CHARGED HIGGS SEARCH IN WH

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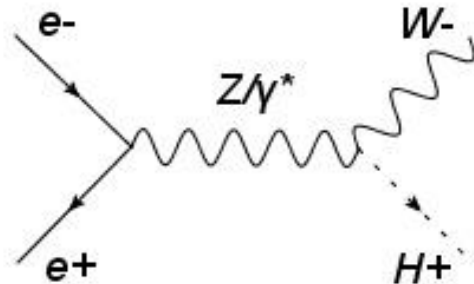
tohoku univ.

14/3/2014

Background analysis

Signal : WH→hhlv (→jj(j)v)
- Ecm = 250 GeV
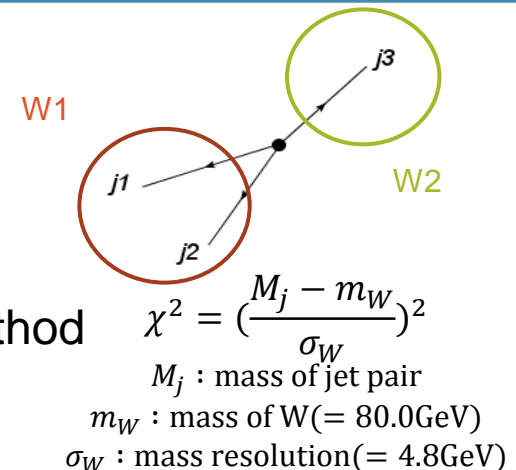- m_{H+-} = 150GeV
- P(e+, e-) = (+30%, -80%)

BG : single Z → hadronic
single W →semileptonic
Zee →semileptonic
ZZ →semileptonic
ZZ → hadronic
WW →semileptonic
WW → hadronic
ZZorWW → hadronic
ffh

● forced 3-jet analysis using Durham algorithm
 - W boson is reconstructed by pairing di-jet
   which gives the smallest χ^2

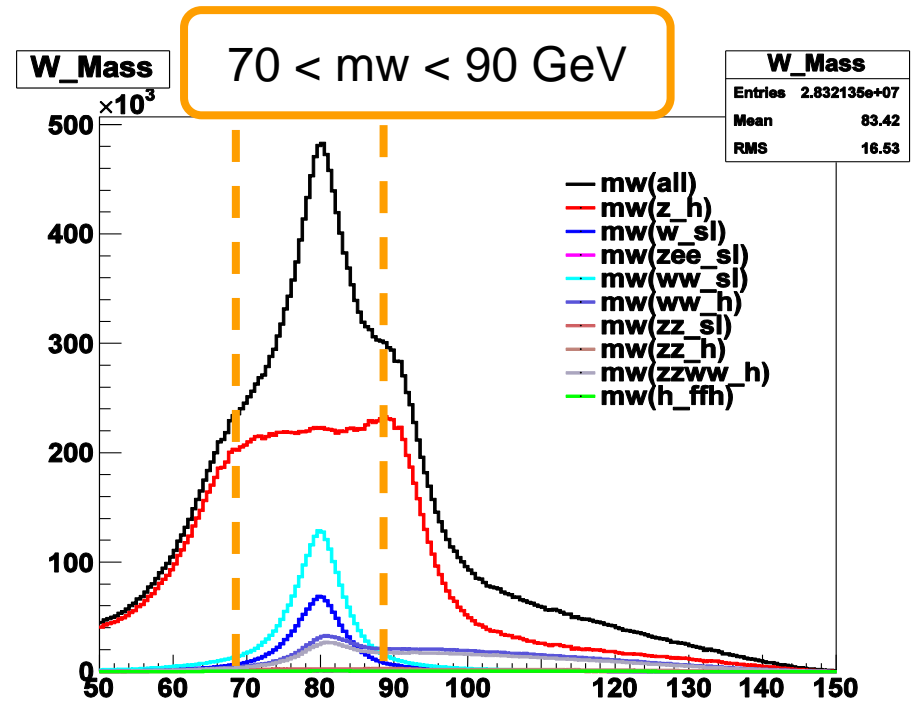● H mass (or W mass) is calculated by recoil mass method

$$\chi^2 = (\frac{M_j - m_W}{\sigma_W})^2$$

M_j : mass of jet pair
m_W : mass of W(= 80.0GeV)
σ_W : mass resolution(= 4.8GeV)

mw cut

※ only BGs
- Ecm = 250 GeV
- luminosity = 250 fb^{-1}
- P(e+, e-) = (+30%, -80%)

evt sample	no	mw
Z_h	19511616	8757843
W_sl	1474541	1232081
Zee_sl	94568	26322
WW_sl	2748229	2297814
WW_h	2176556	805655
ZZ_sl	214231	104568
ZZ_h	210343	45777
ZZWW_h	1813024	663714
ffh	78232	24720

70 < mw < 90 GeV

W_Mass	
Entries	2.832135e+07
Mean	83.42
RMS	16.53

- mw(all)
- mw(z_h)
- mw(w_sl)
- mw(zee_sl)
- mw(ww_sl)
- mw(ww_h)
- mw(zz_sl)
- mw(zz_h)
- mw(zzww_h)
- mw(h_ffh)

☺could decreace Z-events
☹many Z_h events remained
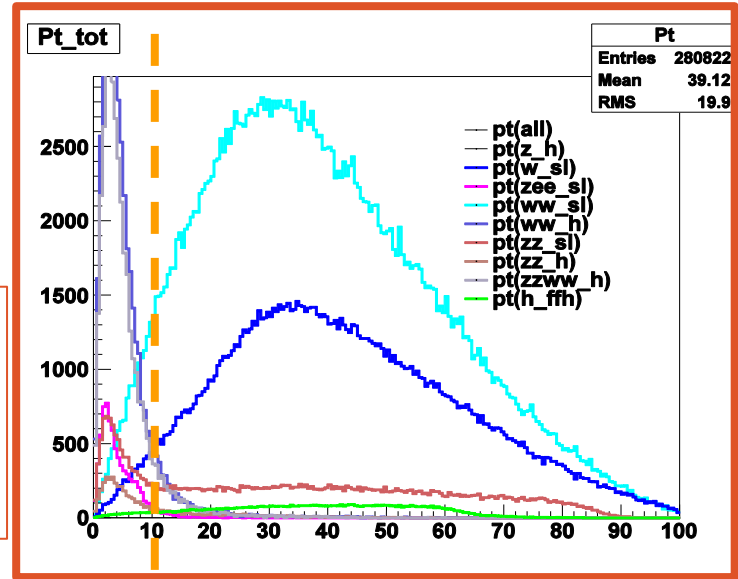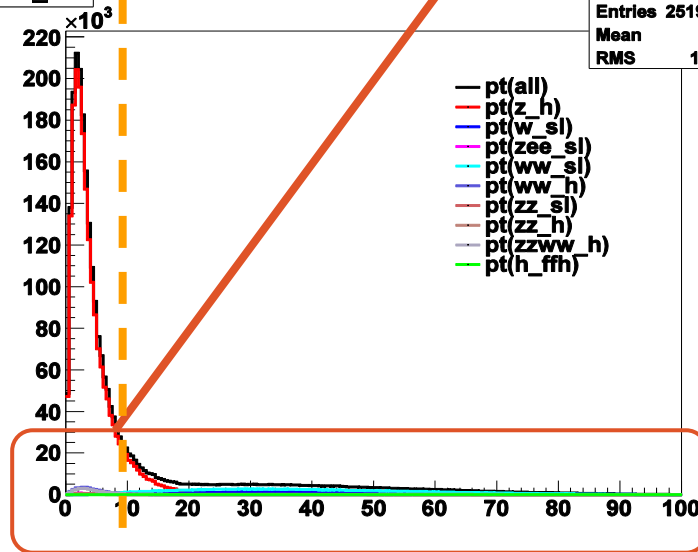☹W-events couldn't cut

Other parameters cut

I checked…
- w production angle
- helicity angle
- y23
- y34
- 3rd jet's …
    - mass
    - tracks
    - PFOs
- pthrust
- b_tags of each jet
- Evis
- miner thrust
- major thrust
- mass miss
- total Pt

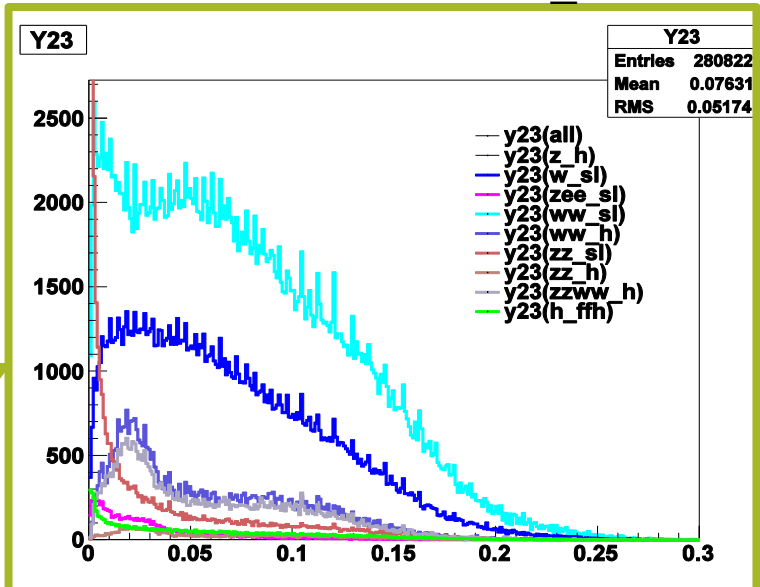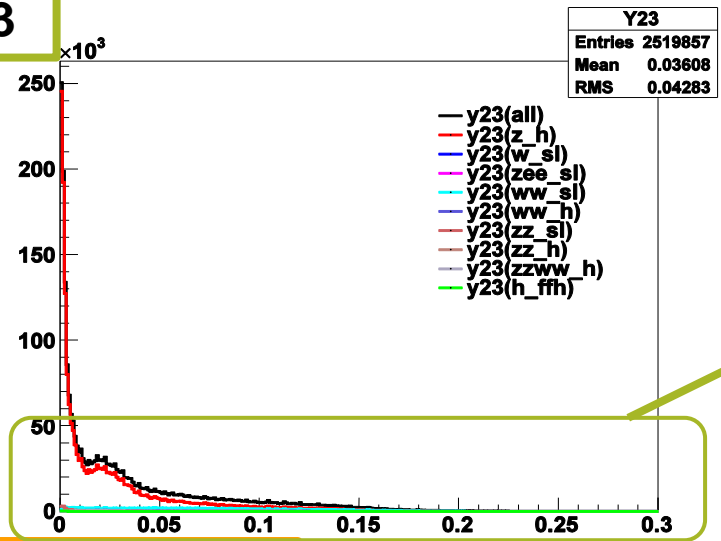it can drecreace the events that don't include W_sl and WW_sl.

total Pt

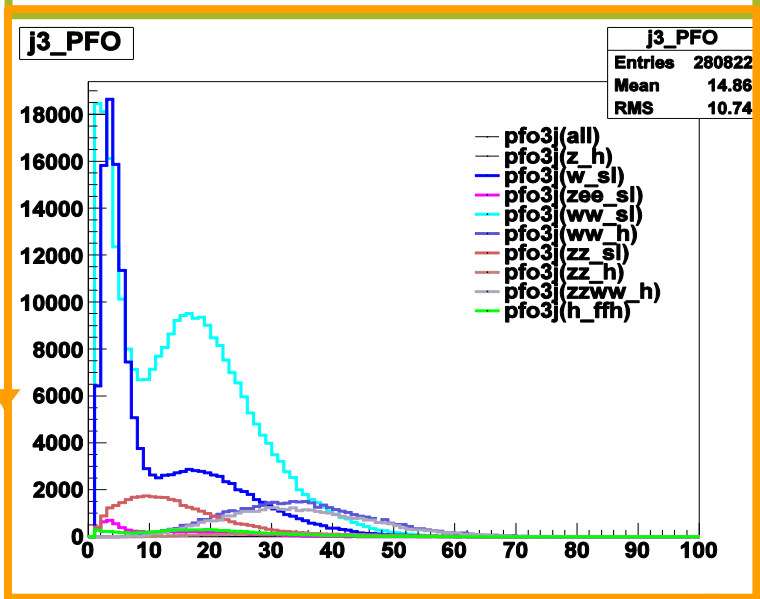※I'm sorry but I don't check "how many events will be cut"….
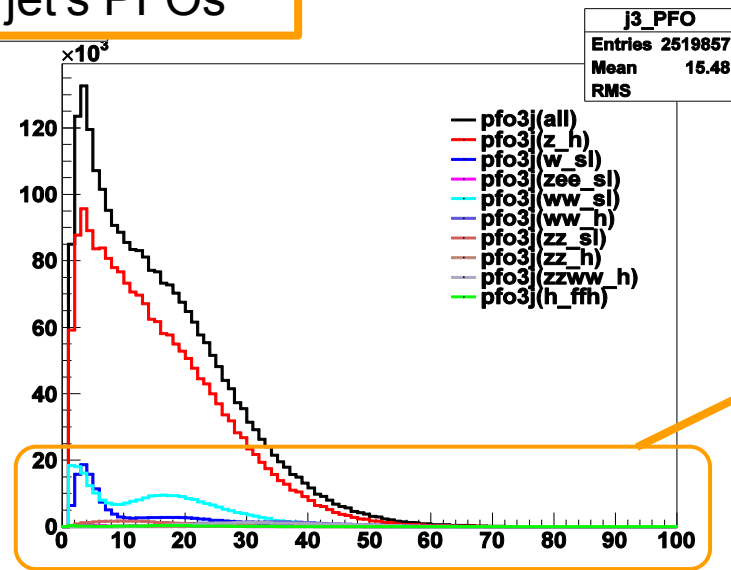
Other parameters cut

can decrease the W_sl and WW_sl events(?).

y23

3rd jet's PFOs
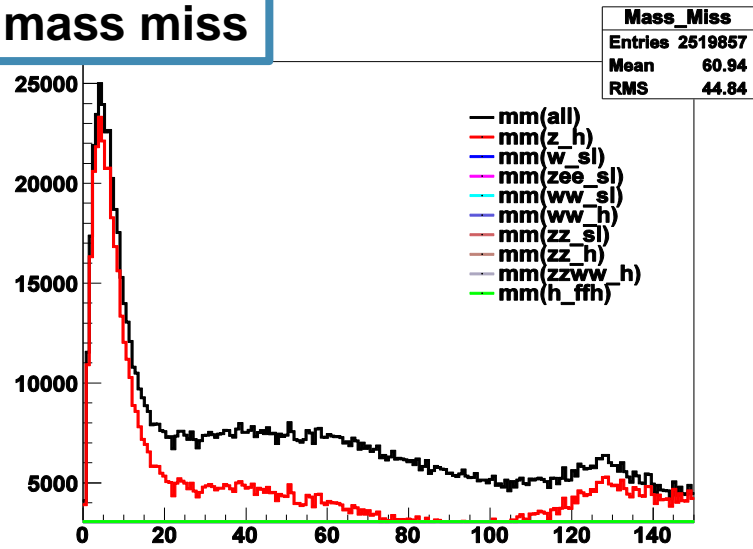
mass miss

Mass_Miss	
Entries	2519857
Mean	60.94
RMS	44.84

mm(all)
mm(z_h)
mm(w_sl)
mm(zee_sl)
mm(ww_sl)
mm(ww_h)
mm(zz_sl)
mm(zz_h)
mm(zzww_h)
mm(h_ffh)

there is not include WH event , so ….

schedule

- **checking how many events will be cut by settig the renge of parameters**

- **after complete preparation of WH samples**

- **preparing for JPS (my talk is 27th!)**