

# Jet clustering & flavor tagging

末原大幹 (東大ICEPP)

# $e^+e^- \rightarrow ZHH$ ( $Z \rightarrow qq, m_H = 120 \text{ GeV}$ )

Y. Takubo, ALCPG09

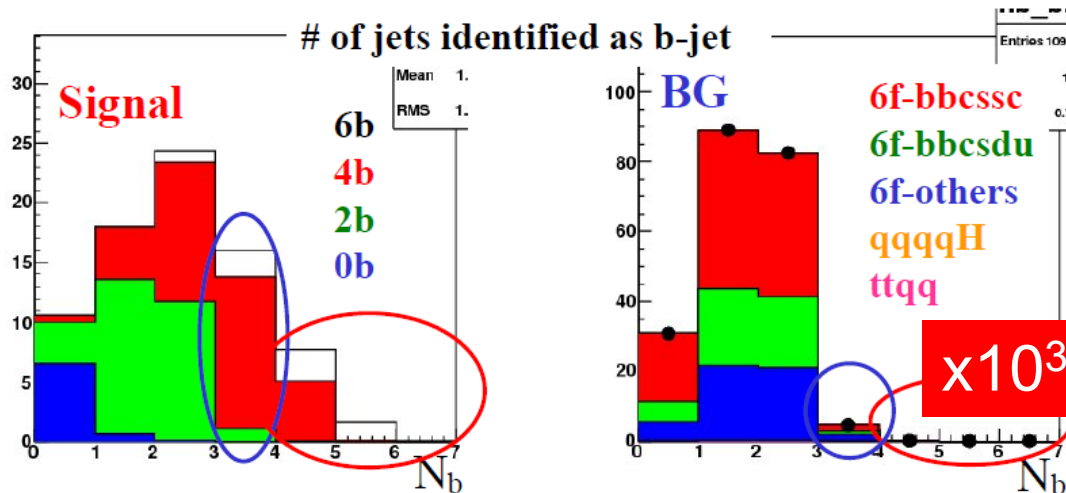
## Selection of event samples

BG can be rejected effectively by using events with  $N_b \geq 3$ .

	No cut	$N_b = 3$	$N_b \geq 4$
Signal	79	15.9(0.20)	9.5(0.12)
BG	207,144	4663(0.02)	147( $7 \times 10^{-4}$ )

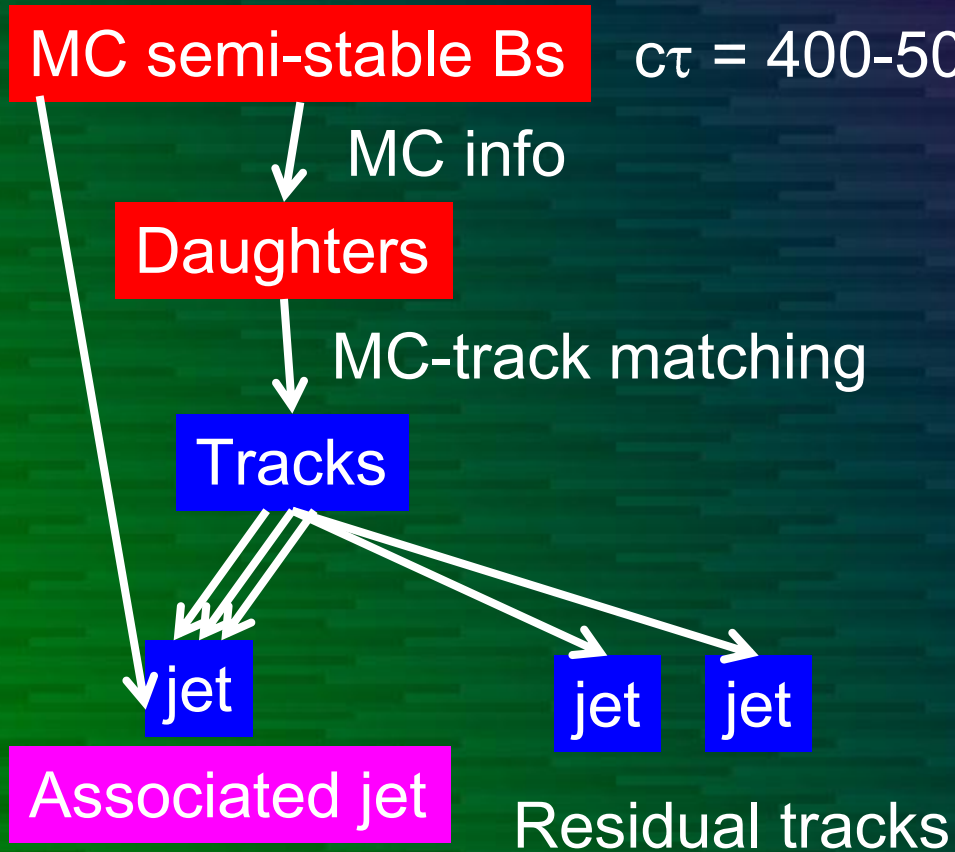
$\sigma = 0.16 \text{ fb}$

Events with  $N_b = 3$  and  $N_b \geq 4$  were selected as analysis samples.



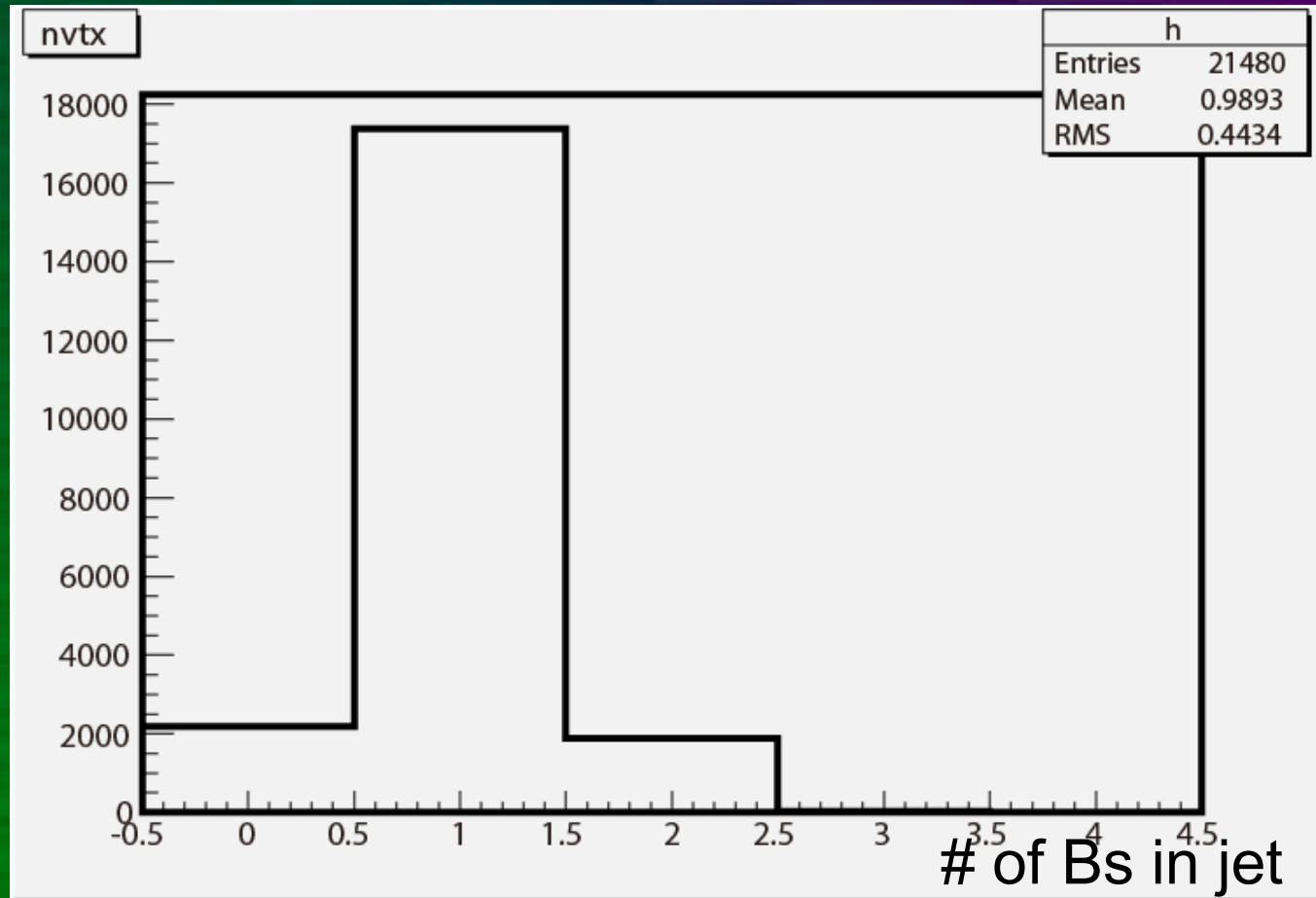
Degradation of b-tagging due to imperfect jet clustering??

# Analysis flow



# Number of Bs in each jet

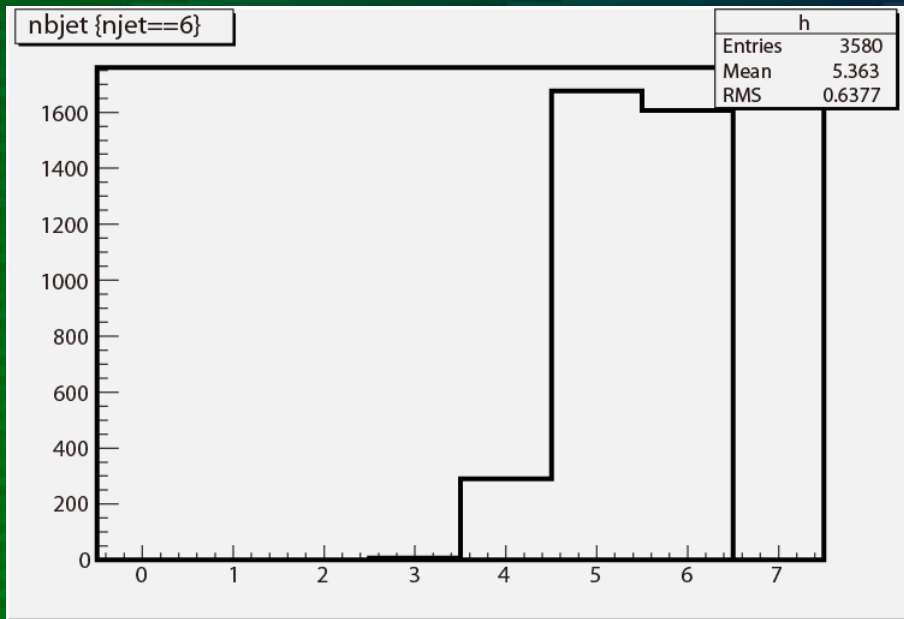
ZHH -> bbbbbb (each jet should contain one B)



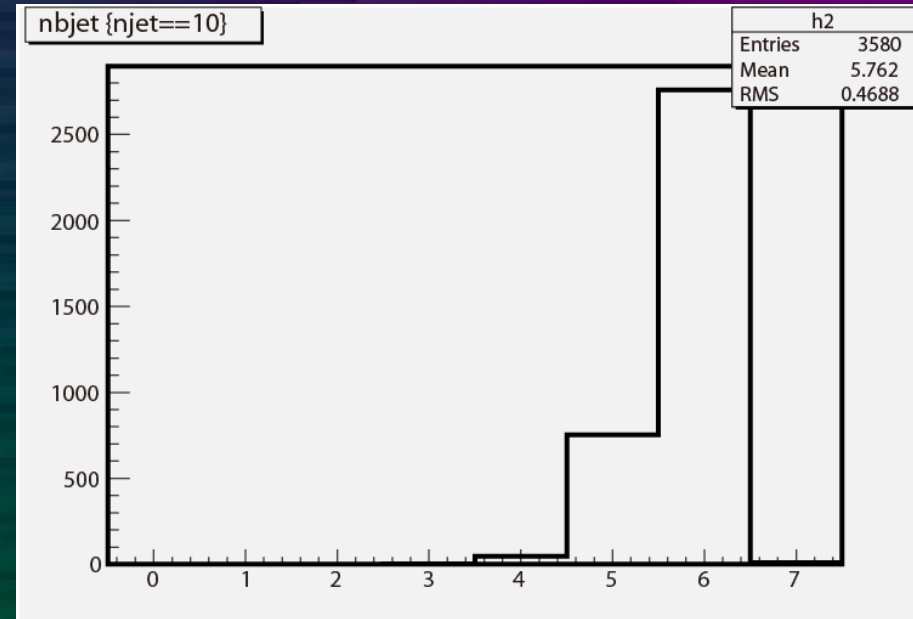
10% of jets don't have any Bs...

# 6 jet vs. 10 jet

# of jets containing B vertex (MC level)



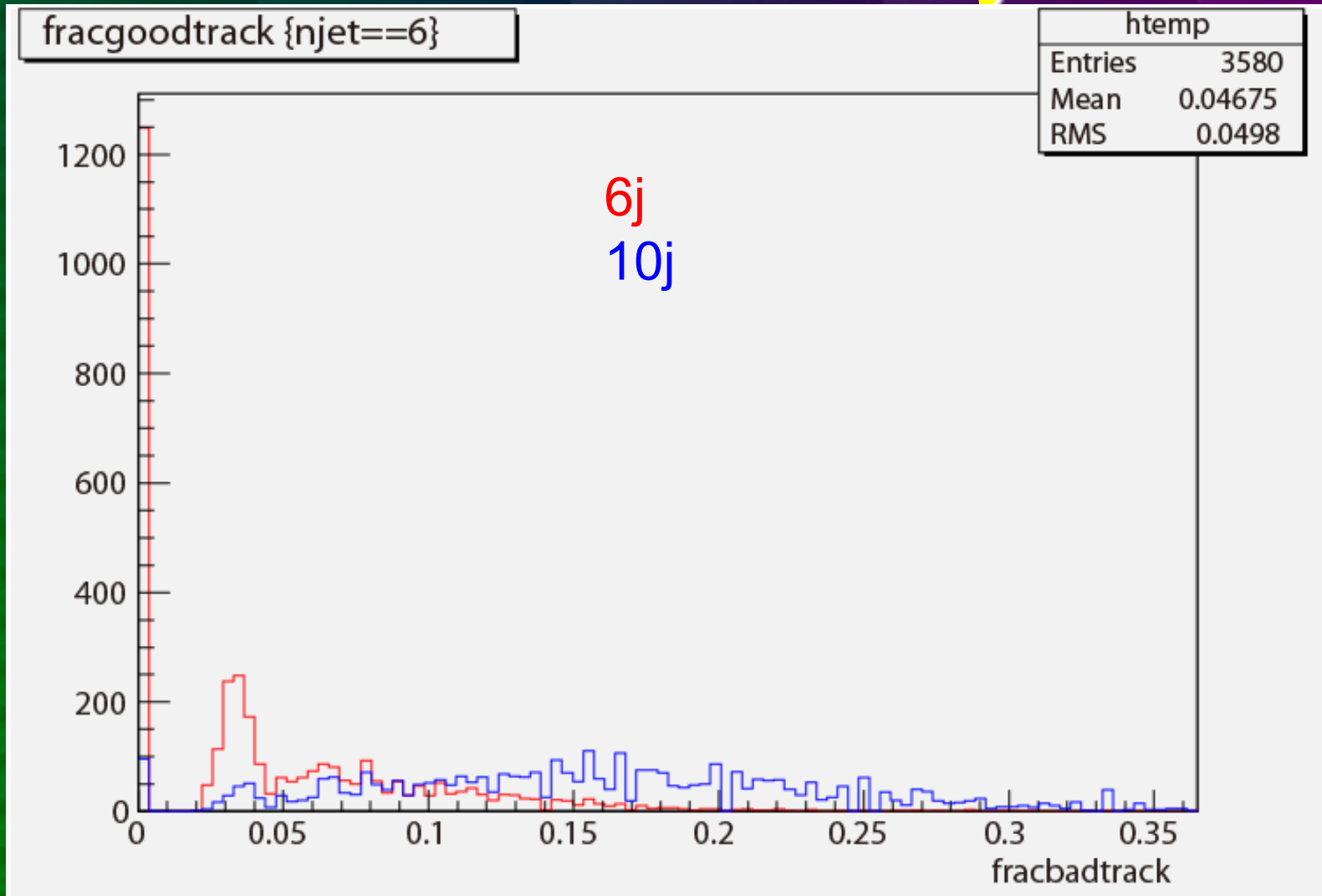
6-jet clustering



10-jet clustering

10 jet clustering must be better...

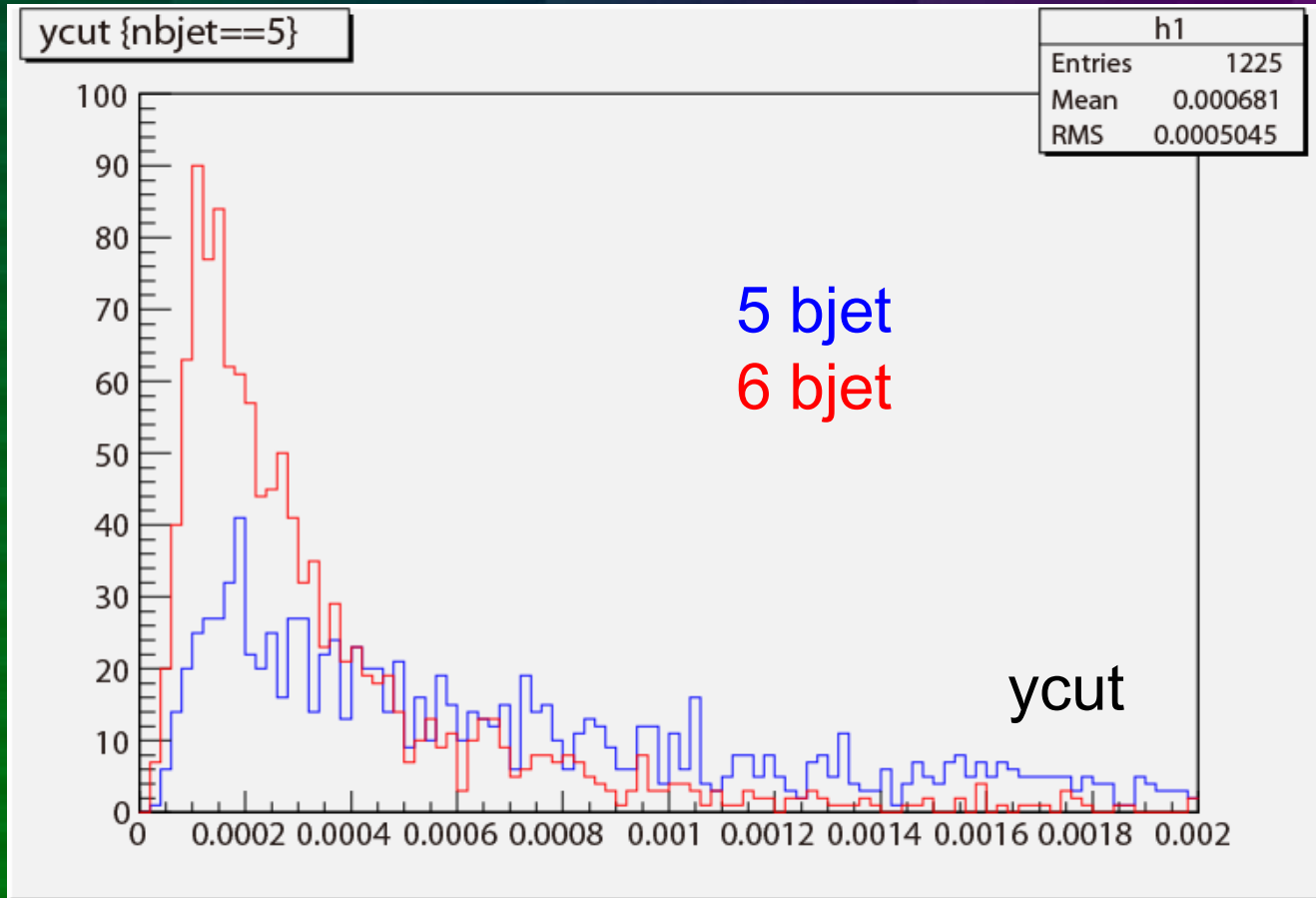
# # of missed secondary tracks



Missed secondary tracks are increased in 10 jets...

# Ycut optimization

“fixycut” may be better than “fixnjet” ...



Ycut ~ 0.0005 may be optimum?

# To Do

- Check # of reco bs with  $y_{\text{cut}}=0.0005$  in
  - ZHH
  - Ttbar
- Smarter vertex finder which does not depend on the jet clustering too much