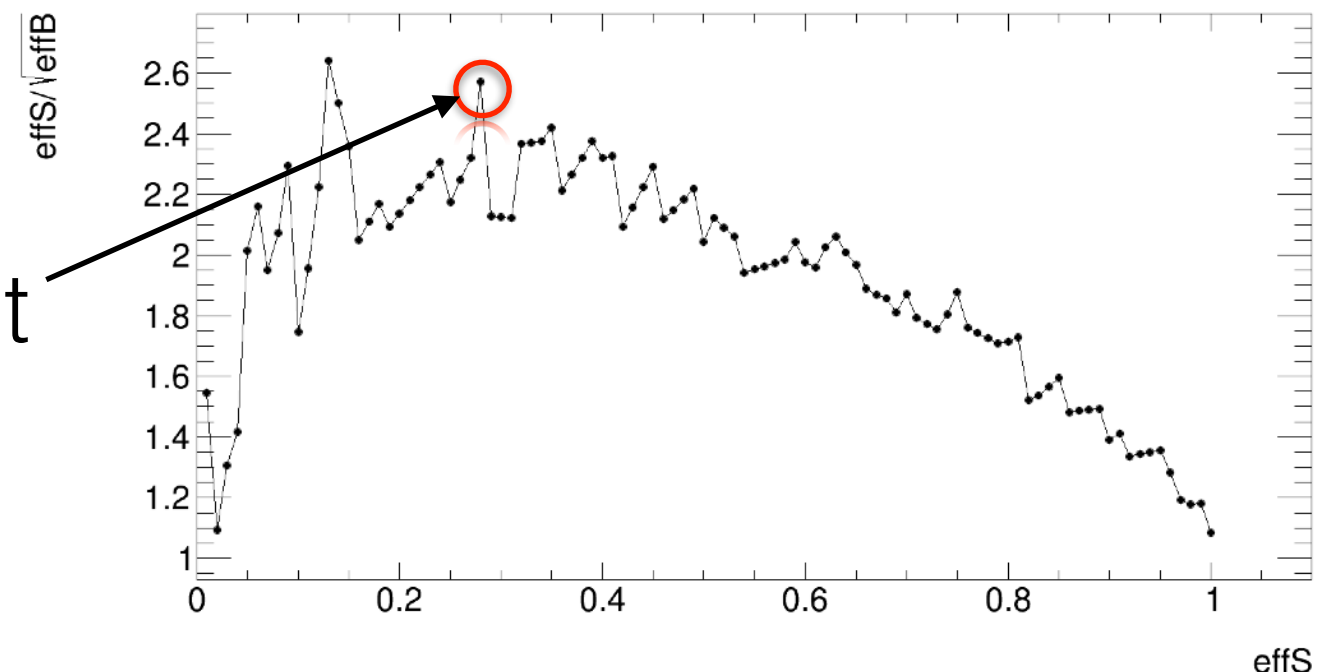
RooDataHist* histdata_emu=new RooDataHist("histdata_emu","histdata_emu",RooArgList(variable),hist_fake_emu);
RooHistPdf histpdf_emu("histpdf_emu","histpdf_emu",variable,*histdata_emu,2);
RooDataSet *pseudodata_emu = histpdf_emu.generate(RooArgSet(variable),Nevents);
...
//save pseudo events to root files
TFile *PseudoFakes_ee=new TFile("temp/PseudoFakes_ee.root","recreate");
TTree* tree_ee=(TTree*)pseudodata_ee->tree();
tree_ee->Write();
PseudoFakes_ee->Close();
    
```



- Then input pseudo fakes to MVA training;

- Scan $\text{effS}/\sqrt{B}$ vs. effS :

- Some tuning by hand are performed to decide final values of cuts.
- selected point



Optimization summary

Mass	Channel	MET	m_ll	mindR_l2j	mindR_l1j	m_l1jj	m_all
Non-res	ee						
	mumu						
	emu						
260GeV	ee	>35	<125	<3.2	<2.5	<120	60<X<4800
	mumu						
	emu						
300GeV	ee	>40	<150	<3.3	<2.0	<120	50<X<4850
	mumu						
	emu						
400GeV	ee						
	mumu						
	emu						
500GeV	ee						
	mumu						
	emu						

Tricky! Not fully decided!

Limits

- To get final numbers, simultaneous scan being used temporarily!
- Without systematic uncer., only statistical uncertainties;
- Comparable with WWyy results;
- Left: WWyy, Right: WWWW.

