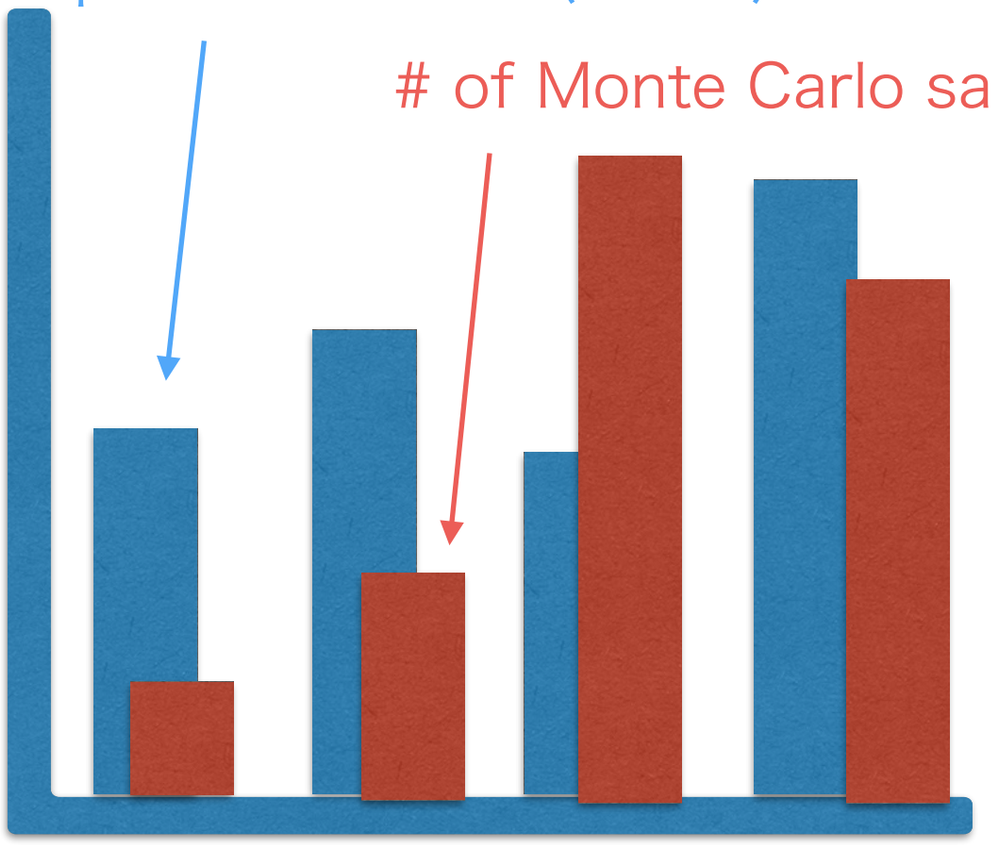
Background study

Propose : Estimate Monte Calro fluctuation

We can't make Monte Calro samples amount of 2ab-1 because some sample is huge. → Define "Weight"



$$\text{Weight} = \frac{\text{Expect \# of event (2ab-1)}}{\text{\# of Monte Carlo sample}}$$

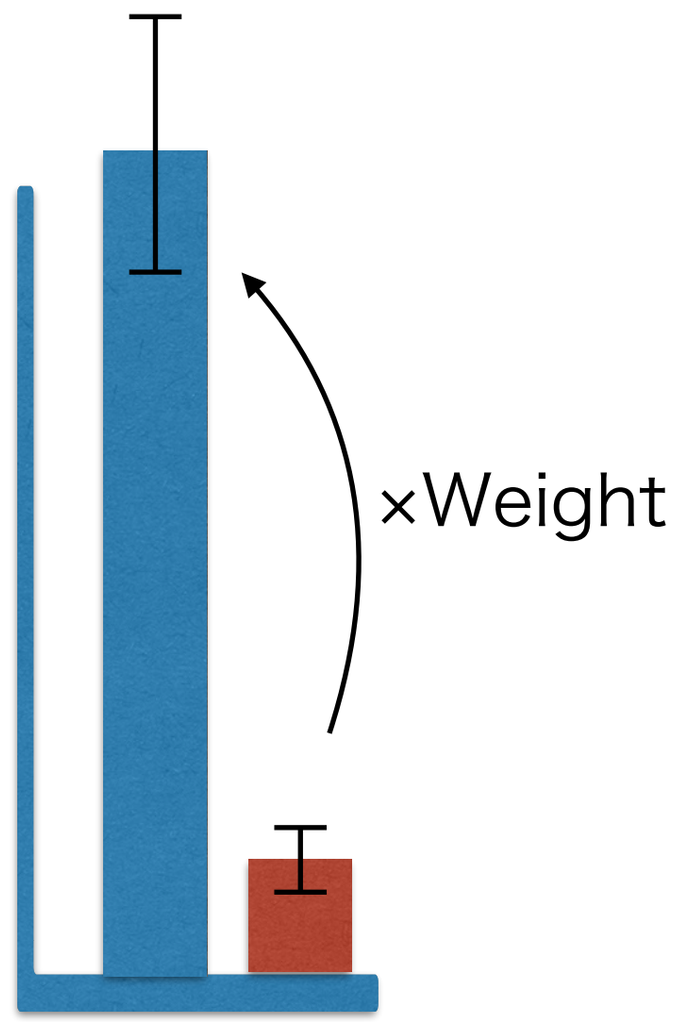
What is the problem?

Propose : Estimate Monte Calro fluctuation

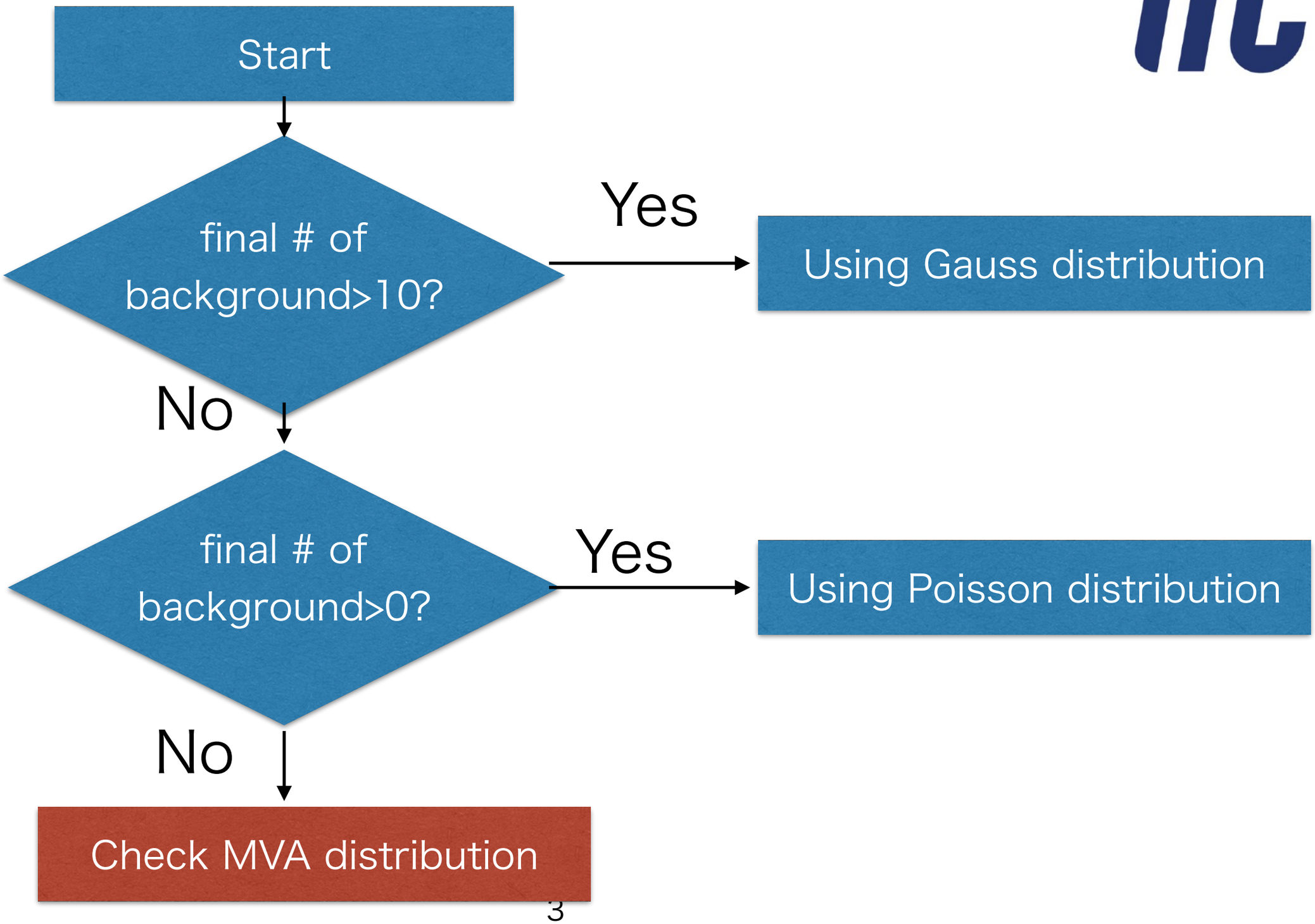
$$\text{Weight} = \frac{\text{Expect \# of event (2ab-1)}}{\text{\# of Monte Carlo sample}}$$

If a sample has huge weight (few Monte Carlo samples), its error seems over estimated.

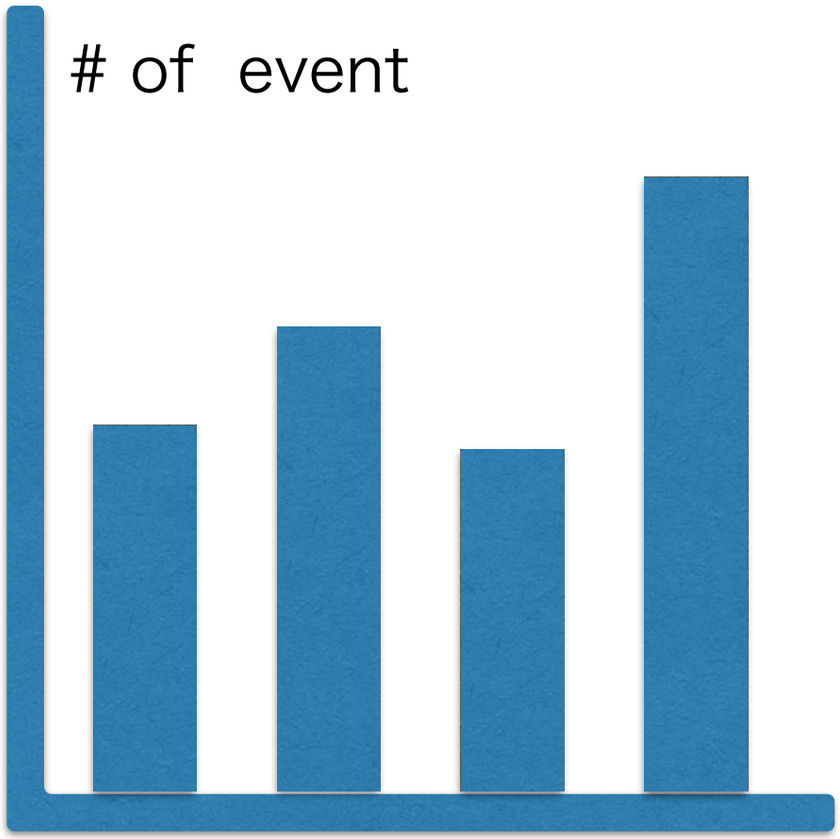
→ When we calculate the number of background at the worst case (upper limit), we should correct this effect.



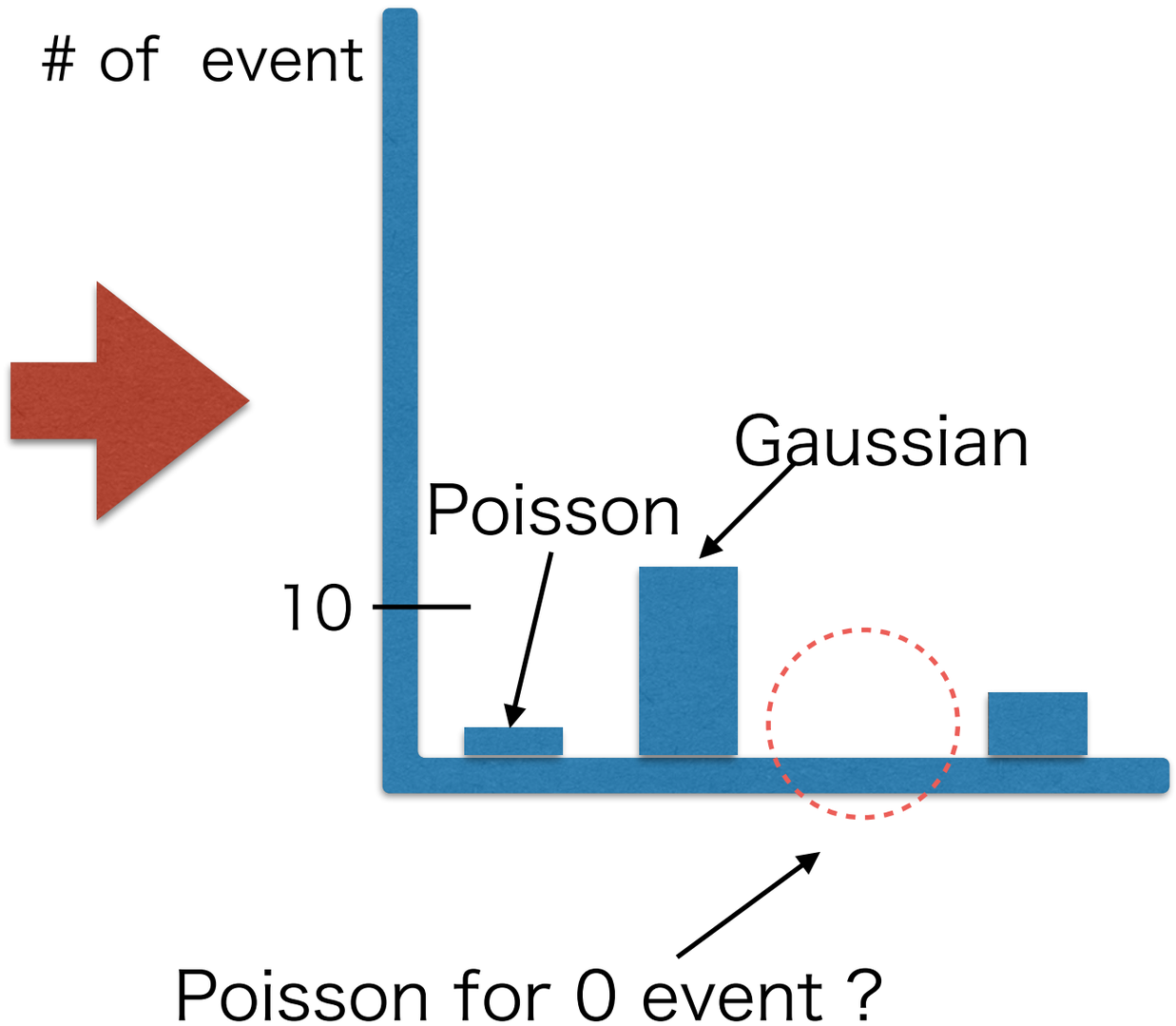
Analysis Flow



Before cut (Just after the precut)



After cut



For 0 background

Most background is suppressed by MVA, so I estimate how MVA suppress backgrounds

Before cut	After MVA cut
2422.2	66.5
95.7	2.7
29.5	0.0

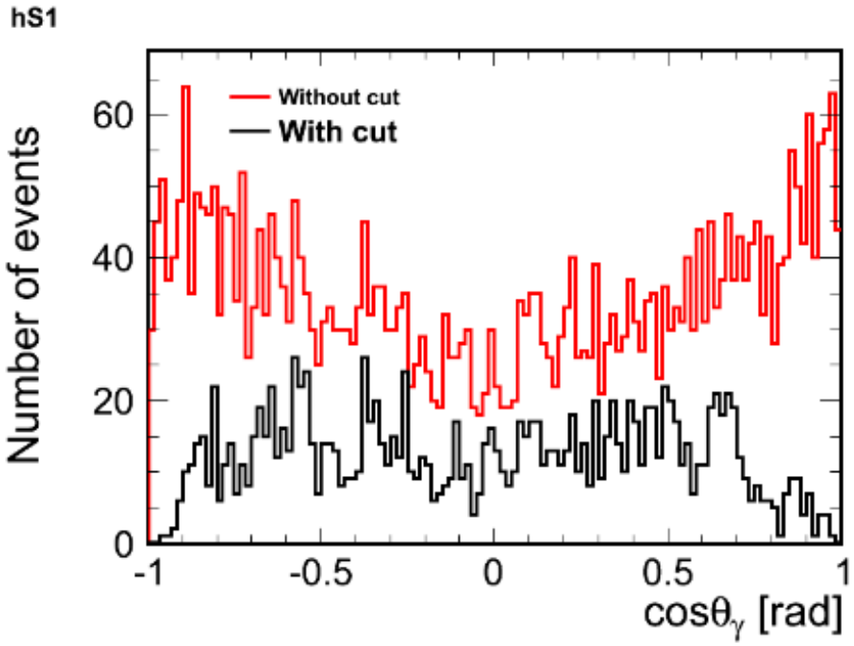
$$\text{MVA suppression ratio} = \frac{\#\text{ of event before cut}}{\#\text{ of event after cut}}$$

※ If the number of event after cut is 0, this ratio is 1

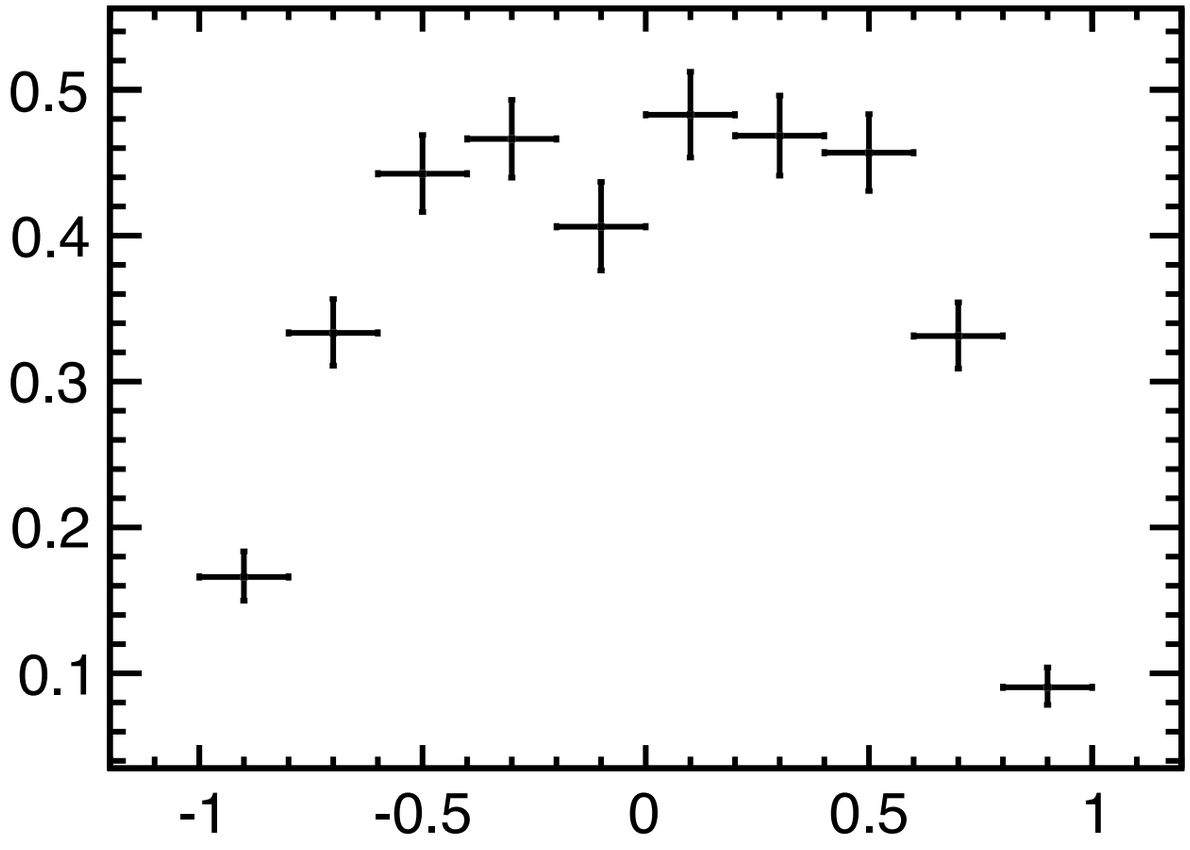
Upper limit = calculated upper limit by poisson ×MVA suppression ratio

※ 95% upper limit

Efficiency



Efficiency



→ Take out $\cos\theta_\gamma$ from MVA, tighten E_γ cut

→ Re-plot the efficient