

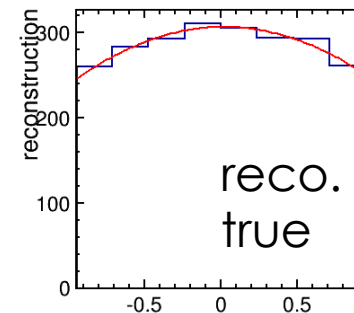
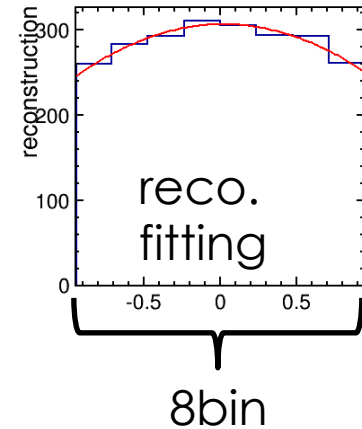
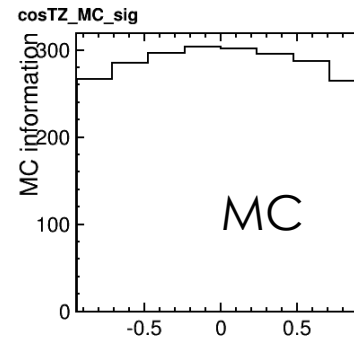
# CP-mixture (Friday Meeting)

2014.10.24

Shun Watanuki @ Tohoku University

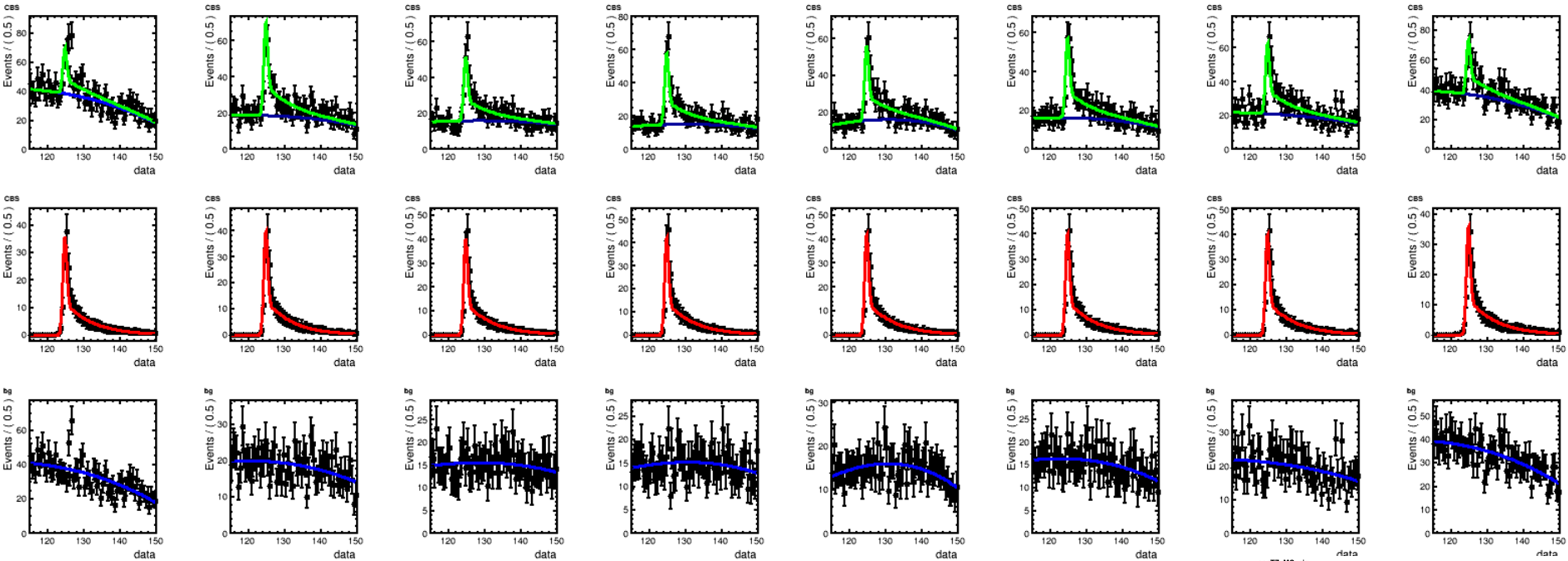
# Procedure of CP-mixture Study

- Look Z production angle of  $\mu\mu h$ .
  - Optimal nbin is now being investigated (4bin and 8bin are tried).
- Estimate  $N_{\text{sig}}$  by recoil mass fitting for each region of  $\cos\theta_{Z \text{ boson}}$ .
- Fit the obtained distribution by parabola, and check asymmetry.

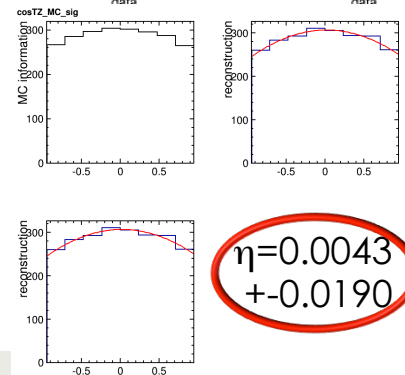


# Current Status

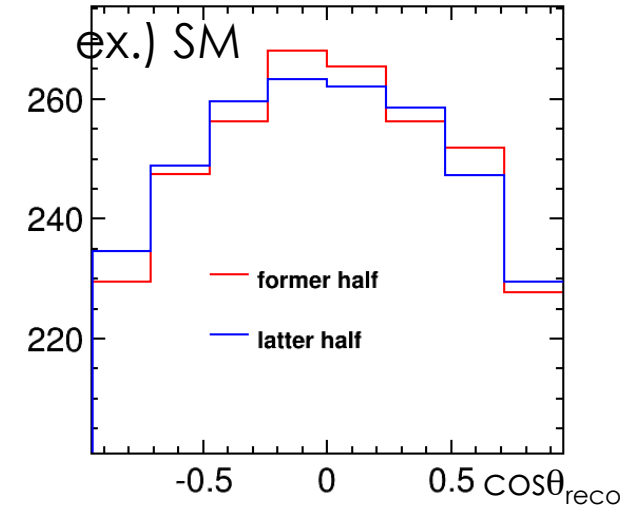
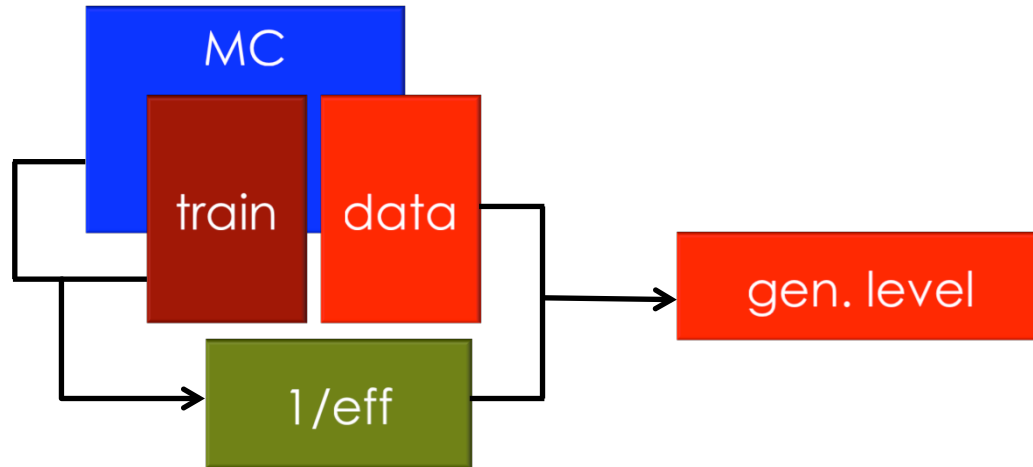
□ I tried to increase number of bins 4  $\rightarrow$  8 to evaluate symmetry (asymmetry) well. (Still  $\eta$  error is too large).



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$N_{\text{sig}}$	260.3	283.1	292.4	311.1	305.7	294.5	292.6	261.3
$N_{\text{sig\_true}}$	261.0	283.3	293.1	309.5	305.4	293.0	292.7	262.3
$N_{\text{BG}}$	2274	1295	1061	1026	1026	1062	1383	2295
$N_{\text{BG\_true}}$	2272	1294	1061	1027	1026	1064	1383	2294



# Choosing Training Sample

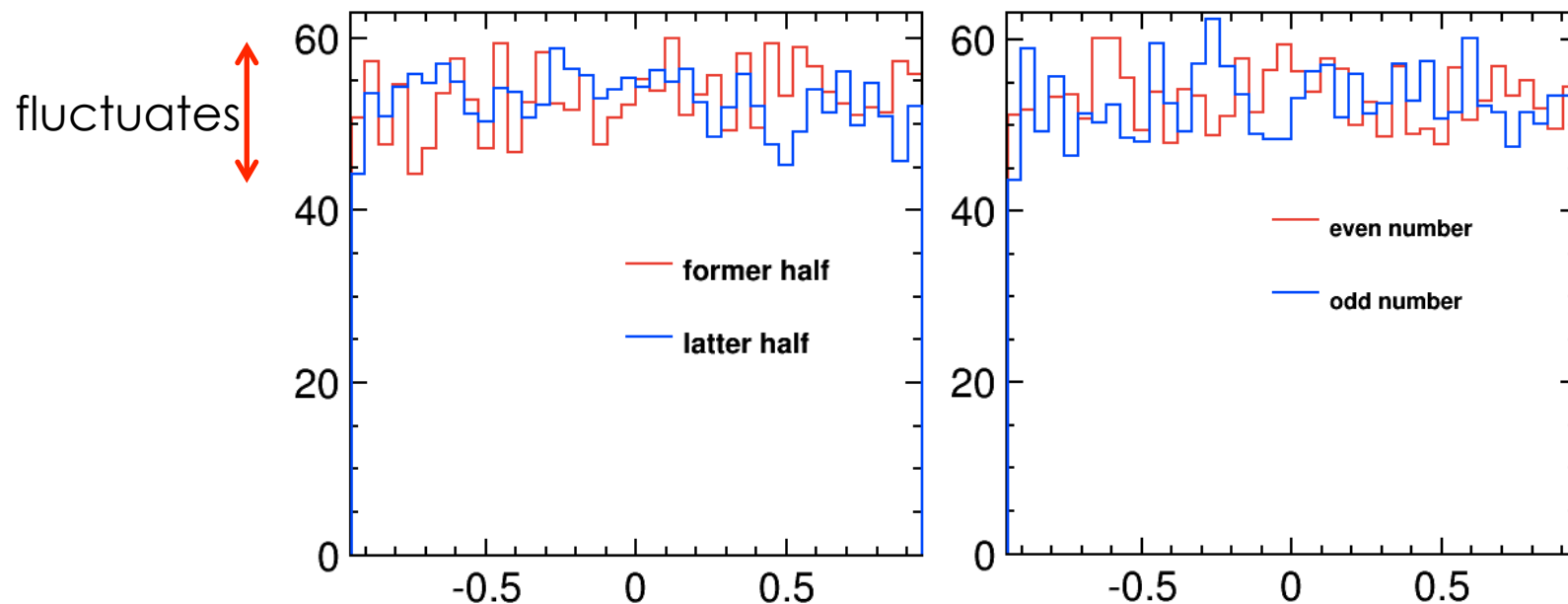


- Final distribution depends on how to choose training sample not negligibly (?).
- If former half events are used as training, efficiency distribution has smaller value in barrel part, so that final distribution scaled to generator level has smaller peak, and this causes worse result.
- A : former half events as training, latter half as data  
B : latter half events as training, former half as data

MC	266.9	285.0	296.9	304.0	301.5	295.7	287.4	264.2
A	272.9	286.6	300.8	298.5	297.7	298.3	282.1	266.2
B	261.0	283.3	293.1	309.5	305.4	293.0	292.7	262.3

# Choosing Training Sample

- Especially for a0b3bT0 sample, fluctuation is too large (maybe because of its flat distribution).
- Left figure shows comparison first half second half, right shows even and odd number event.
- This will cause dependence on choosing training samples for  $\eta$ .



# Next Plan

- Problem of large fluctuation of  $a_0 b_3 b_T$  sample should be understood.
- Optimal method to estimate  $\eta$  error is needed (fit by parabola seems to be OK, but now error is too large).
- I should check relation between “ $\eta$ ” and “ $a, b, b^{\sim}$ ” to estimate  $\eta$  value from existing samples with anomalous coupling.