

2013_05_16_labmeeting

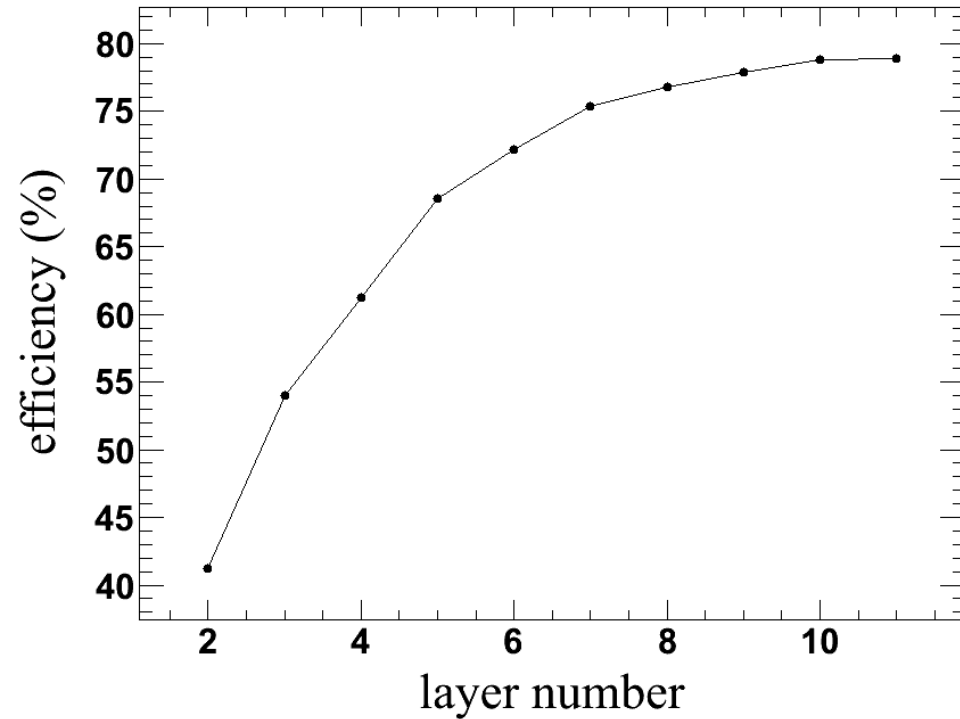
Korea Univ.

Nuclear Physics Lab.

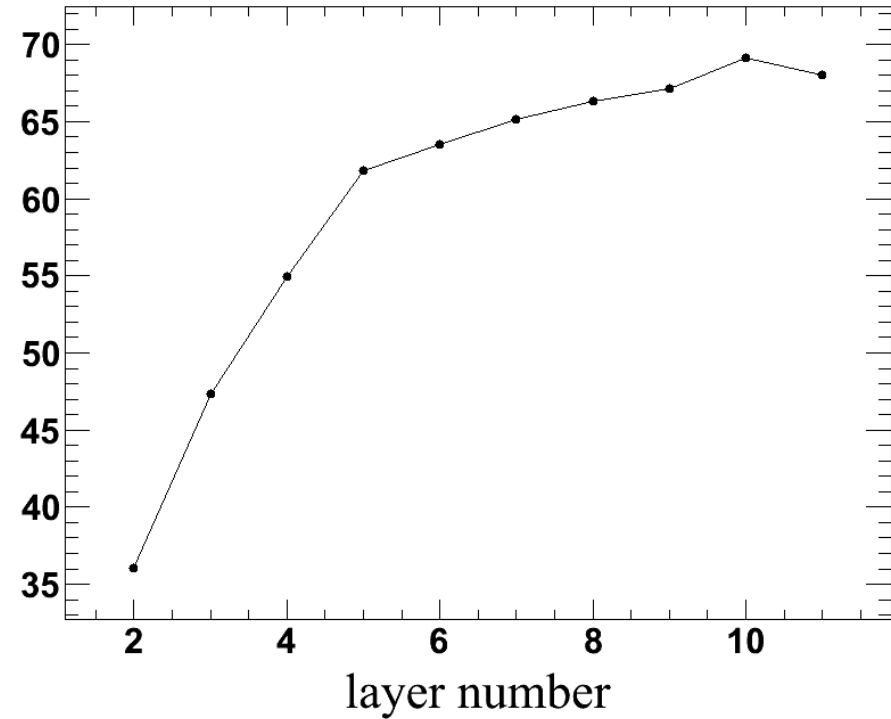
Eunah Joo

1n 100MeV efficiency

No geometric condition

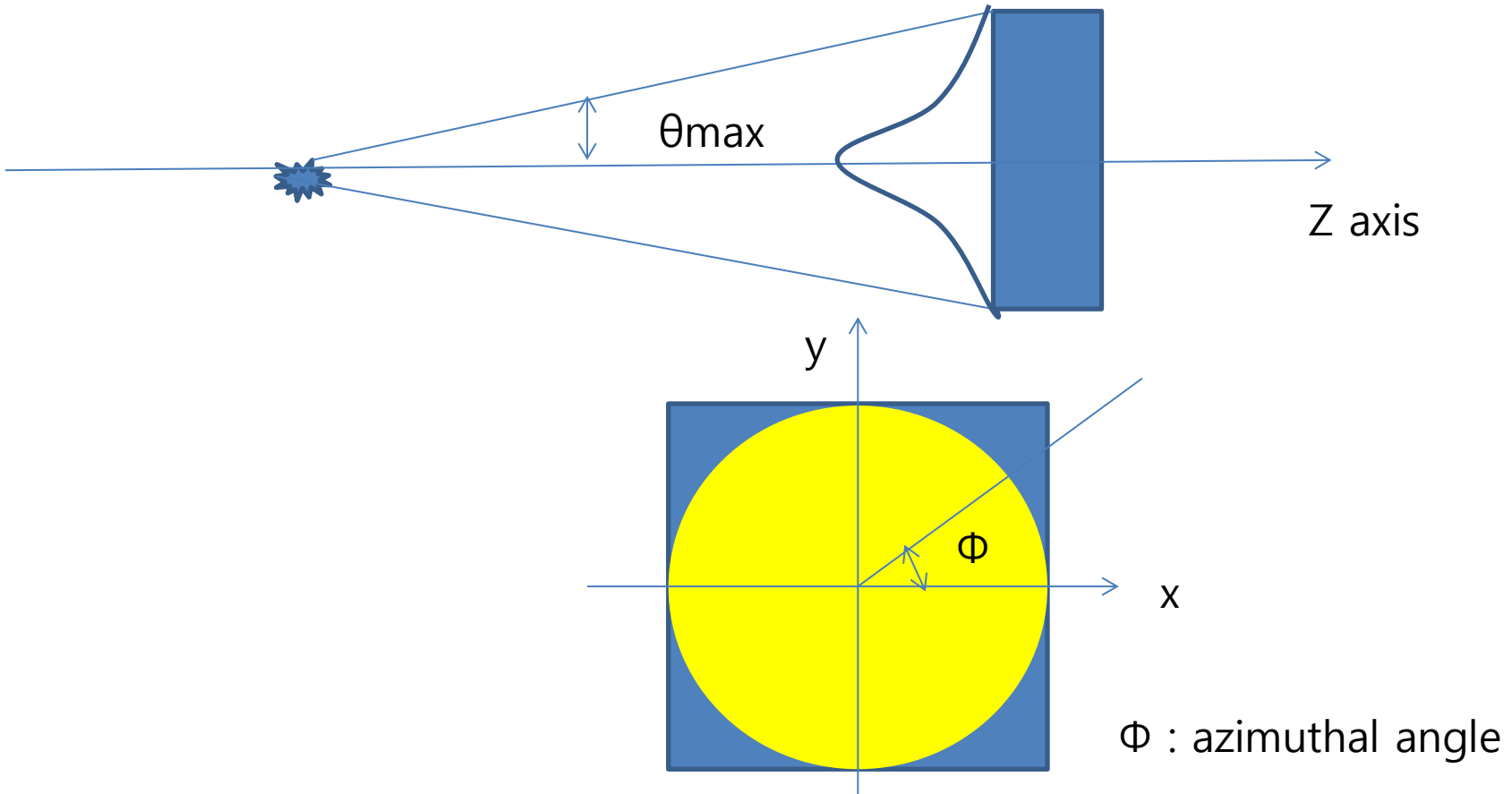


Geo cond. : 1, 2 layer only



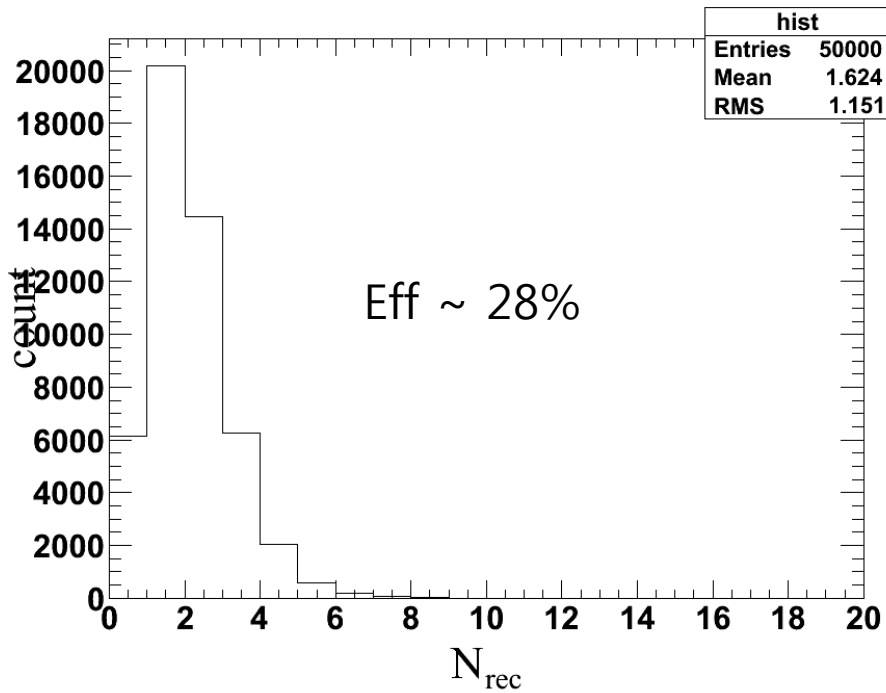
-> Stack(double layer) 개수를 6개 정도로 하기로 함.

Beam randomizing

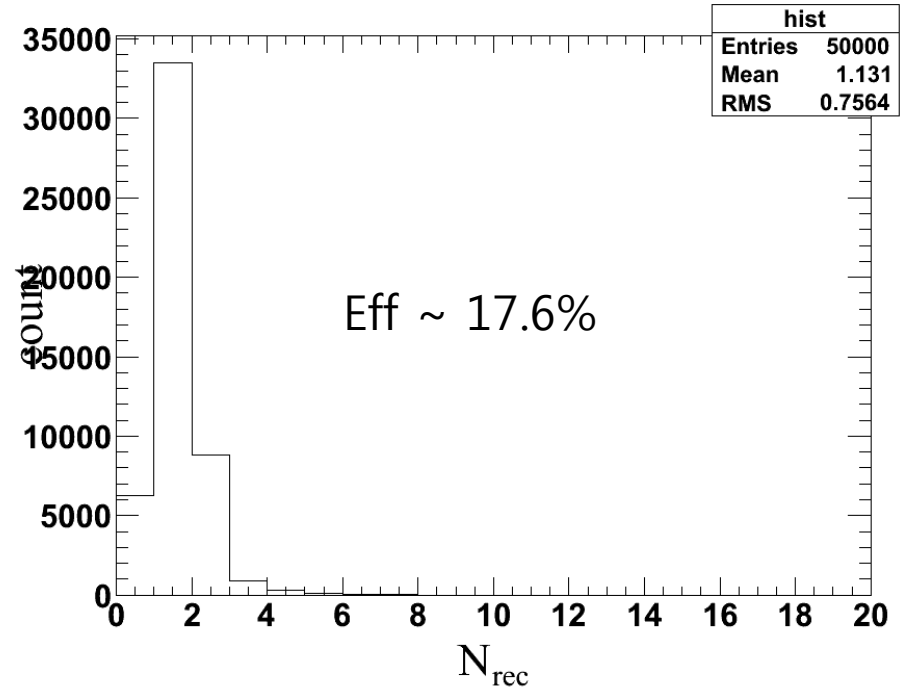


- Energy : 30~300 MeV, flat random
- Theta : gaussian random ($0 \sim \theta_{\max}$)
- Phi : flat random

2 neutron recognition by algorithm

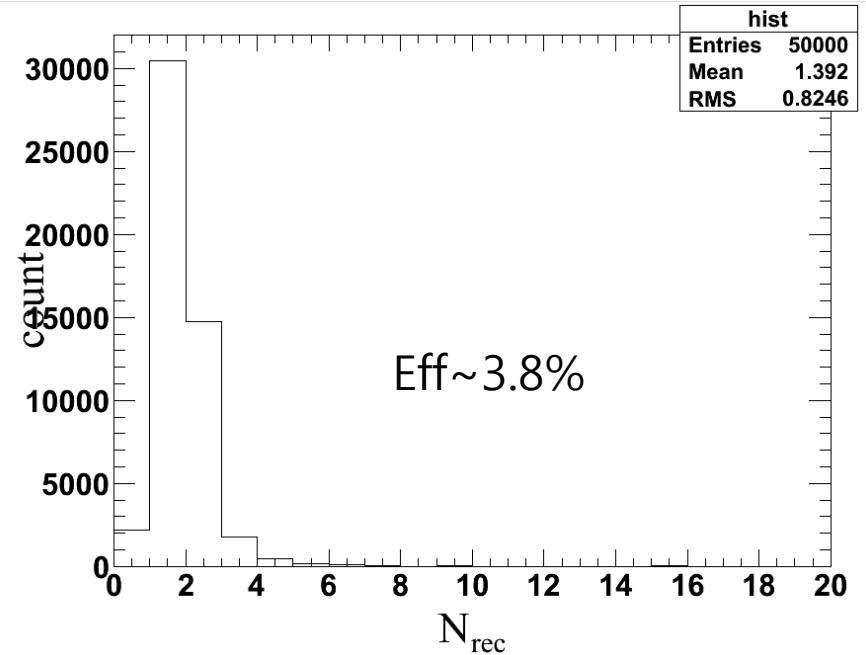
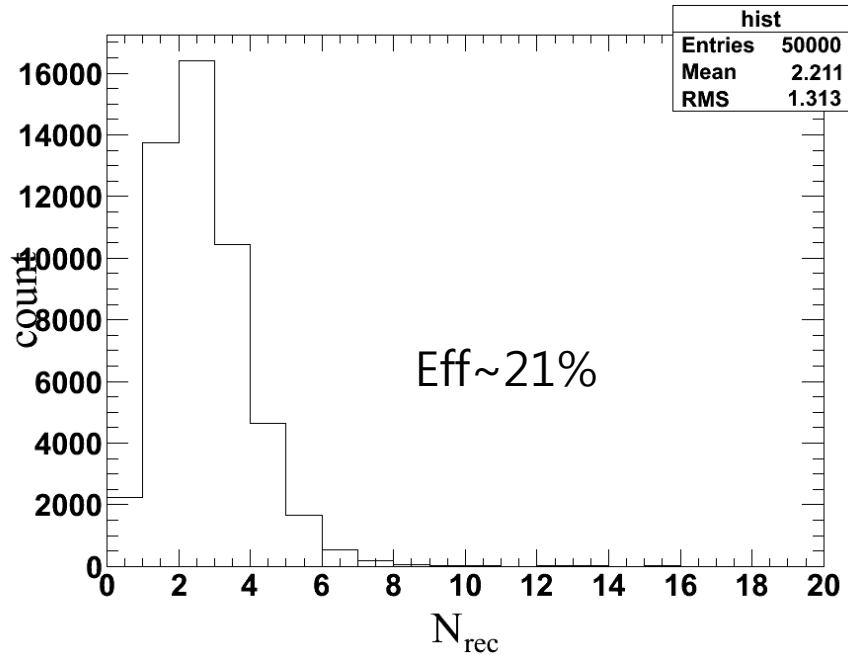


No geometric condition



3n recognition

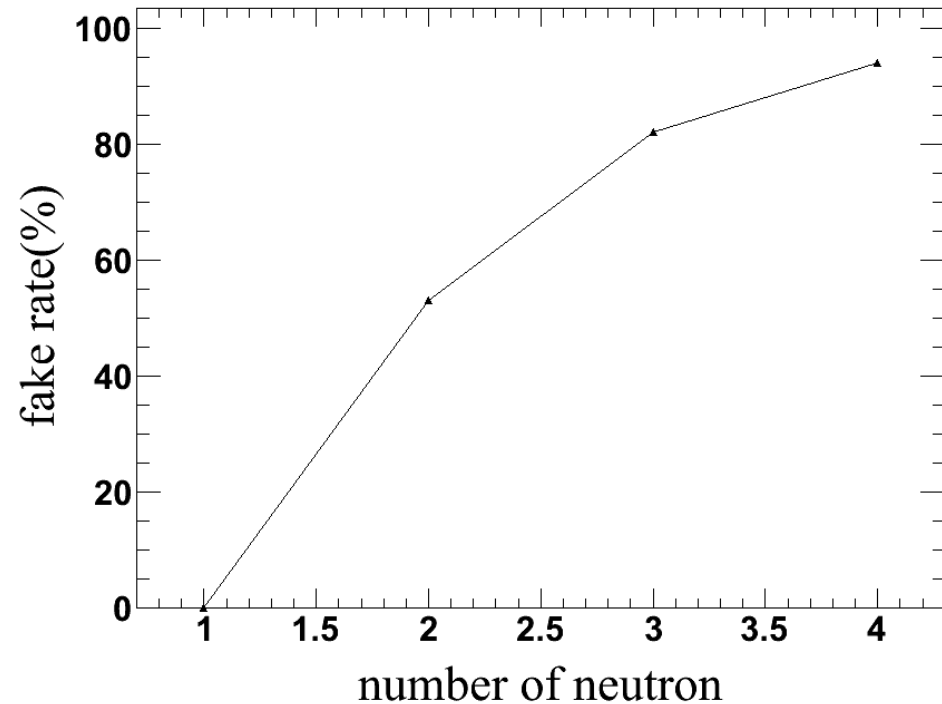
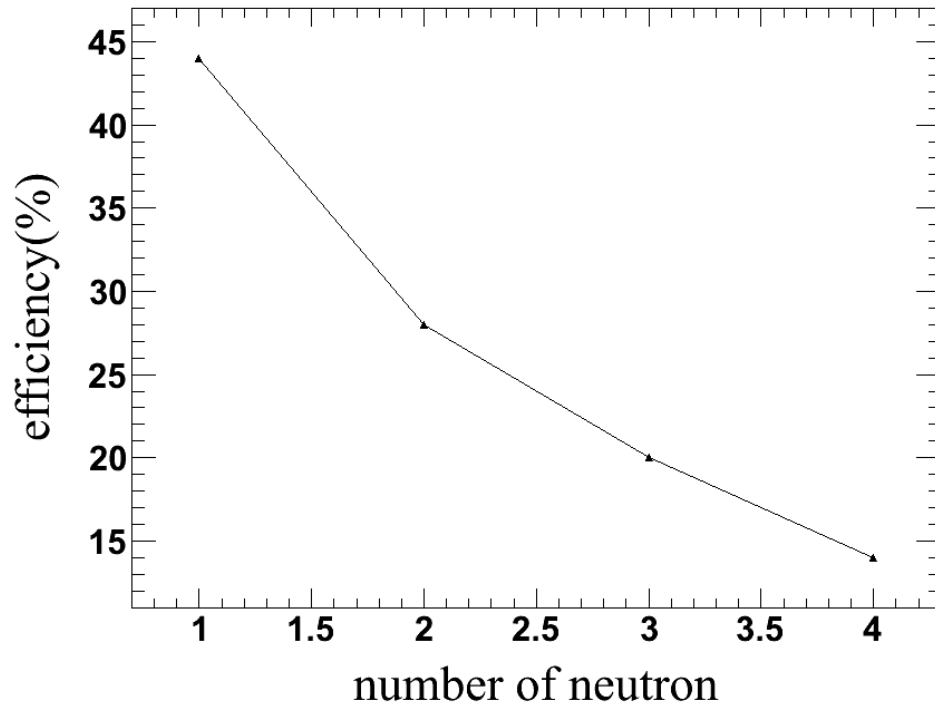
No geometric condition



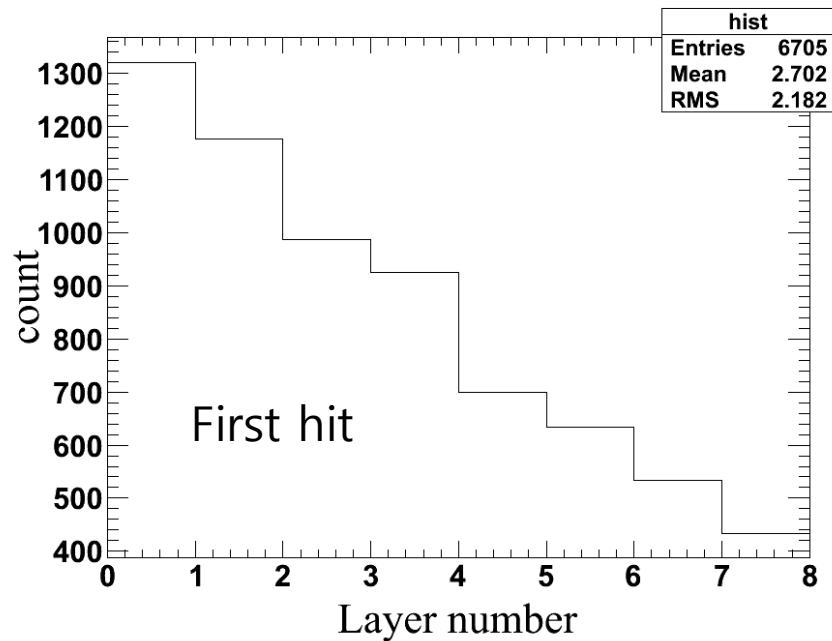
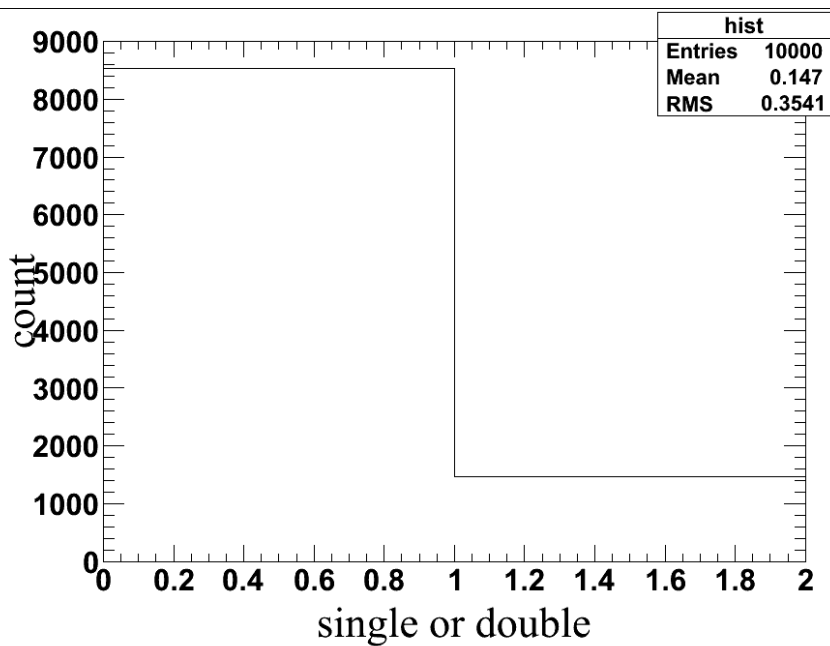
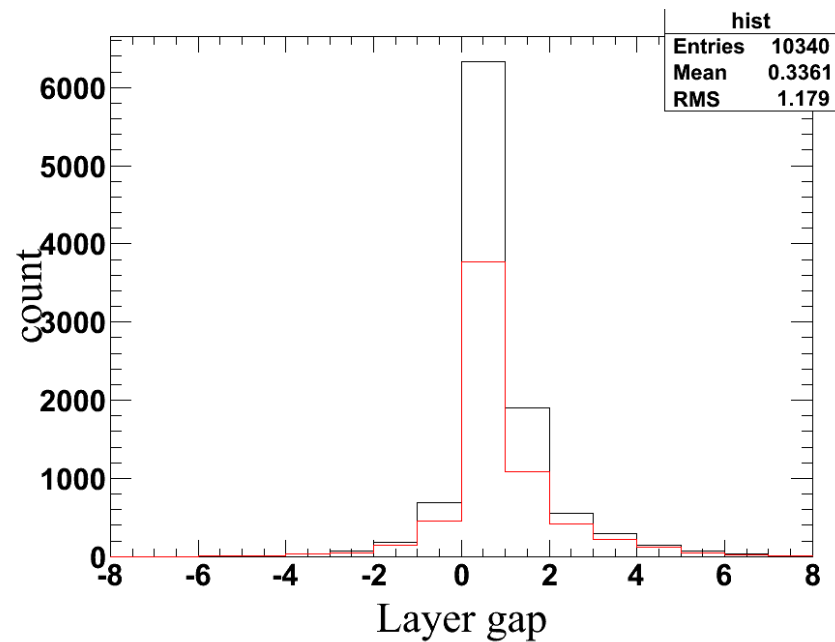
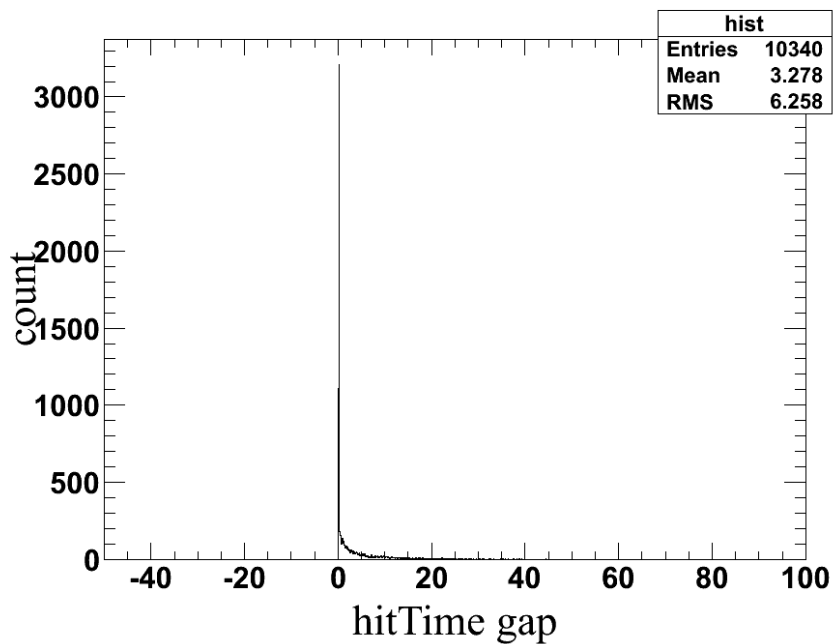
-N의 개수가 적으면 geometric condition이 tight하지 않을 때 효율이 높음

-N의 개수가 많아질수록 geometric condition이 중요해짐.

Efficiency and fake rate of algorithm



Fake rate : algorithm상에서는 조건을 만족시키지 못했지만 개수를 제대로 추측한 경우



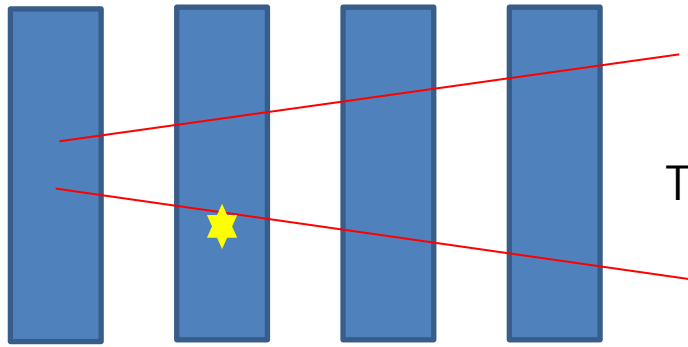
최적화해야 하는 조건들

- threshold (3MeV)
- cluster size(geo condition)
- gap btw stacks(double layer)

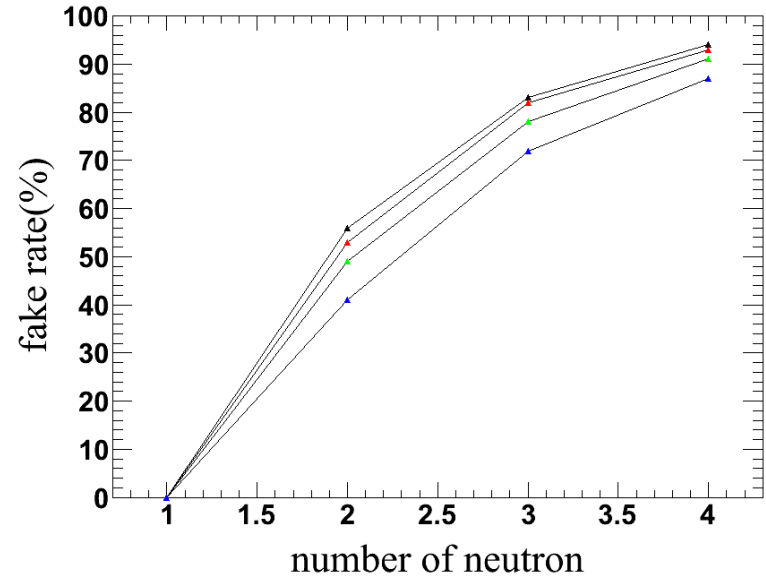
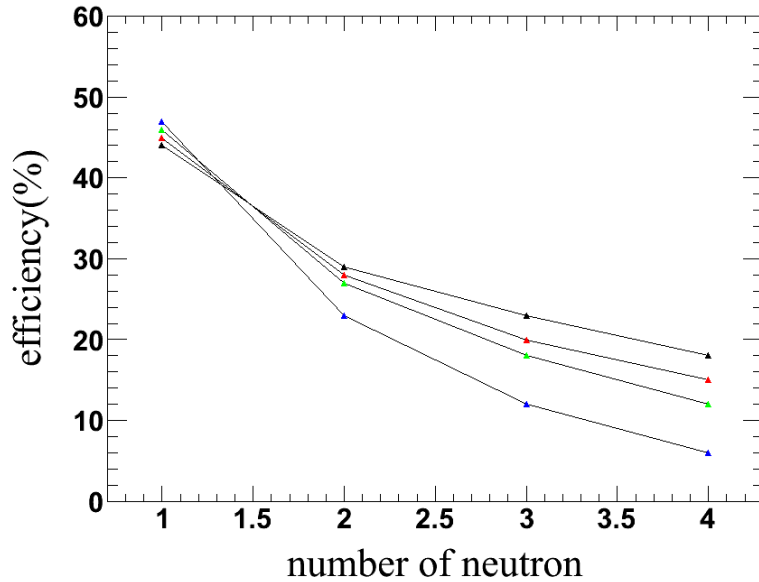
좀 더 향상시킬 수 있는 부분들

- Earlier come, fore layer? (is there significant back scatterings?)
- stack 수를 6개로 늘리기 -> efficiency 향상

Efficiency & fake rate of old algorithm (something was wrong!)

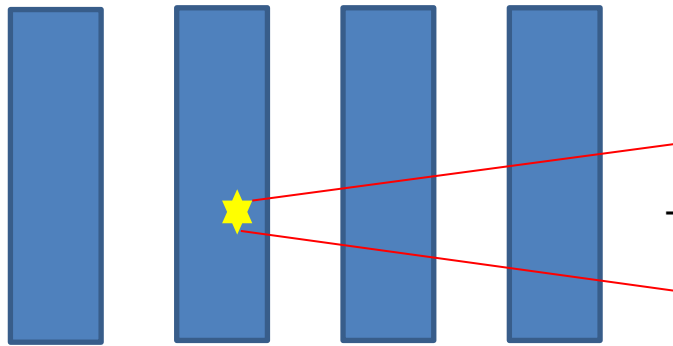


Threshold : 1(black), 3(red), 5(green), 10 MeV(blue)

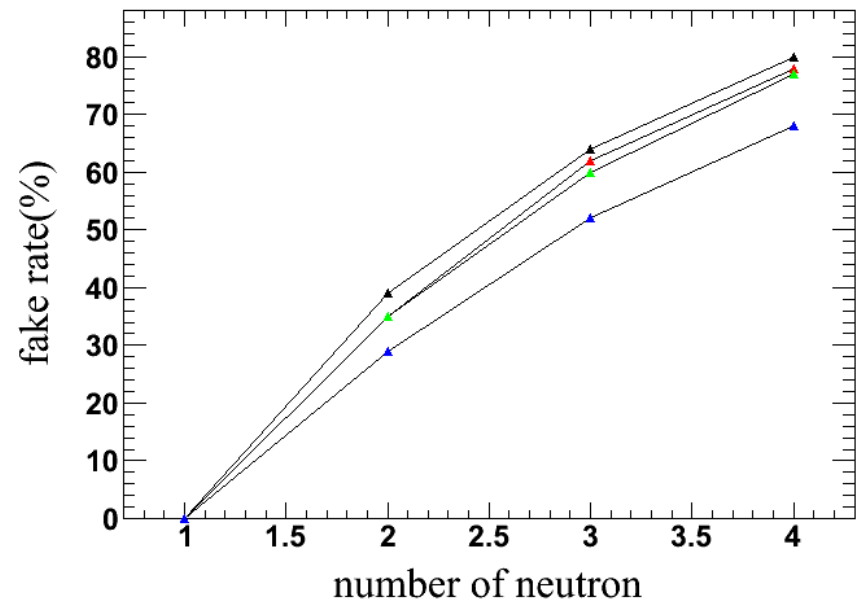
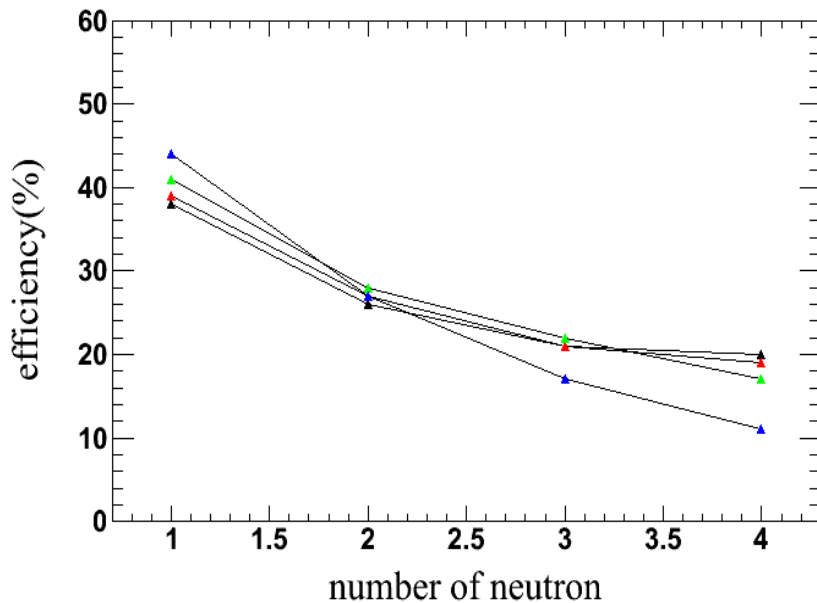


- Fake rate : n 개수를 잘 맞췄지만 사실 알고리즘은 만족하지 못한, 우연히 제대로 된 n 개수를 얻게 된 경우.
- 4 stack, 간격 30cm.

Efficiency & fake rate of new algorithm



Threshold : 1(black), 3(red), 5(green), 10 MeV(blue)



- 문제점 : back scattering 뿐 아니라 동시에 여러 입자가 나와서 layerNum이 뒤바뀌는 경우
- 개선방안 : stack 사이의 거리를 늘리고(>50cm) hitTime의 간격이 그 거리를 가는 시간 이하가 되는 경우 다른 중성자에 의한 hit이라고 제외시키지 않는 방법.