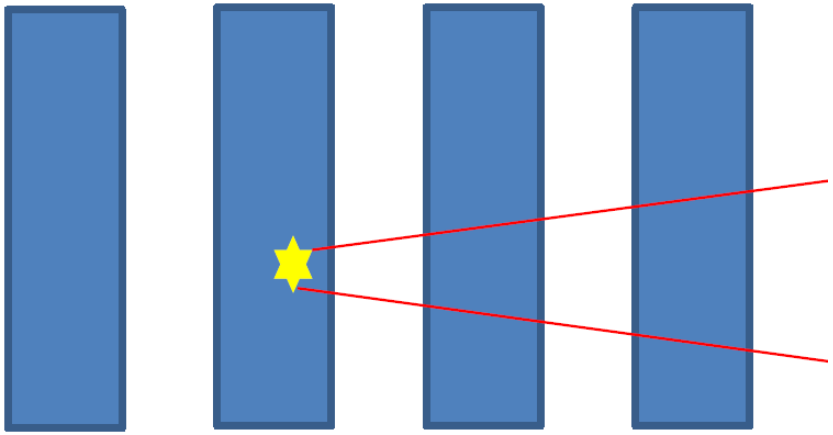
Neutron Detector Simulation
2014 / 01 / 16



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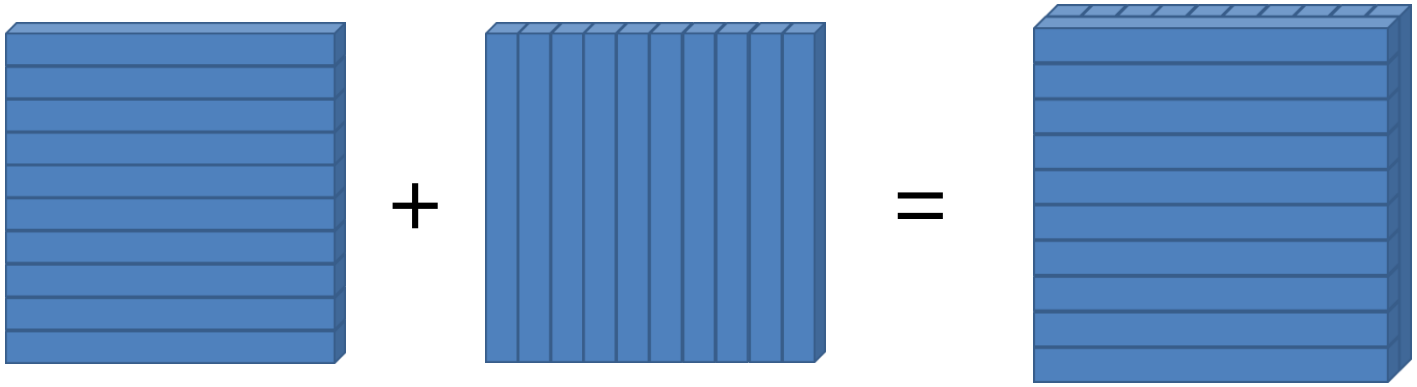
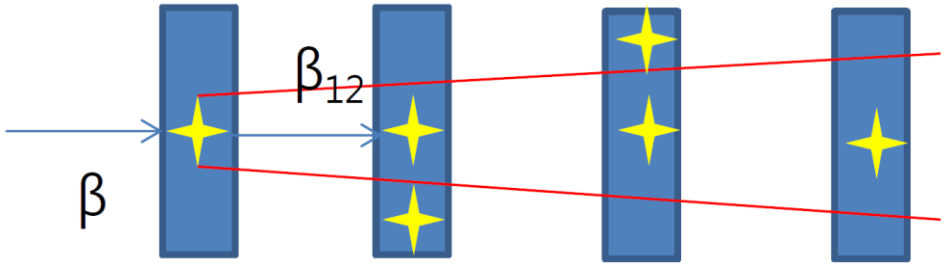
(Back Up)Neutron Bar Detector



Horizontal Vertical Stack

- Horizontal layer + Vertical layer = 1 Stack
- Structure to know the locations where neutrons have passed.
  → To recognize the path where neutrons have traveled.

(Back Up)Multi-neutron Recognition Basic Conditions



1. **Geometric Condition**

- 1st layer : within 30 cm from 1st hit.
- 2nd layer : 40 cm
- 3rd layer & 4th layer : 60 cm

2. **Betha Condition**

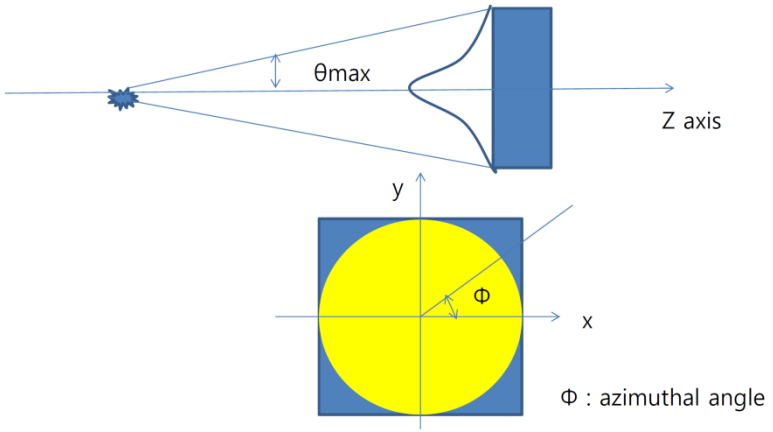
- $\beta > \beta_{12}$: earlier incoming, larger velocity(loss of energy).

3. **Back Scattering**

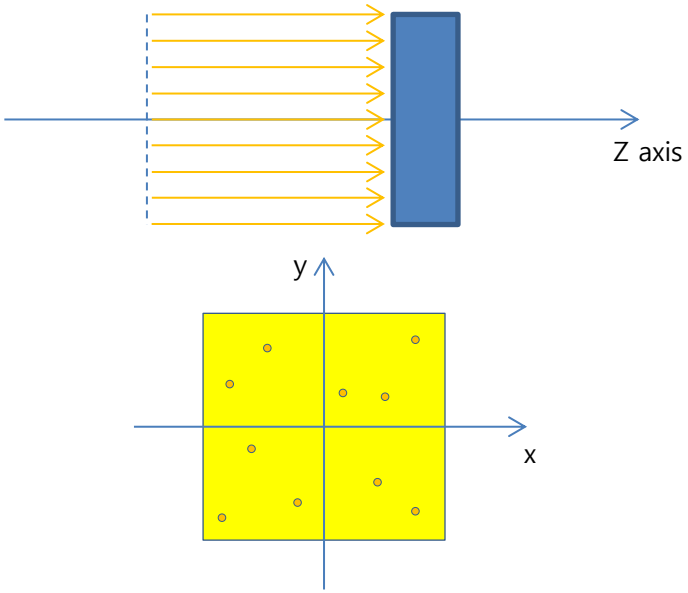
- Particles can be bounce off the next stack.

Beam Conditions

- **Realitically Randomized Beam**



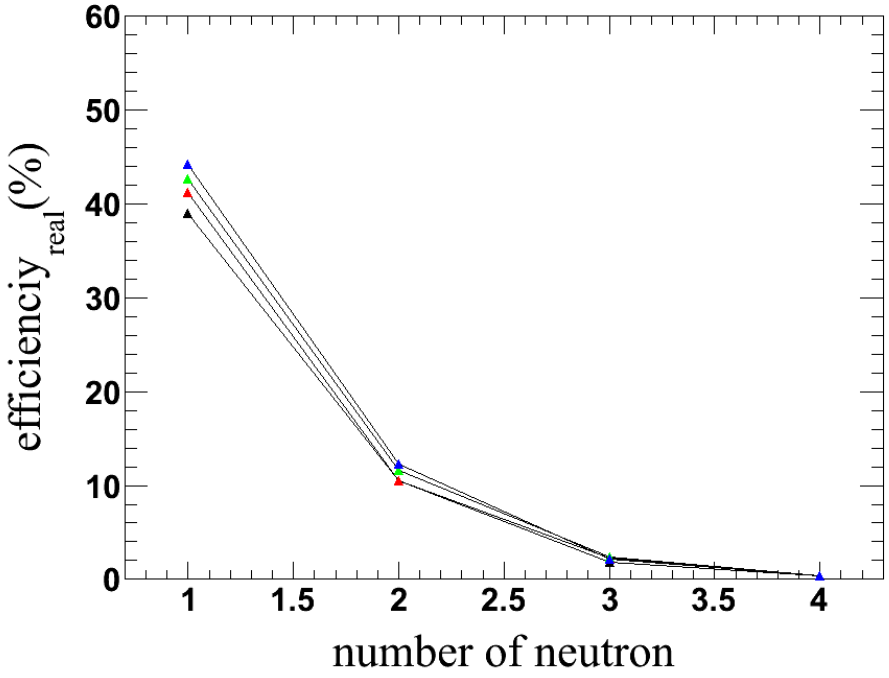
- **Basically Randomized Beam**



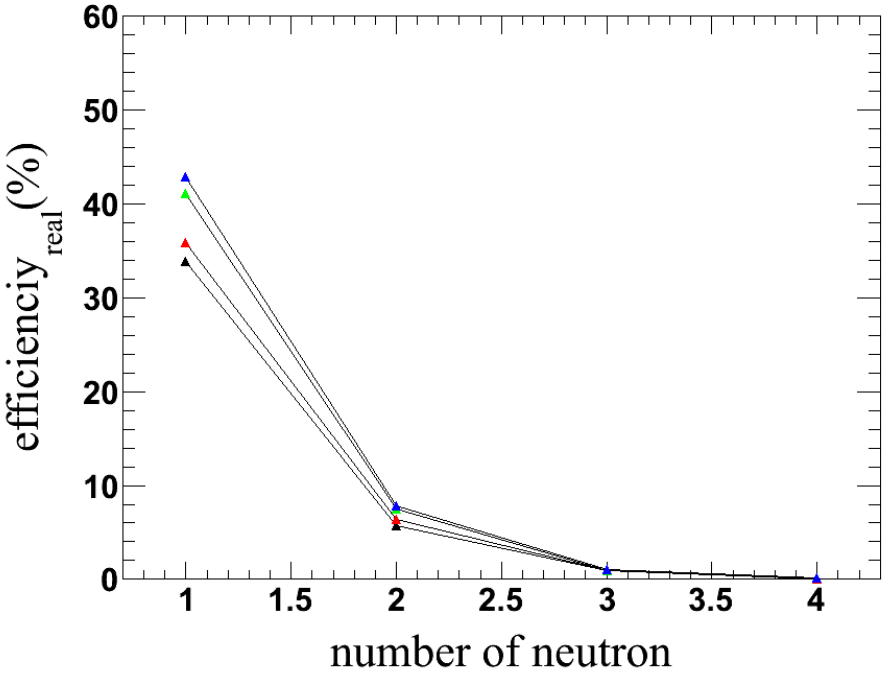
Result

Black : 3 MeV
Red : 5 MeV
Green : 7 MeV
Blue : 10 MeV

Realitically Randomized Beam



Basically Randomized Beam



- **Threshold 가 높을수록 efficiency 가 높은 이유??**

Next Step

I. **Apply one of three basic conditions & See the real efficiency.**
   - **Geometric Condition**
   - **Beta Condition**
   - **Back Scattering**

II. **Apply two of three basic conditions & See the real efficiency.**
   - **GC + BC**
   - **BC + BS**
   - **BS + GC**

III. **Change the beam into realistically randomized beam.**

Real Efficiency(%) = (# of well recognized)/(# of event-Null event) * (1-fake rate) * 100