



Cuts on electron

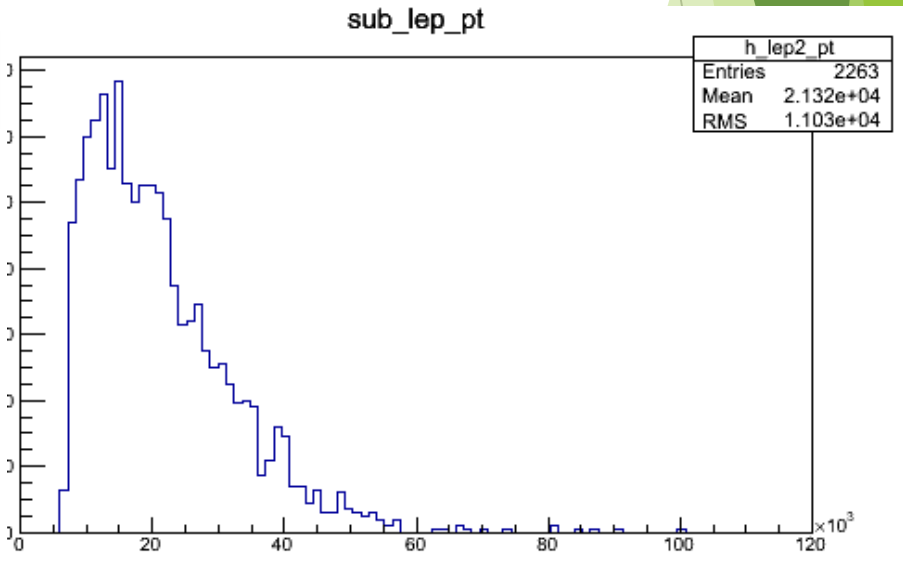
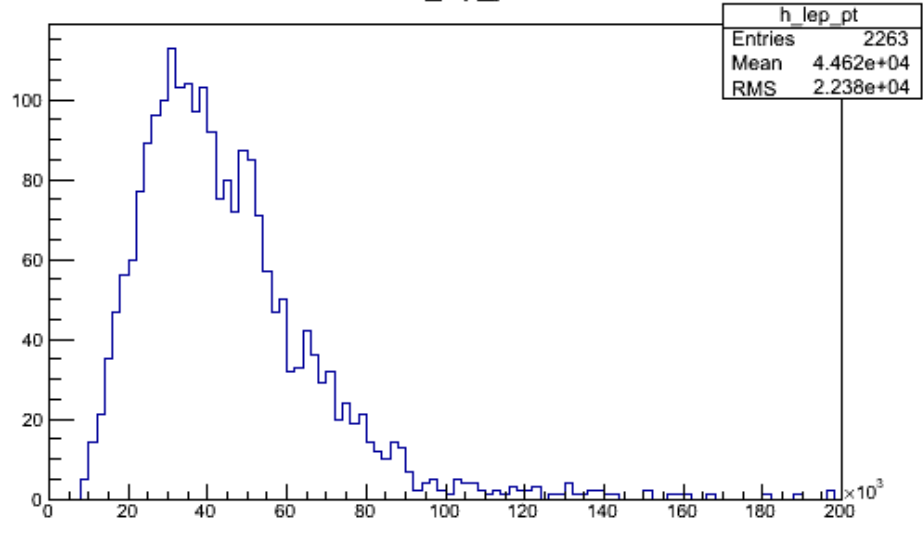
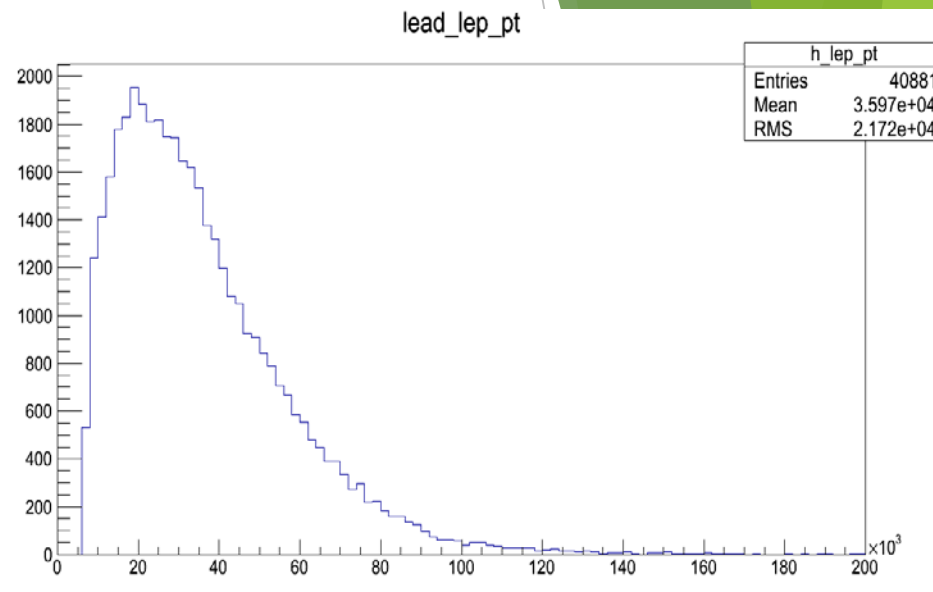
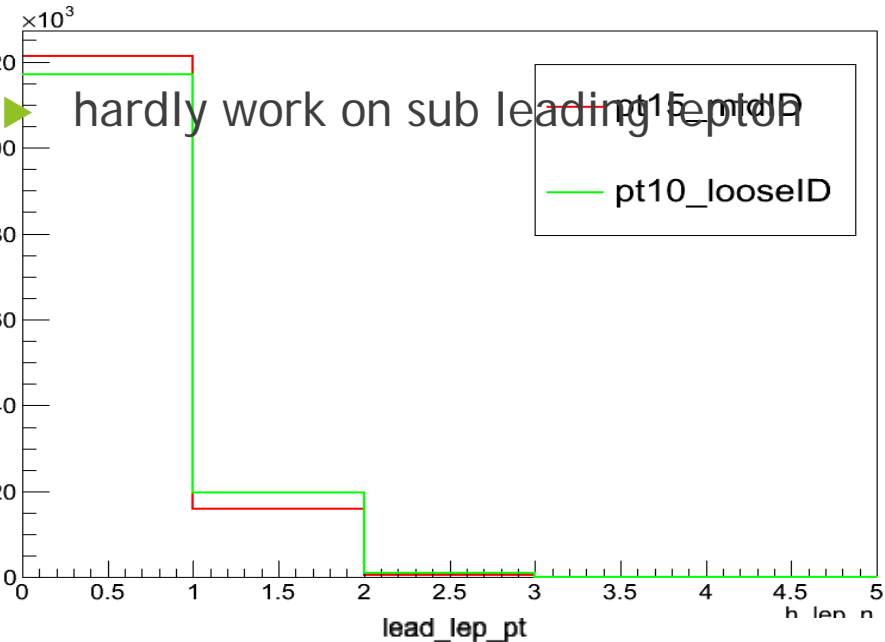
CUT	Value	HWW value
Pt	15GeV	Same
Eta	2.47 X1.37-1.52	Same
ID	mid	tight
Isolation	Ptcone20/Pt < 0.15 Or Ptcone40/Pt < 0.2	PtCone30/ p_T < 0.12 for 15-25 GeV PtCone30/ p_T < 0.16 for > 25 GeV
Overlap with photon	$\Delta R < 0.4$ remove electron	

Electron selection(25142 in total)

CUT	Flag all1745	2lep+MET	After all	Electron number in total
Pt15 midID	84475	1544	1515	16909
Pt10 midID	84475	1784	1745	19211
Pt10 LooseID	84475	1987	1930	21589
Pt7 el & muon MidID	84475	2263	1971	
Pt7 el & muon MidID loose ISO (Only for test)	84475	2603	2508	

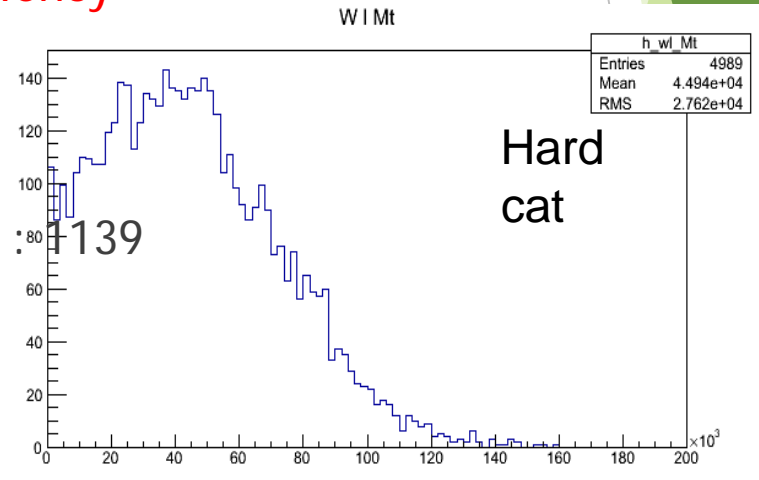
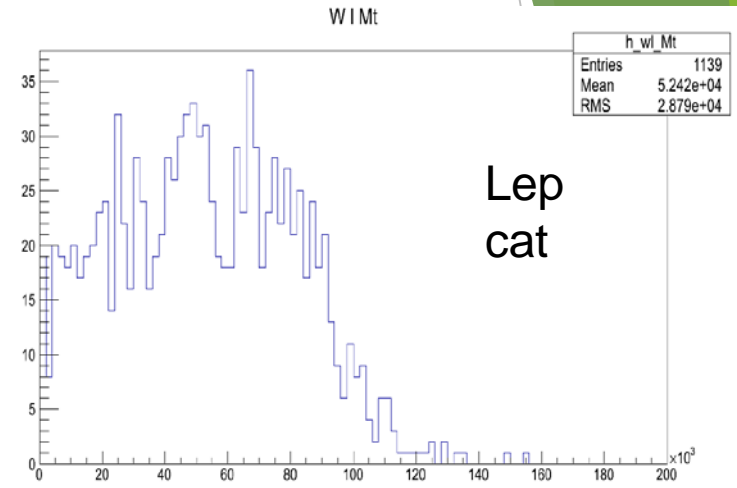
► can save more leptons by loose these cuts

► hardly work on sub leading lepton



Numbers in yylvj

- ▶ number of event: 107756
 - ▶ number of flag_all: 37966 35.2%
 - ▶ number of 1lep 2jet no b : 8916 **8.3% efficiency**
 - ▶ number of events in hard cat : 4589
 - ▶ number of events in lep cat : 2740
 - ▶ number of leptonic cat (only $M_{jj} < 60\text{GeV}$) : 1139
- Maybe some cuts on W_{Mt}

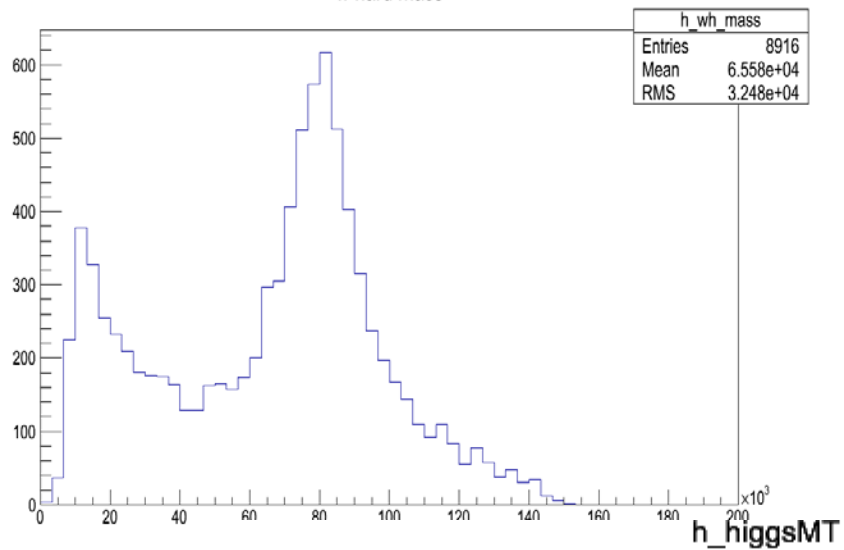


Assume $\sigma(\text{gg} \rightarrow \text{H} \rightarrow \text{hh}) = 1\text{pb}$

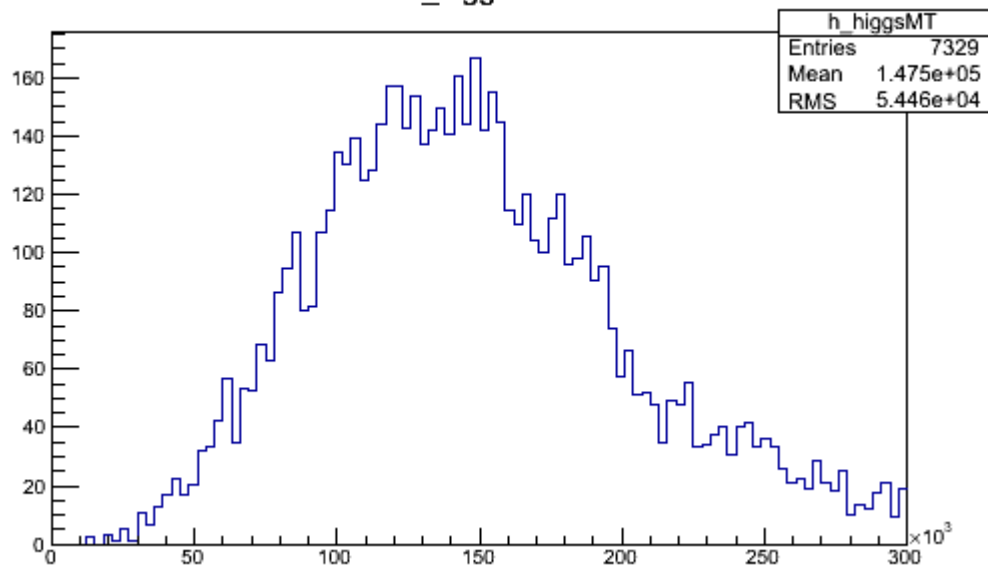
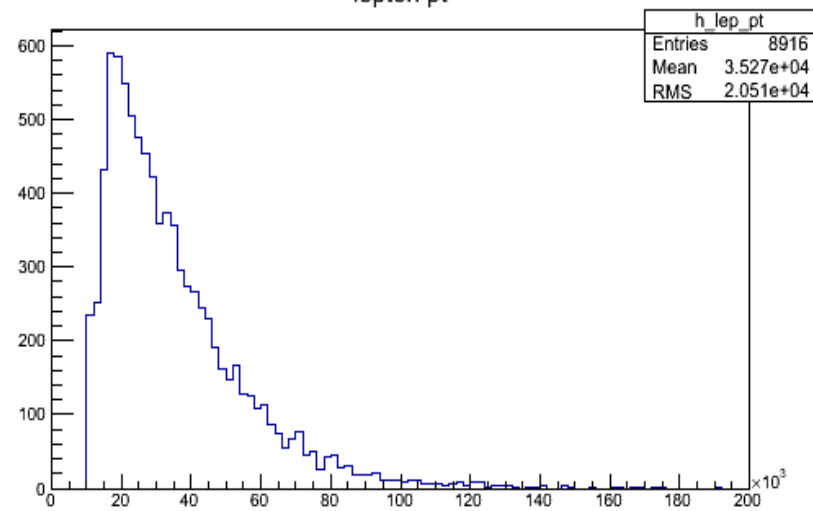
$$\sigma \times 20000 \text{ pb}^{-1} \times \text{br}(\text{h} \rightarrow \text{WW}) \times \text{br}(\text{h} \rightarrow \text{yy}) \times 2 \times \text{br}(\text{W} \rightarrow \text{lv}) \times \text{br}(\text{W} \rightarrow \text{jj}) \times 2 \times 8.3\%$$

= 0.55 events

w hard mass



lepton pt



Cut on WH

- ▶ number of event:
- ▶ number of flag_all: 190002 35.2%
- ▶ number of 1lep 2jet no b: 2998 **0.5% efficiency**
- ▶ number of events in hard cat : 891
- ▶ number of events in lep cat : 1431

$$20 * \text{xs}(\text{pp} \rightarrow \text{wh}) * \text{Br}(\text{h} \rightarrow \text{yy}) * \text{Br}(\text{w} \rightarrow \text{lv}) * \text{eff} = 0.7 * 20000 * 0.029 * 0.3 * 0.005 = 7$$

Cut on ttH

- ▶ number of event:
- ▶ number of flag_all: 51262 35.2%
- ▶ number of 1lep 2jet no b: 9152 **5% efficiency**
- ▶ number of events in hard cat : 6287
- ▶ number of events in lep cat : 1558

$$20 * \sigma_{\text{ttH}} * \text{Br}(h \rightarrow \gamma\gamma) * \text{Br}(w \rightarrow l\nu) * \text{Br}(w \rightarrow \text{else}) * 2 * \text{eff} = \\ 0.1293 * 20000 * 0.029 * 0.3 * 0.7 * 2 * 0.05 = 1.5$$

Cut on Mass Sideband Sample

- ▶ number of event: 23319442
- ▶ number of flag_all: 75298 35.2%
- ▶ number of 1lep 2jet no b: 25

Backups

- ▶ Electron PT

overlap : rm el el_ph -> more el -> no affect on ph

mu the same

jet rm jet el_jet more el-> less jet

- ▶ Assume $\sigma(\text{gg} \rightarrow \text{H} \rightarrow \text{hh}) = 1 \text{ pb}$
- ▶ $\sigma \times 20000 \text{ pb}^{-1} \times \text{br}(\text{h} \rightarrow \text{WW}) \times \text{br}(\text{h} \rightarrow \text{yy}) \times 2 \times \text{br}(\text{W} \rightarrow \text{lv})^2 = 0.86$

muons

Cut	value
pt	10
eta	2.47
iso	Same to electron
vertex	$\text{fabs}(D0) < 1, \text{fabs}(Z0) < 10$
ld	loose