

# **SKKU-HEP-CMS Weekly Meeting**

**At 22.Dec.2014  
by DongHyun Kim**

# STATUS

## Data analysis

### ❖ **t tbar + b bbar cross section**

- **arXiv : 1411.5621v1 - Measurement of the cross section ratio  $\sigma_{ttbb}/\sigma_{ttjj}$  in pp collisions at  $\sqrt{s} = 8$  TeV**
- **arXiv : 1302.0508v2 - Measurement of the tt production cross section in the all-jet final state in pp collisions at  $\sqrt{s} = 7$  TeV**
- **LHCP\_mangano : Measurements at 8 TeV of ttbar events with additional particles in the final state**



# tt+bb@ 8TeV (19.6 /fb)



Final state	ee	μμ	eμ	All
$t\bar{t} + b\bar{b}$	$18.1 \pm 0.8$	$26.8 \pm 1.0$	$60.9 \pm 1.5$	105
$t\bar{t} + bj$	$34.3 \pm 1.1$	$51.4 \pm 1.4$	111	196
$t\bar{t} + c\bar{c}$	$13.4 \pm 0.9$	$20.5 \pm 1.0$	$47.0 \pm 1.6$	$80.9 \pm 2.4$
$t\bar{t} + LF$	244	359	822	1,425
$t\bar{t}$ others	$20.5 \pm 1.1$	$25.6 \pm 1.1$	$63.7 \pm 1.9$	109
multijet	< 0.1	$1.4 \pm 1.2$	$1.4 \pm 1.2$	$2.9 \pm 2.2$
W + jets	< 0.1	< 0.1	< 0.1	< 0.1
VV	< 0.1	$0.3 \pm 0.1$	< 0.1	$0.4 \pm 0.7$
Single top-tW	$7.9 \pm 2.0$	$11.6 \pm 2.5$	$25.1 \pm 3.7$	$44.7 \pm 4.1$
$Z/\gamma^* \rightarrow ll$	$5.6 \pm 4.3$	$5.7 \pm 3.9$	$2.9 \pm 3.2$	$14.4 \pm 5.7$
Total expected	351	512	1,159	2,023
Data	367	506	1,145	2,018

Factor 0.38 to account for difference in selection efficiency between ttbb and ttjj (from simulation)



Cross-section ratio at particle level:

$$\sigma(t\bar{t}b\bar{b}) / \sigma(t\bar{t}jj) = 0.023 \pm 0.003(\text{stat.}) \pm 0.005(\text{syst.})$$

Process	Jet $p_T > 20$ GeV/c
$\sigma(t\bar{t}b\bar{b})$ [fb]	$460 \pm 45$ (stat.) $\pm 120$ (syst.)
$\sigma(t\bar{t}jj)$ [pb]	$19.2 \pm 0.5$ (stat.) $\pm 1.9$ (syst.)



using again selection efficiencies from simulation

# Plan

- 2014 File back up
- Office 정리
- 12월 29일 ~ 1월 08일 한국 방문 예정