updates on tth study

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updates

- re-optimize cut thresholds of b tag values

  1~5 % improvements for each signal category
- add very loose 4 b tagged category to 8, 6, 4 jets channels

  ~ 3% improvements for each category
- remove Mjjj (top mass>140GeV) cut.
- remove missing momentum (MP>20) cut except a category of lv+6j loose

  ~ 1 % improvements

~ 9 % improvement in total by loose b category and small changes of event selection.

changes of b tag values

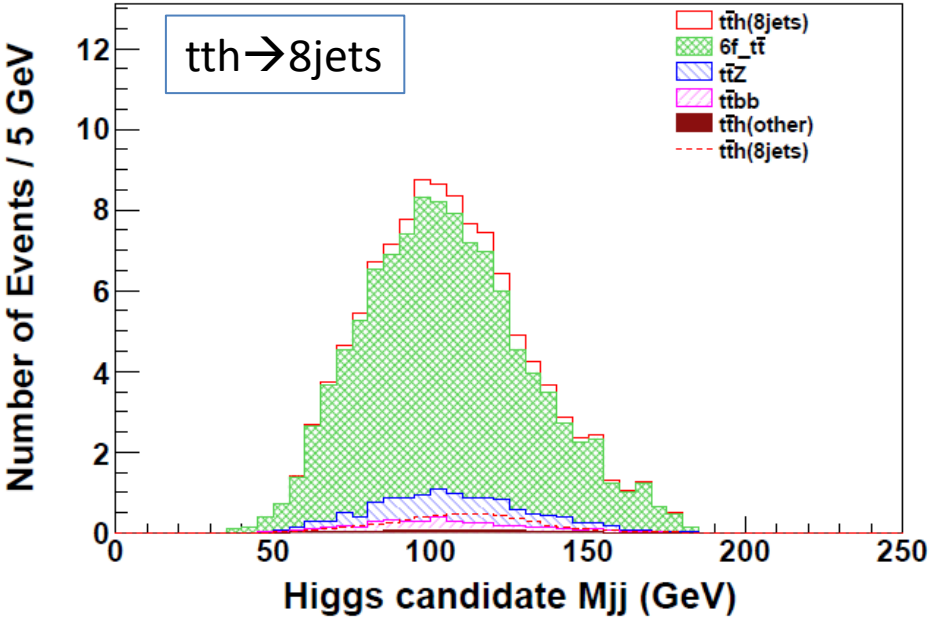
process	previous (all)	8jets	lv+6jets	2l2v+4jets
b 1 (highest)	0.85	0.94	0.91	0.87
b 2 (second)	0.8	0.82	0.82	0.80
b 3	0.6	0.73	0.54	0.47
b 4	0.2	0.155	0.15	0.10

loose b tag category

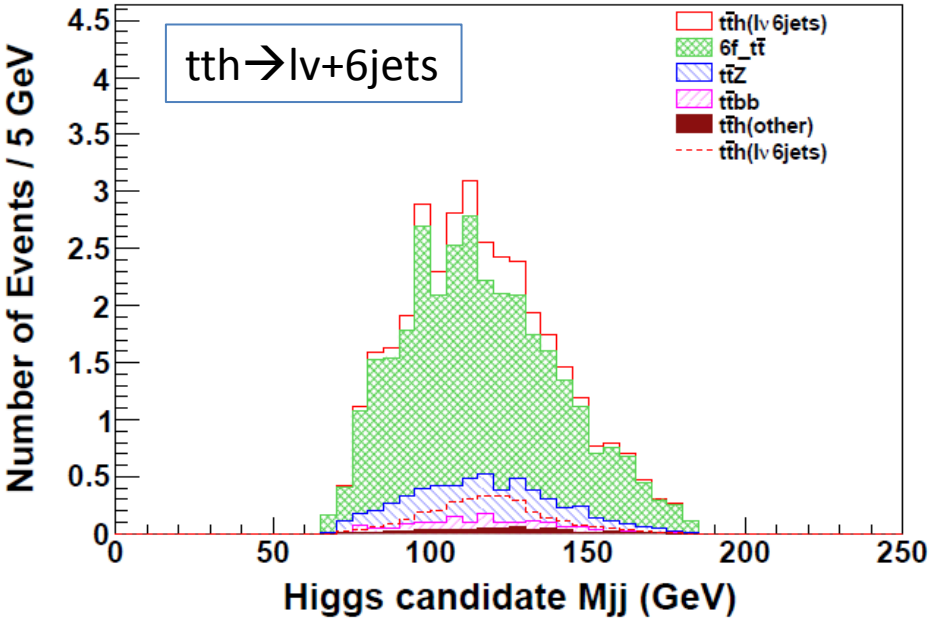
- events do not categorized in nominal b tagged category
- apply loose b tag selection
- analysis procedure is same as nominal b tagged category

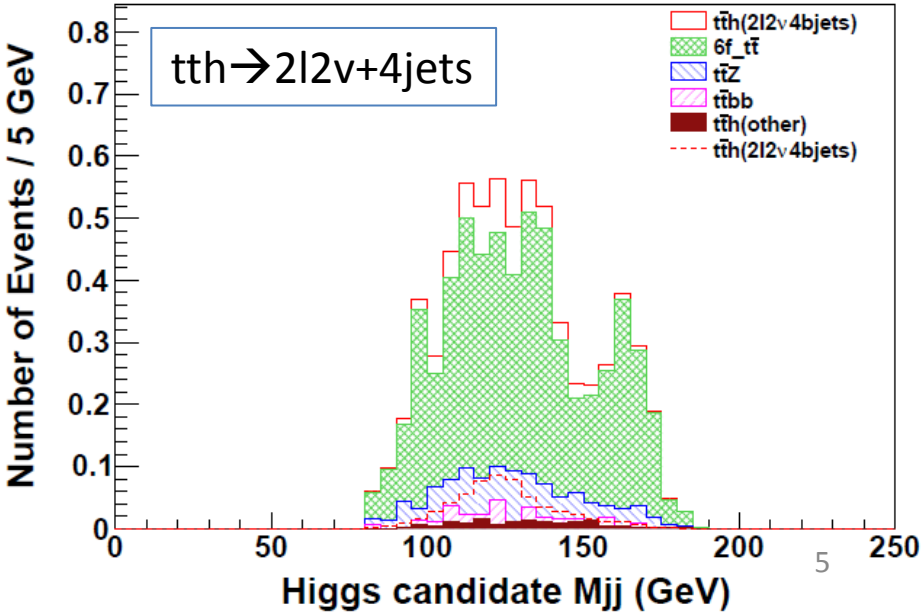
process	8jets	lv+6jets	2l2v+4jets
b 1 (highest)	0.75	0.80	0.60
b 2 (second)	0.69	0.56	0.43
b 3	0.36	0.28	0.21
b 4	0.06	0.05	0.039

Mjj shapes of loose b category



- 500 fb-1, $(Pe^-, Pe^+) = (-0.8, +0.3)$
- cut procedure is same as nominal b tagged category.
  - cut threshold of parameters are changed
- 6f events are dominant background





combined result of $S/\sqrt{S+B}$ (w/o systematic uncertainties)

LCWS 2015

H20

Integrated Lumi. (fb^{-1})	(-0.8,+0.3)	(+0.8,-0.3)	combined (-0.8,+0.3)&(+0.8,-0.3)
500	3.05	2.07	3.68
200	1.92	1.30	2.32
1400	5.11	3.46	6.18
200&1400	5.46	3.69	6.61

all combined result of H20 scenario

$S/\sqrt{S+B}$ = 6.61, $|\Delta g_t/g_t|$ = 7.85%

Current result

500 GeV, 500 fb^{-1}, $(Pe^-,Pe^+)=(-0.8,+0.3)$

$S/\sqrt{S+B}$ = 3.05 (LCWS) → 3.32 (now)

all combined result of H20 scenario (simply extrapolate the current result)

$S/\sqrt{S+B}$ = 7.19 (6.61(LCWS)), $|\Delta g_t/g_t|$ = 7.22% (7.85%(LCWS))