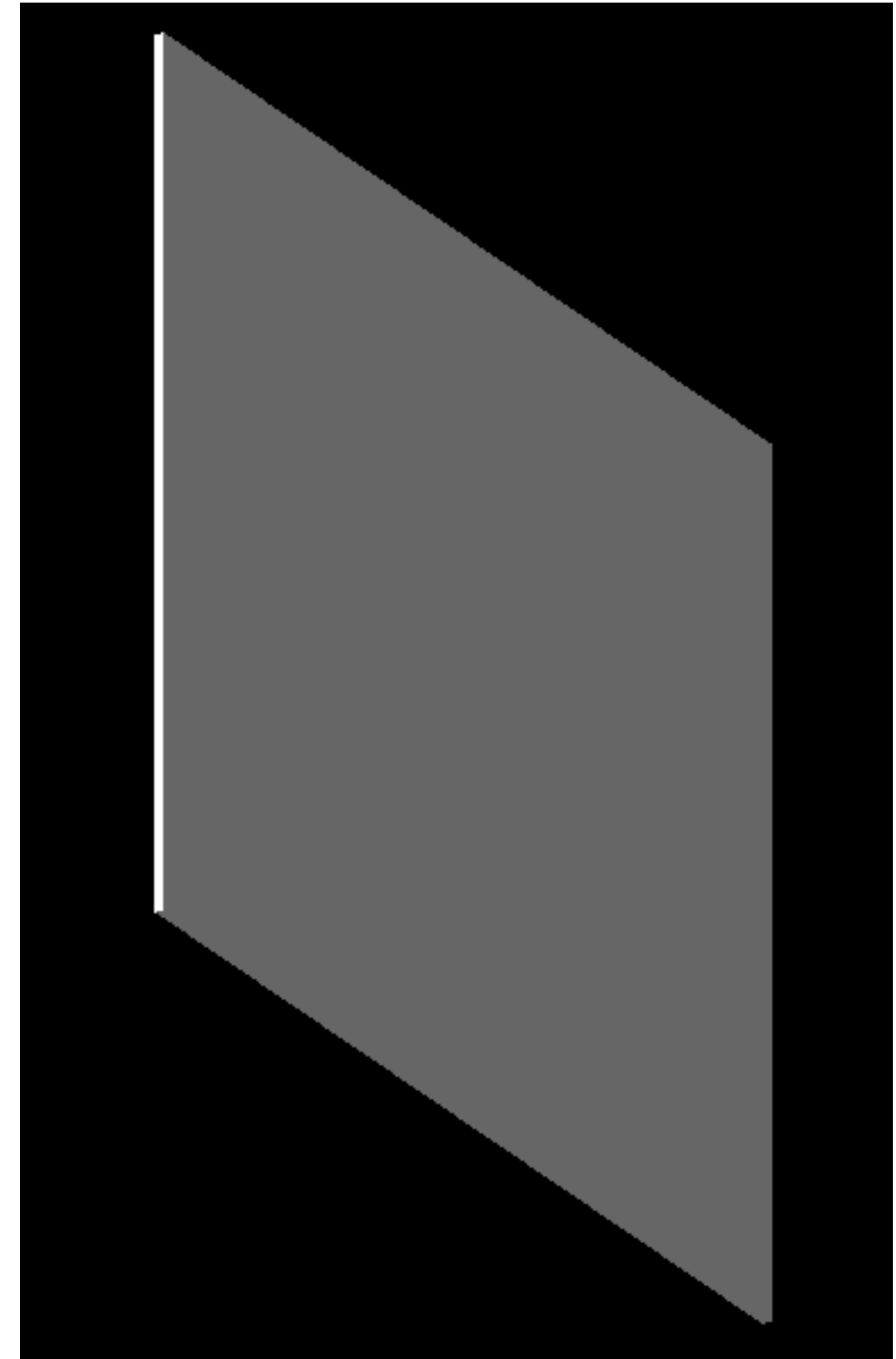


# Status report (15 Feb. 2017)

Jongwon Hwang

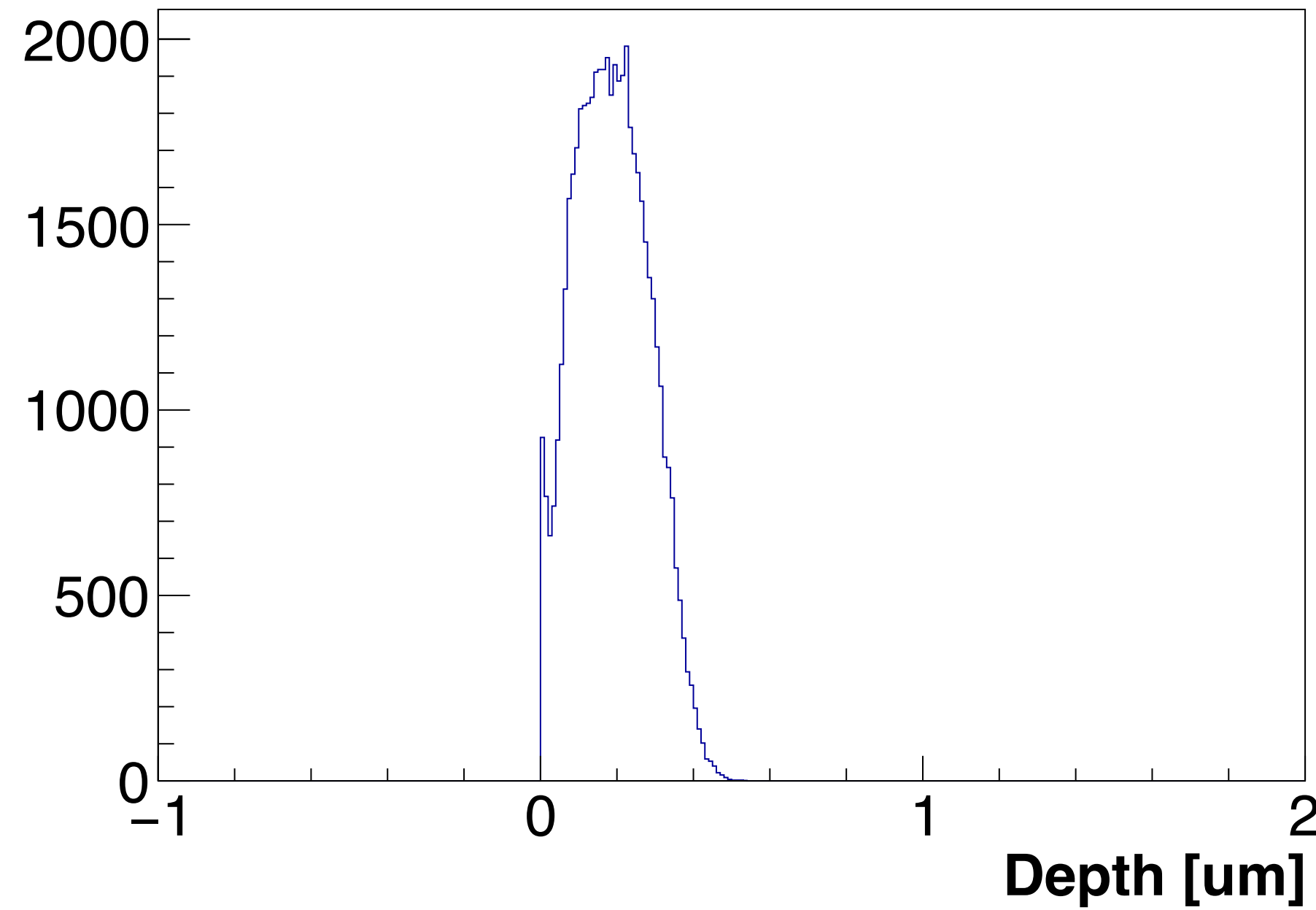
# Simulation for “doping”

- Triton result (200 keV)
  - Depth for Cu: 1.618  $\mu\text{m}$
  - Depth for Au: 1.287  $\mu\text{m}$
- Check electron beam (18 keV) from each depth for Cu and Au plates

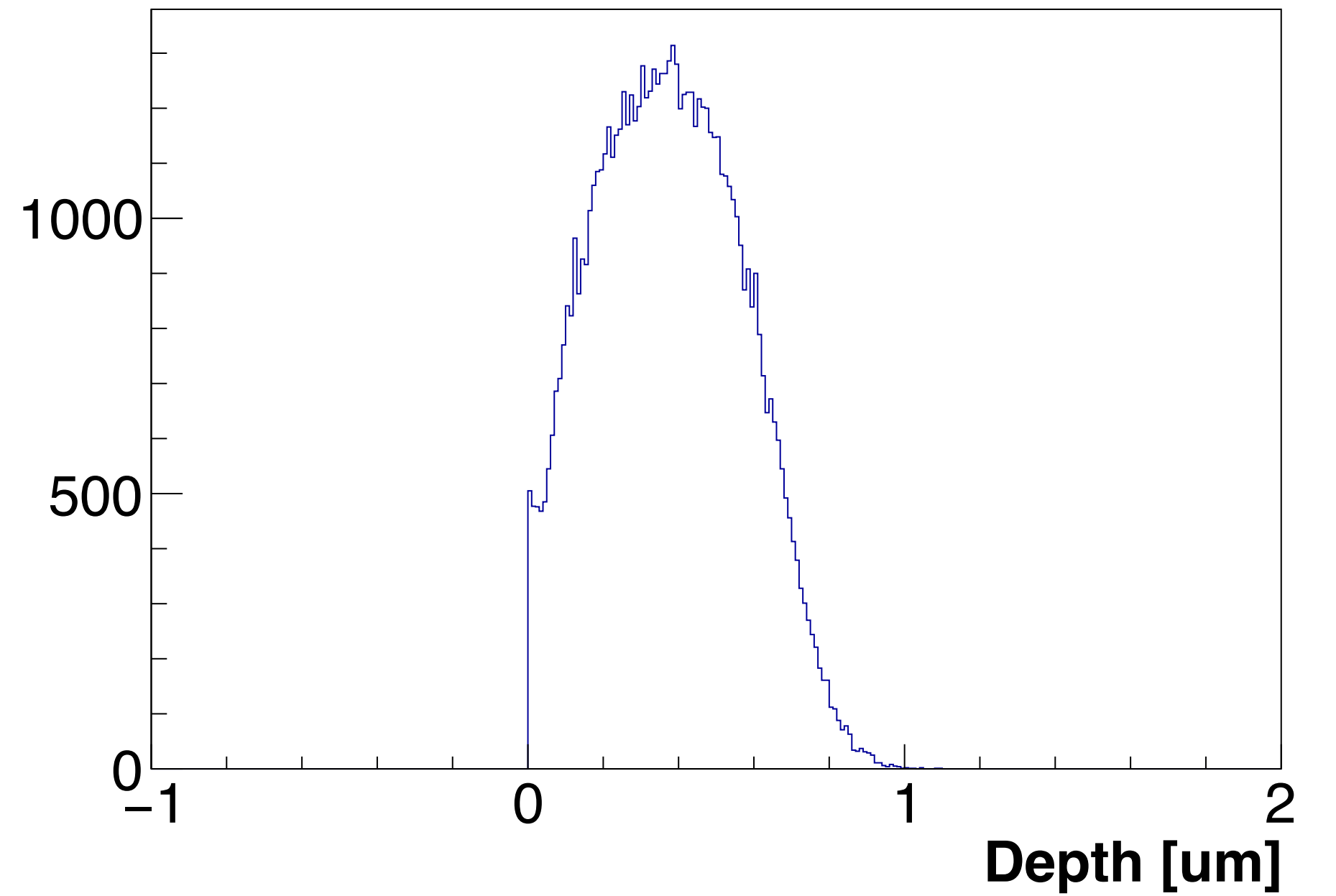


Simulation  
for  
“doping”:  
electron

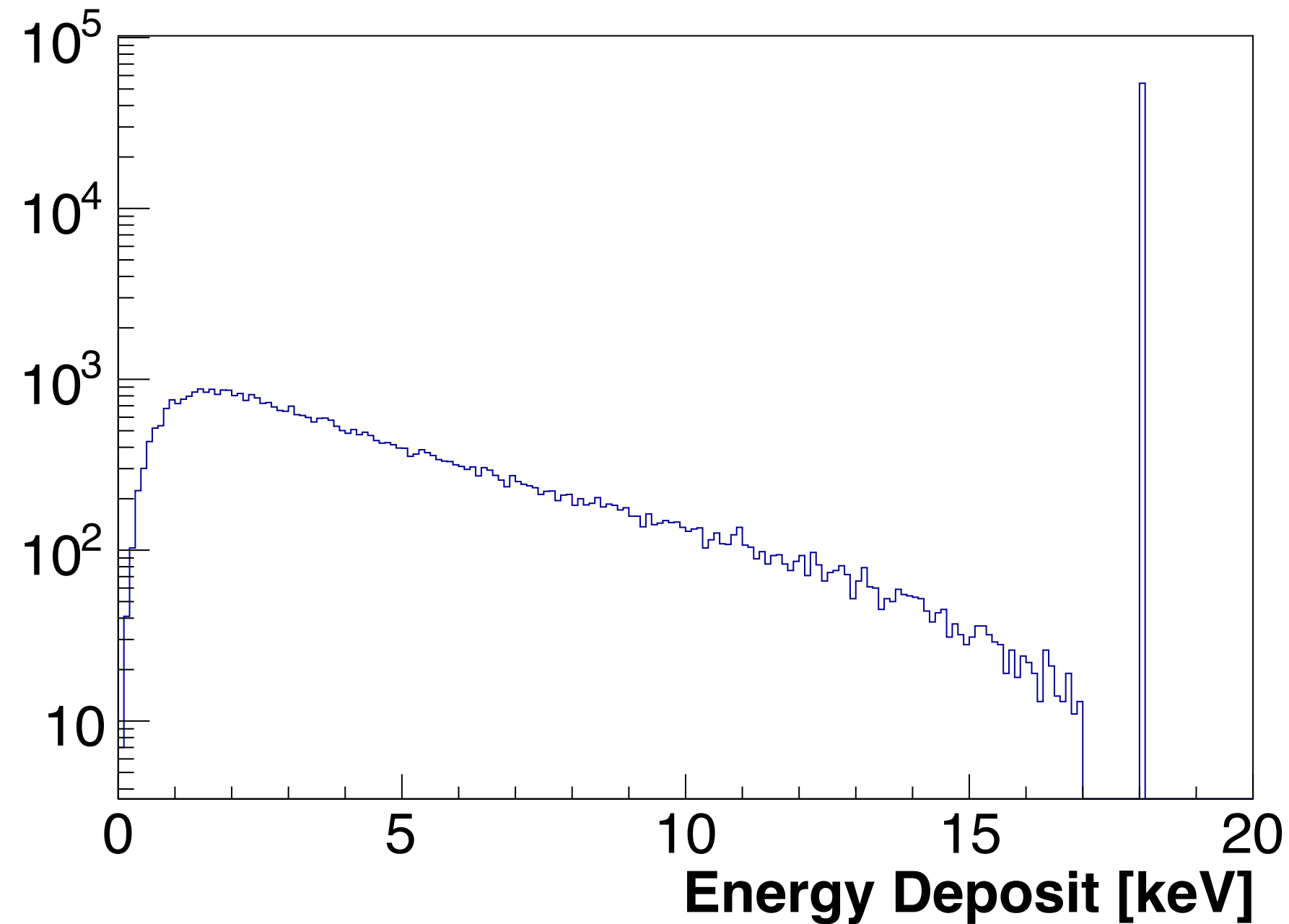
electron\_Au



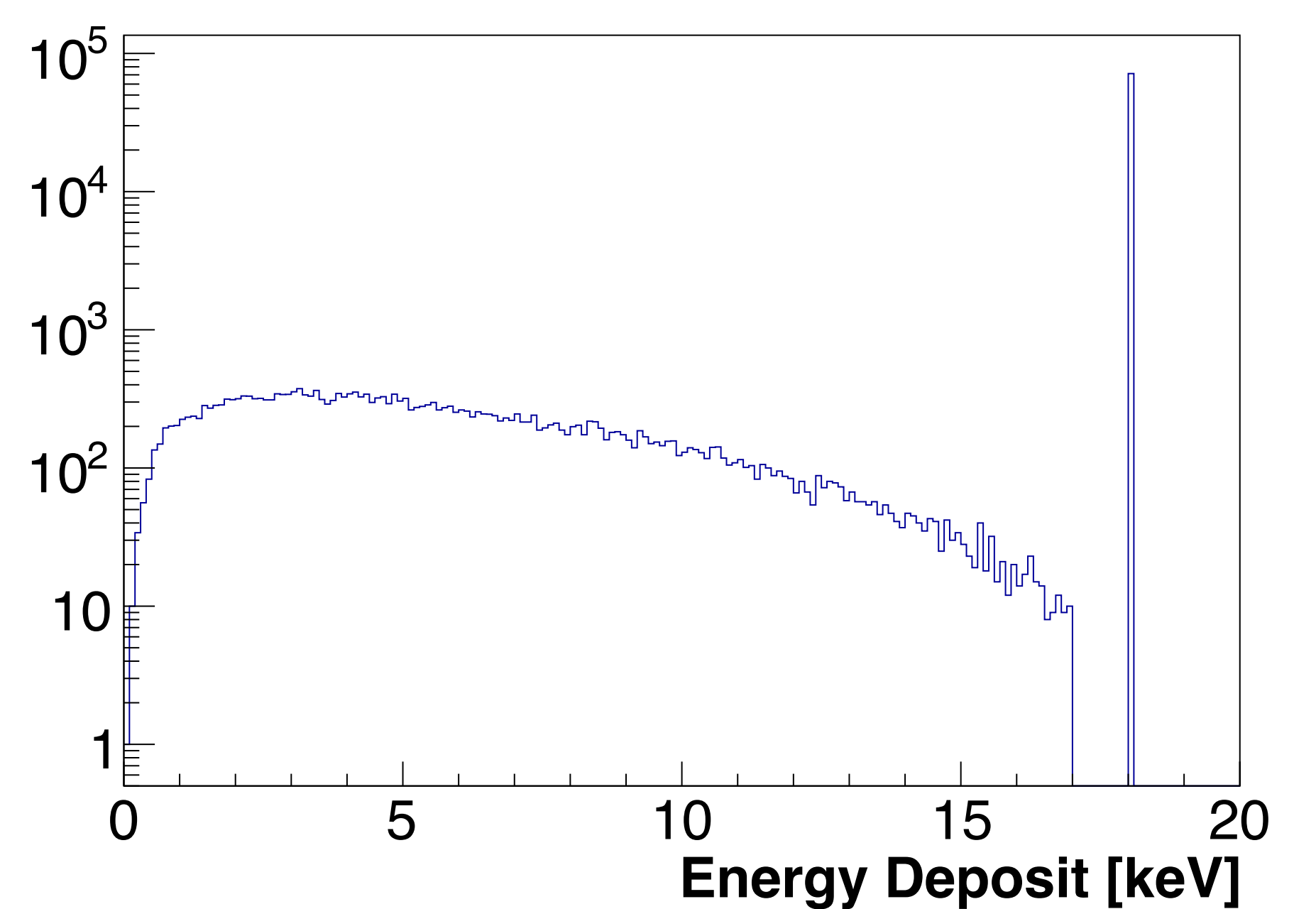
electron\_Cu



electron\_Au

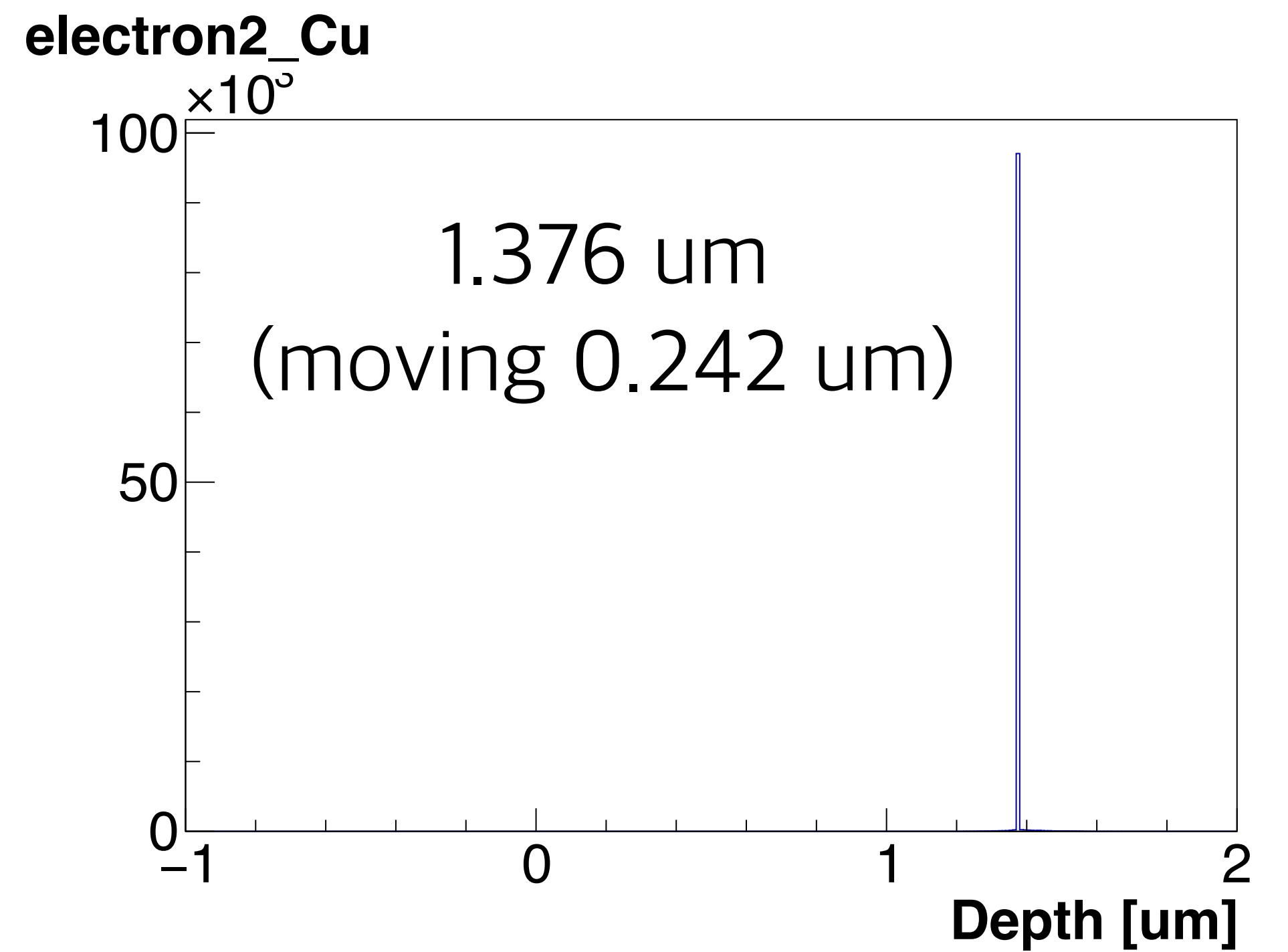
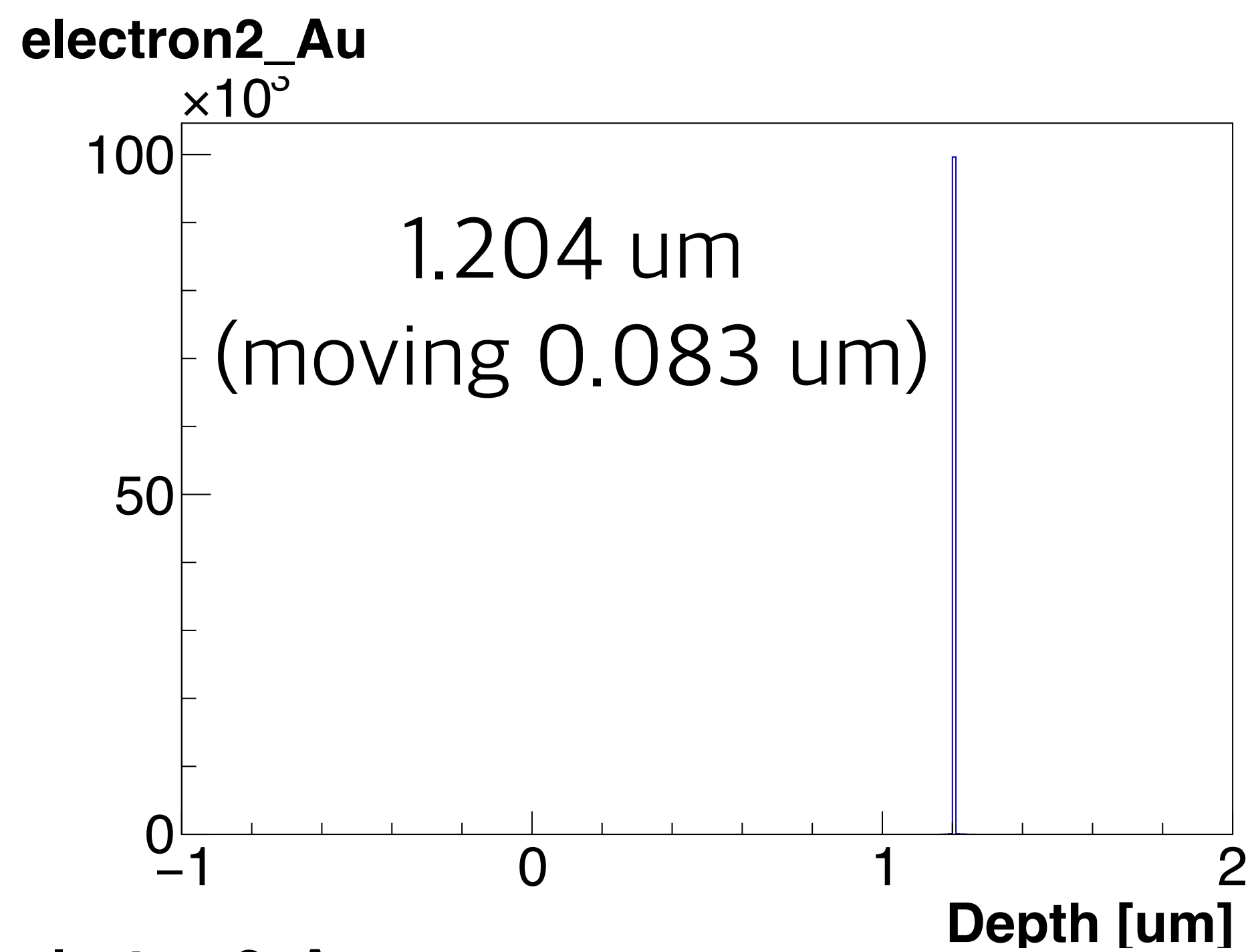


electron\_Cu

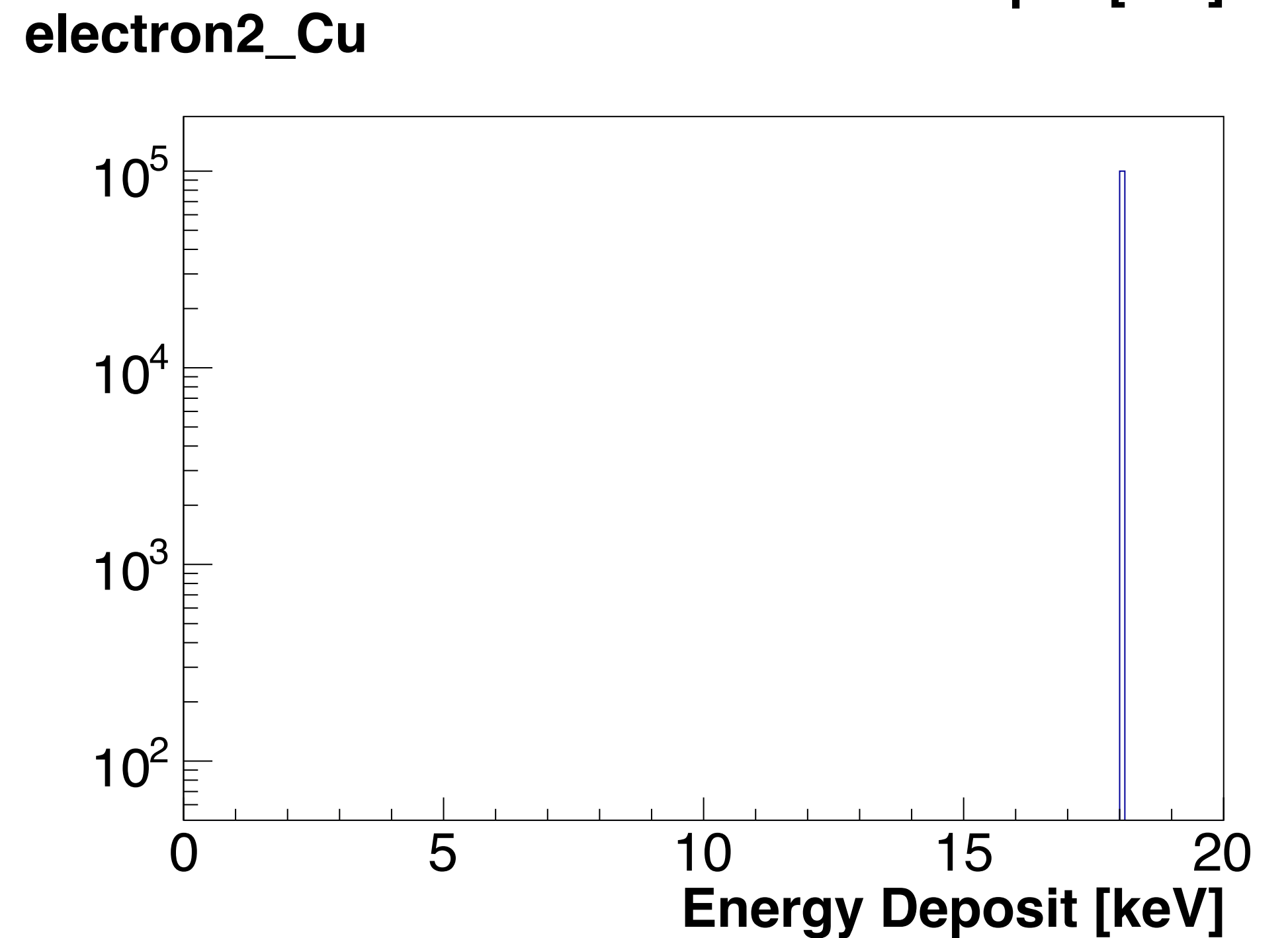
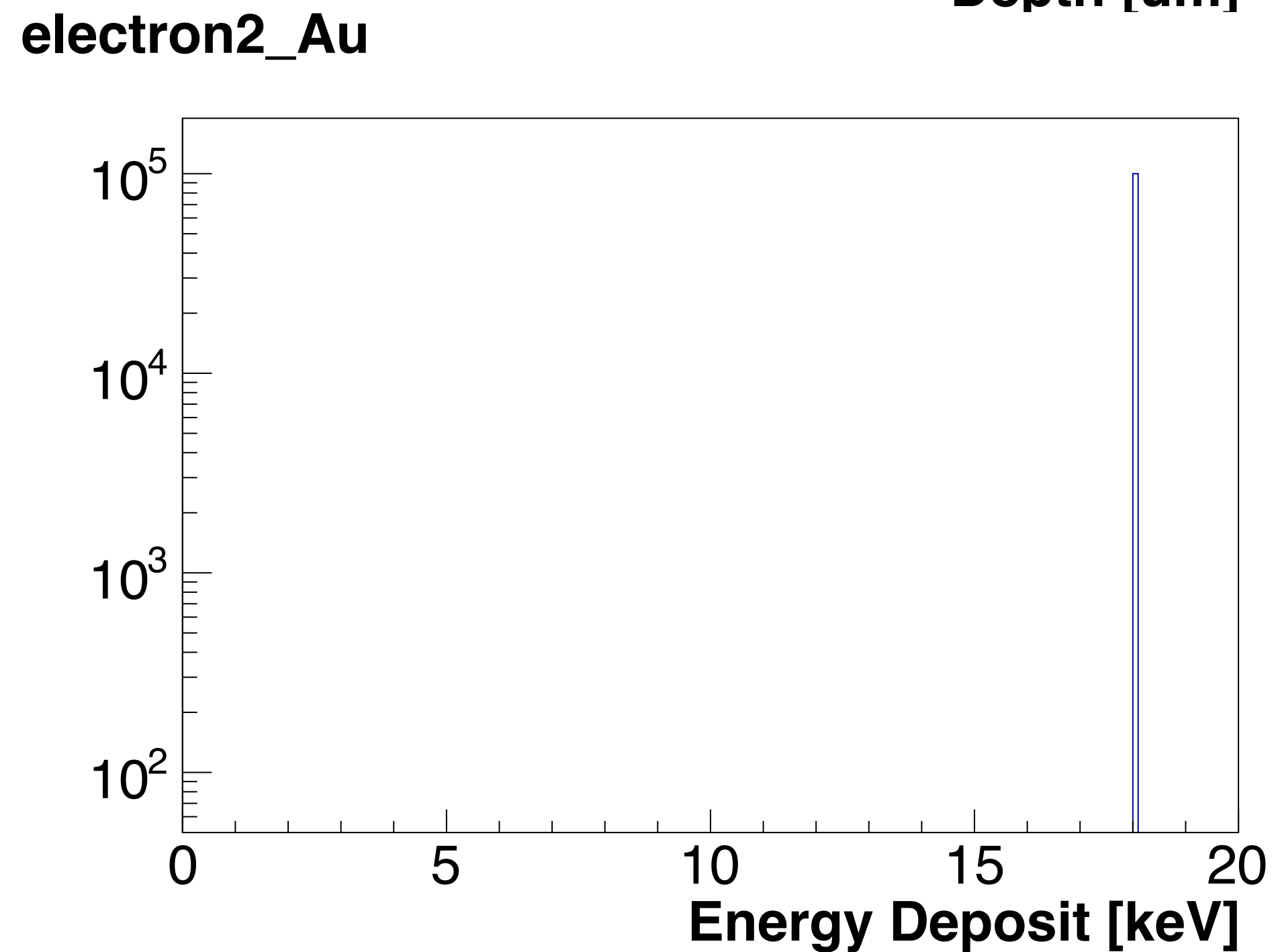


Previous  
(from outside)

Simulation  
for  
“doping”:  
electron



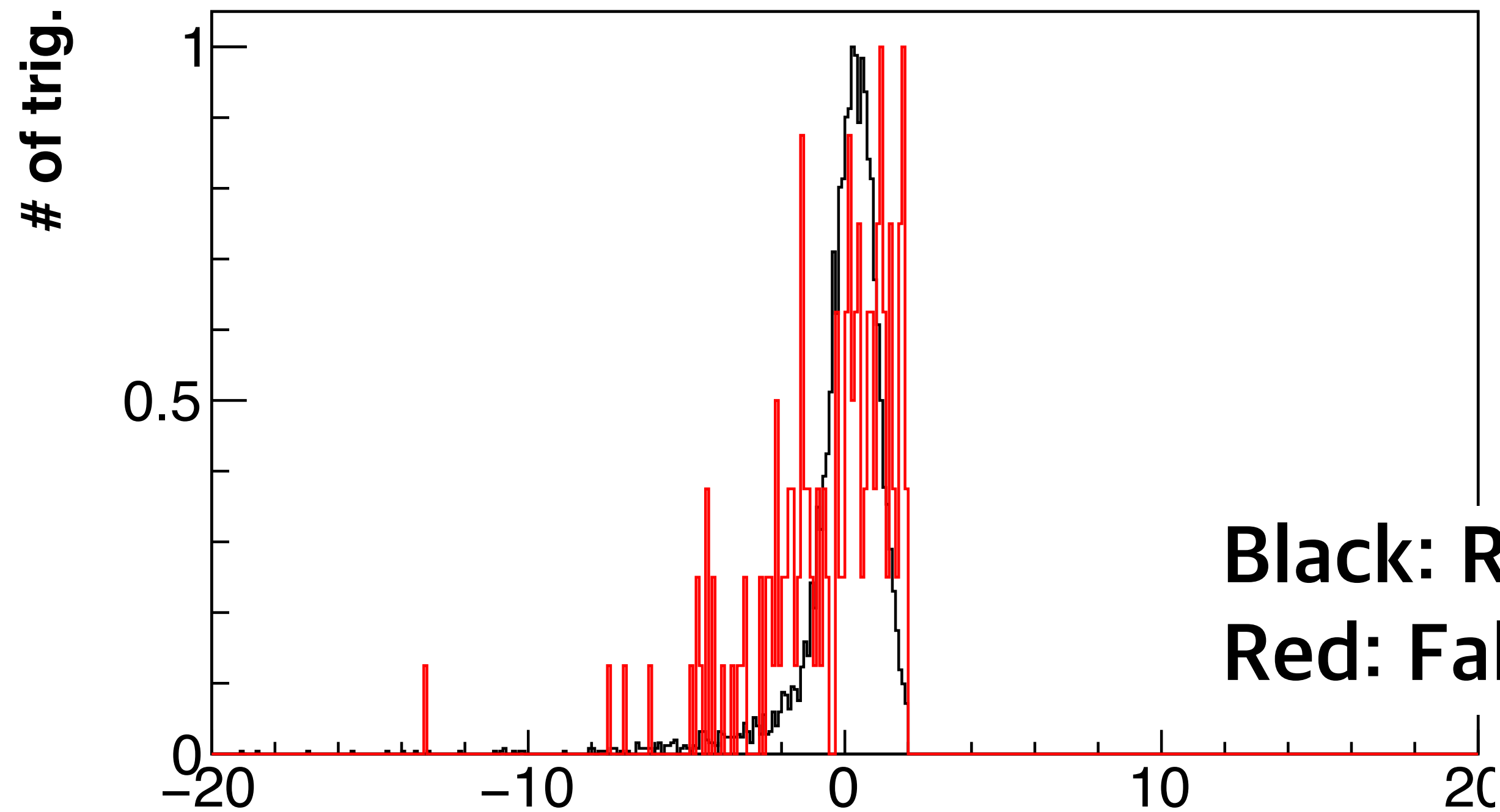
New  
(from inside)



# Simulation: cosmic-ray rejection

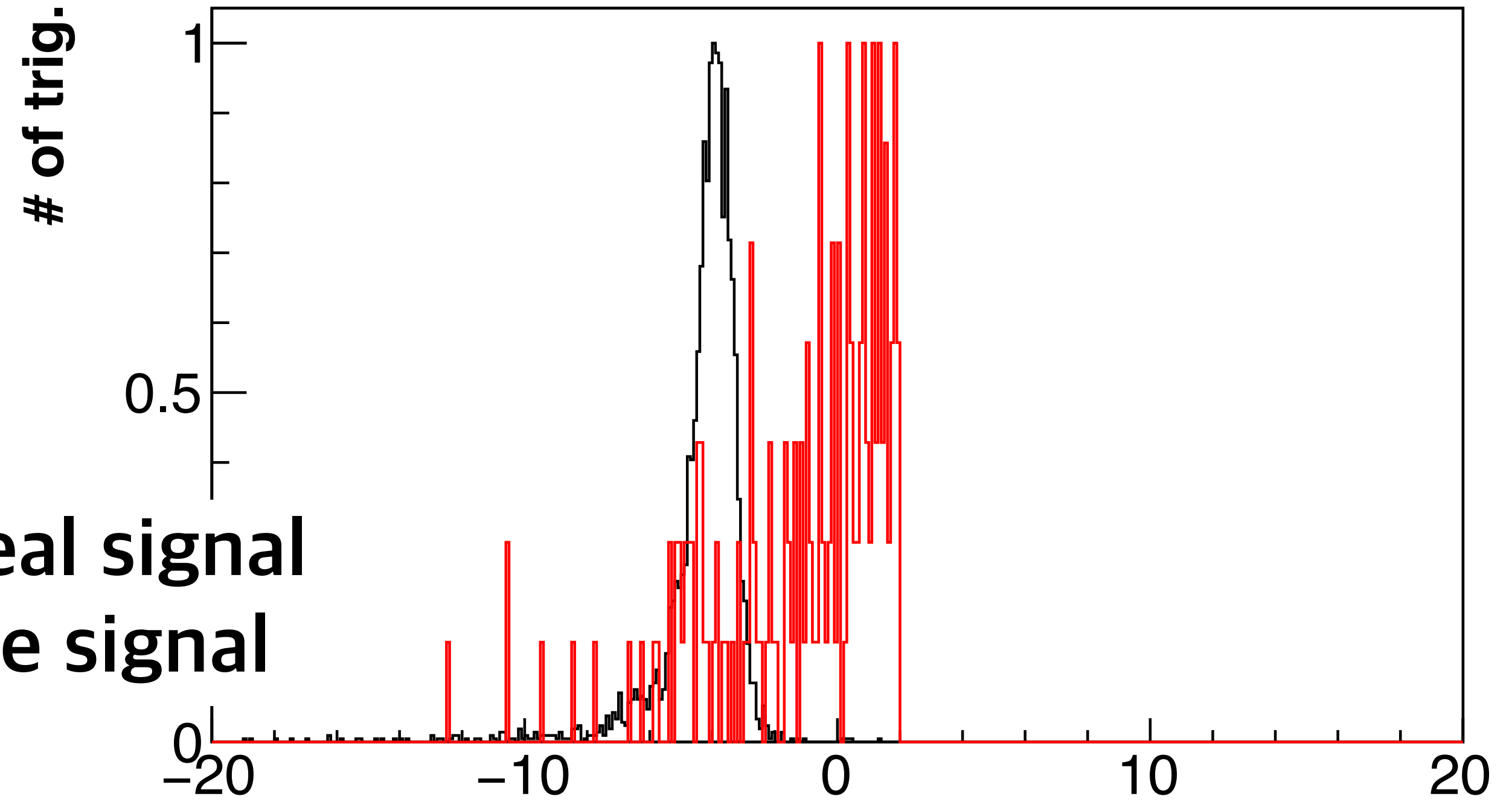
- Check  $dT = T_{\text{bot, earliest}} - T_{\text{top, latest}}$  after cosmic-ray rejection

DT. (825/Top)



DT. (825/Bot)

**Black: Real signal**  
**Red: Fake signal**



**Result might not be improved by adjusting dT cut.**

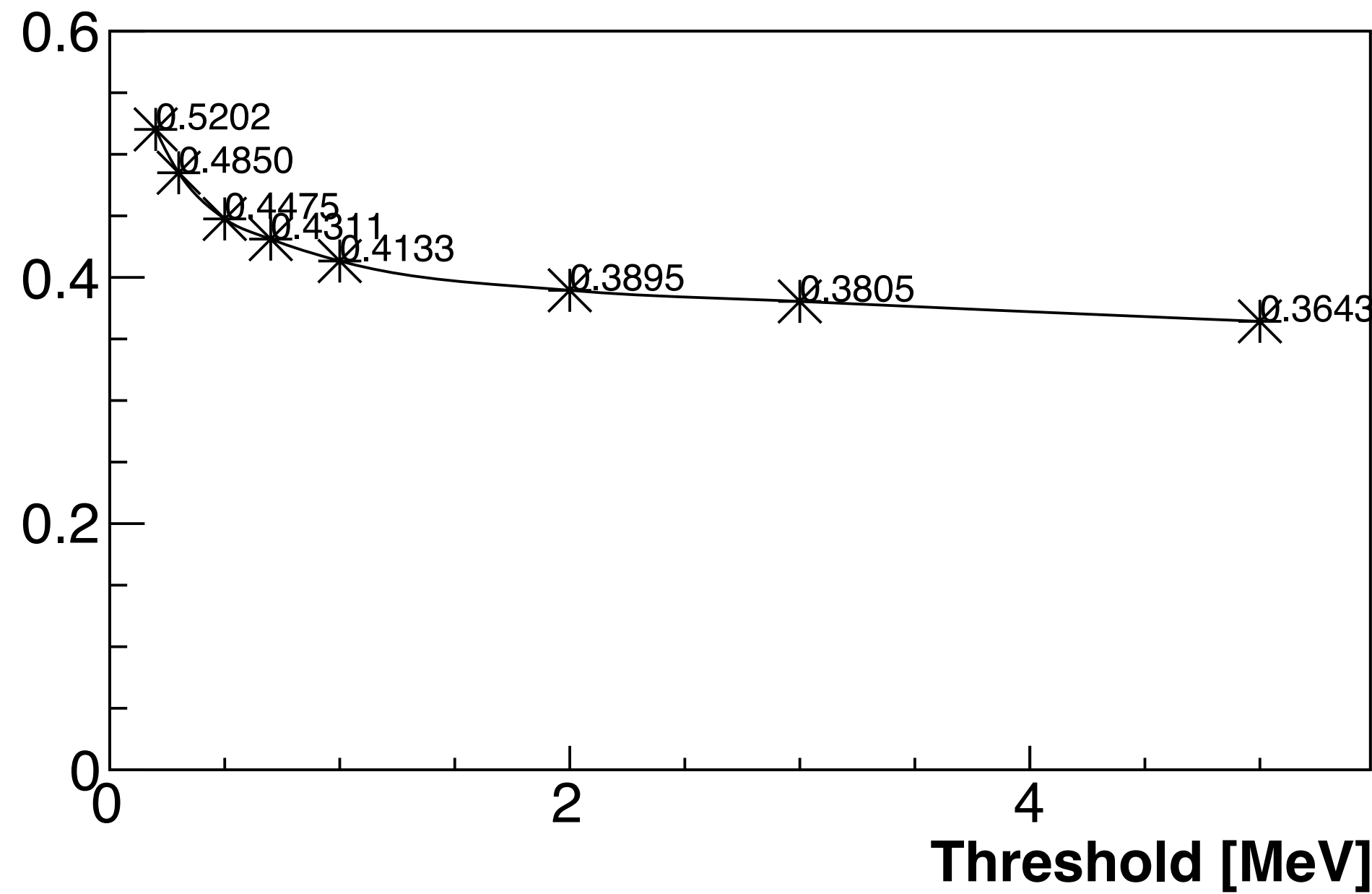
# Simulation: Another algorithm

- 2nd algorithm
  - compare all combination of hits between those for Top/Bottom detector OR,
  - just consider the combination of the **latest hit at Top** and **earliest hit at Bottom**.
- 3rd algorithm
  - 2nd algorithm & (# of hits)  $\geq 3$
  - Neglect all events with less than 3 hits.

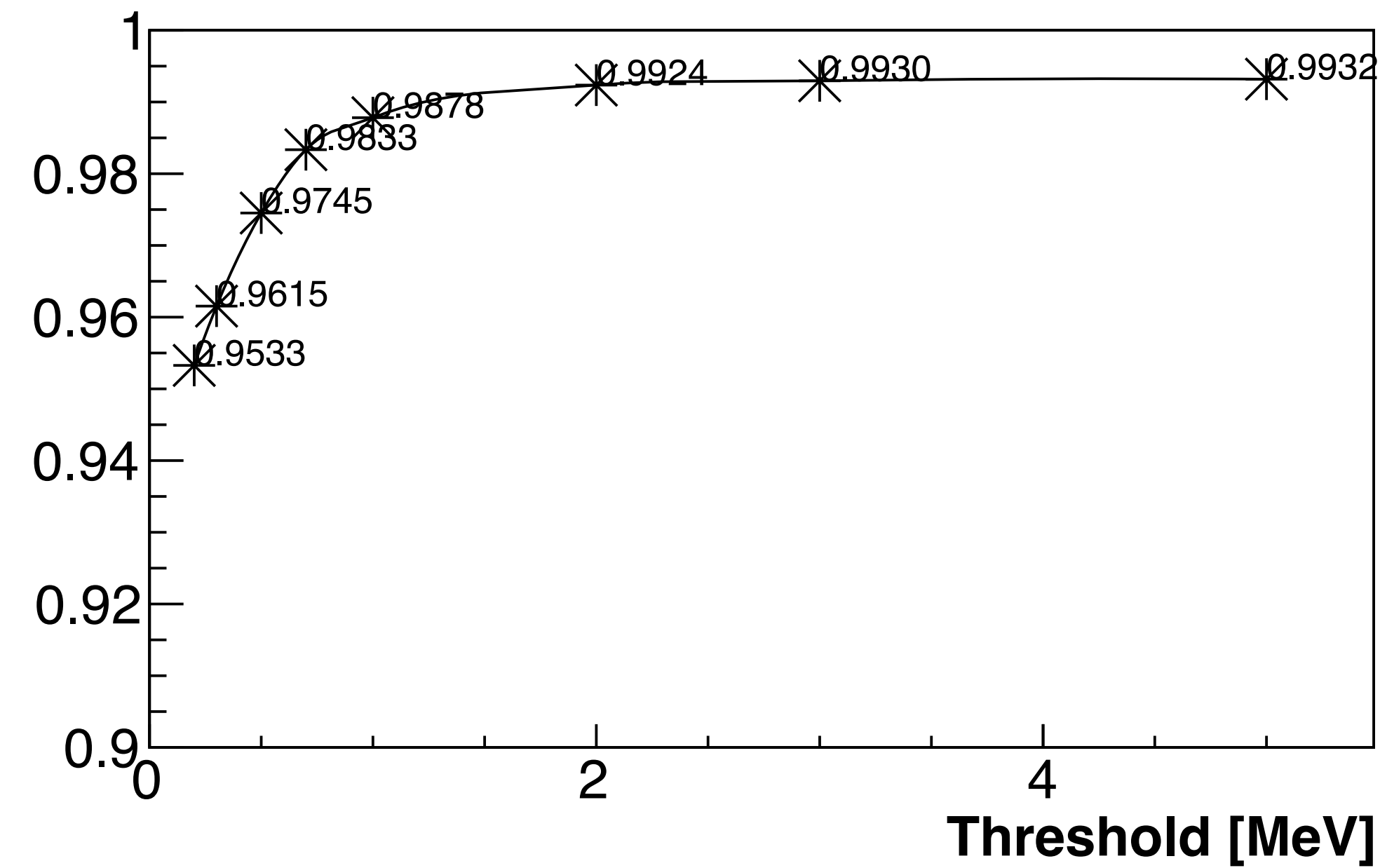
Threshold  
Depende  
nce  
of  
Efficiency  
&  
Signal  
Ratio

**PREVIOUS**  
(original algorithm)

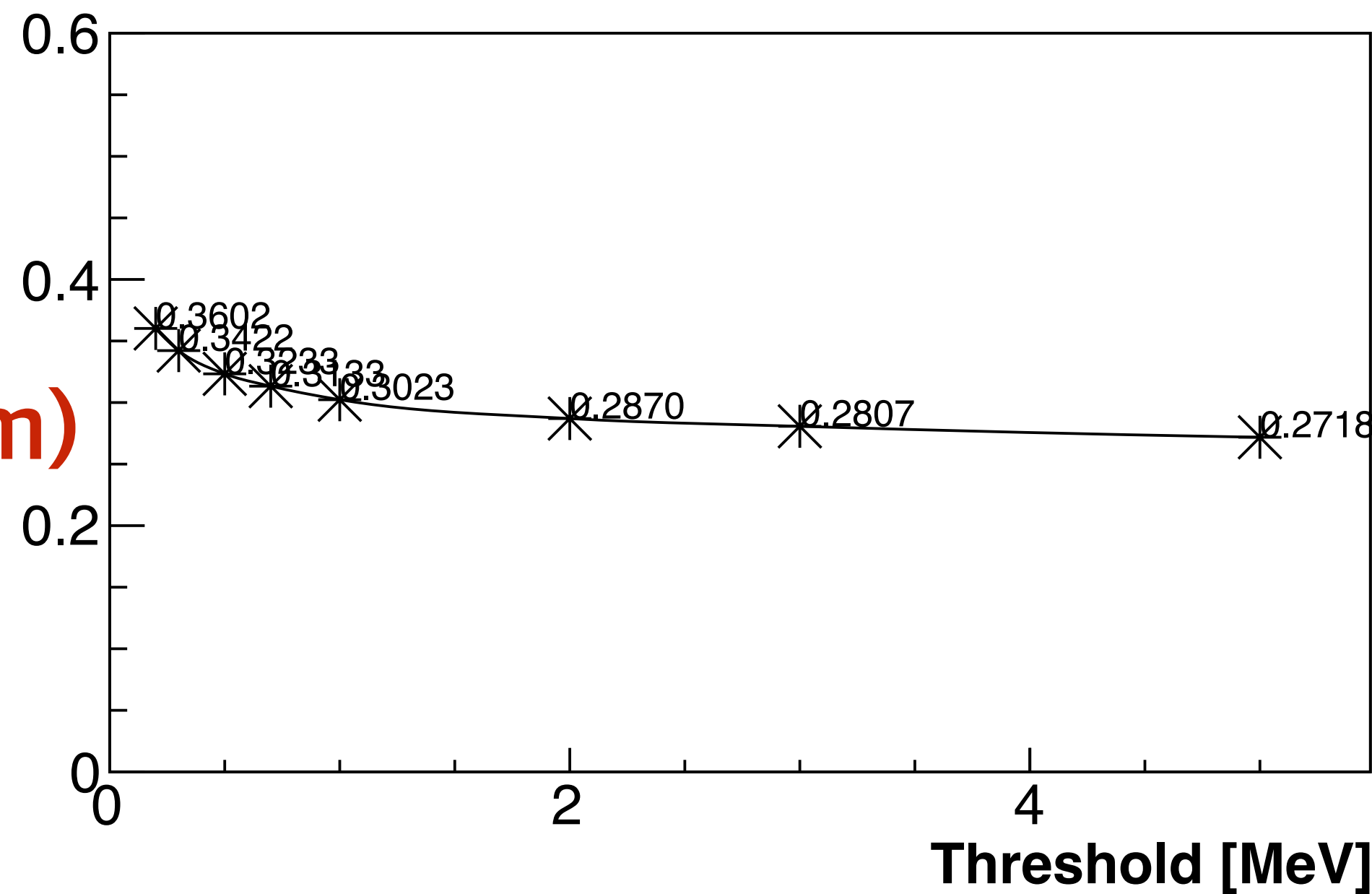
Eff. Thres. Dep. (825/Top)



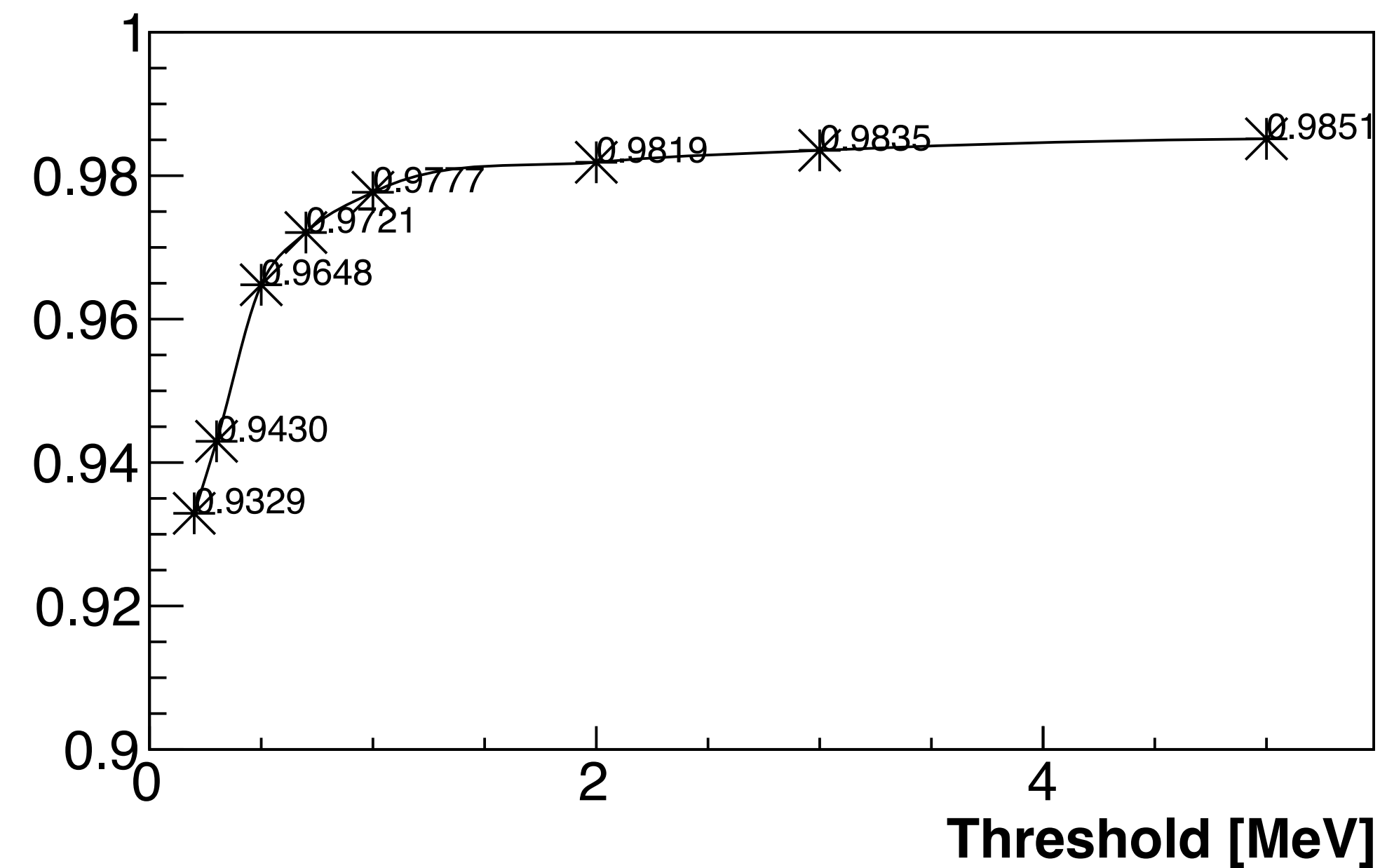
S/N Thres. Dep. (825/Top)



Eff. Thres. Dep. (825/Bot)

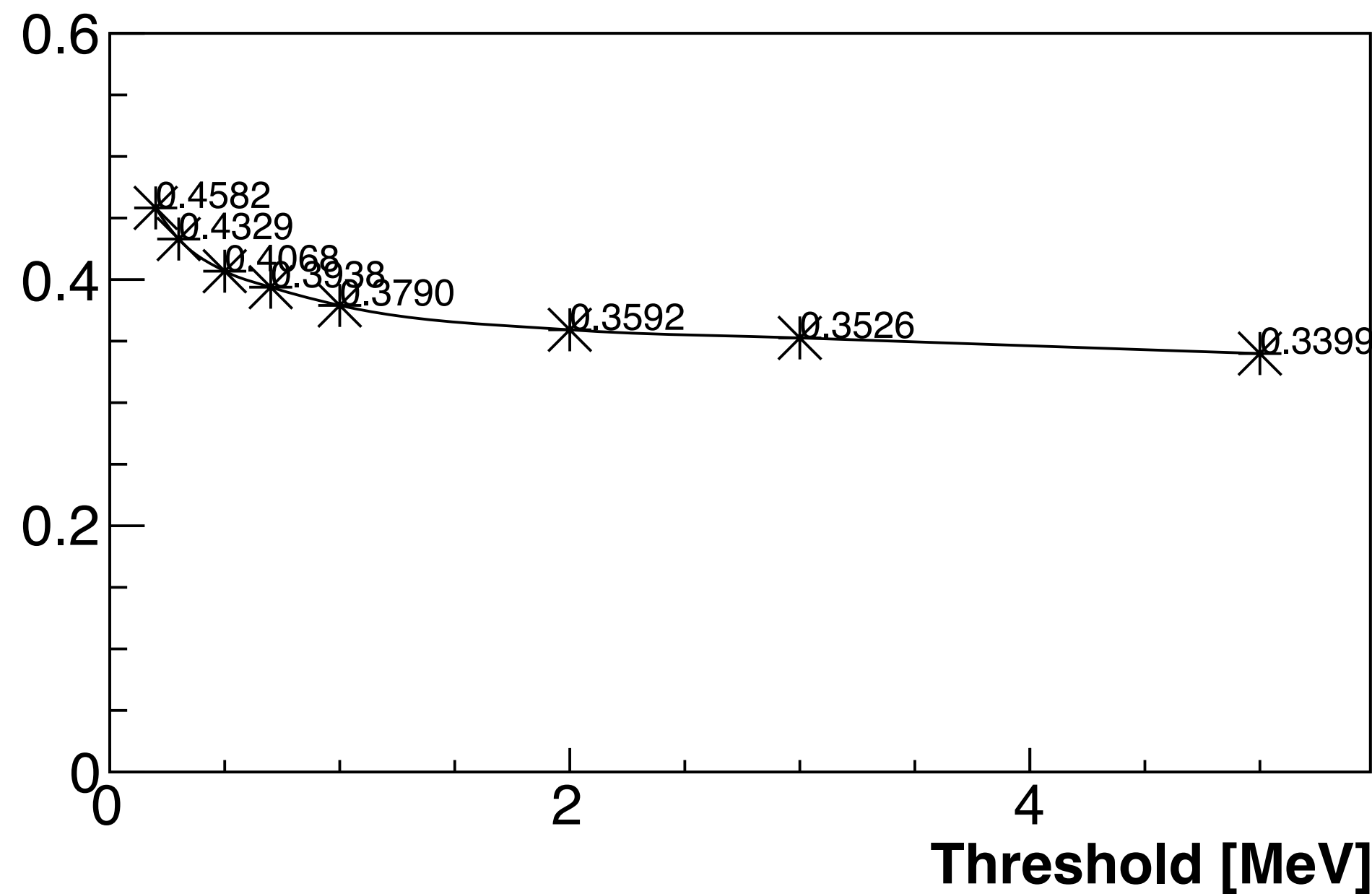


S/N Thres. Dep. (825/Bot)

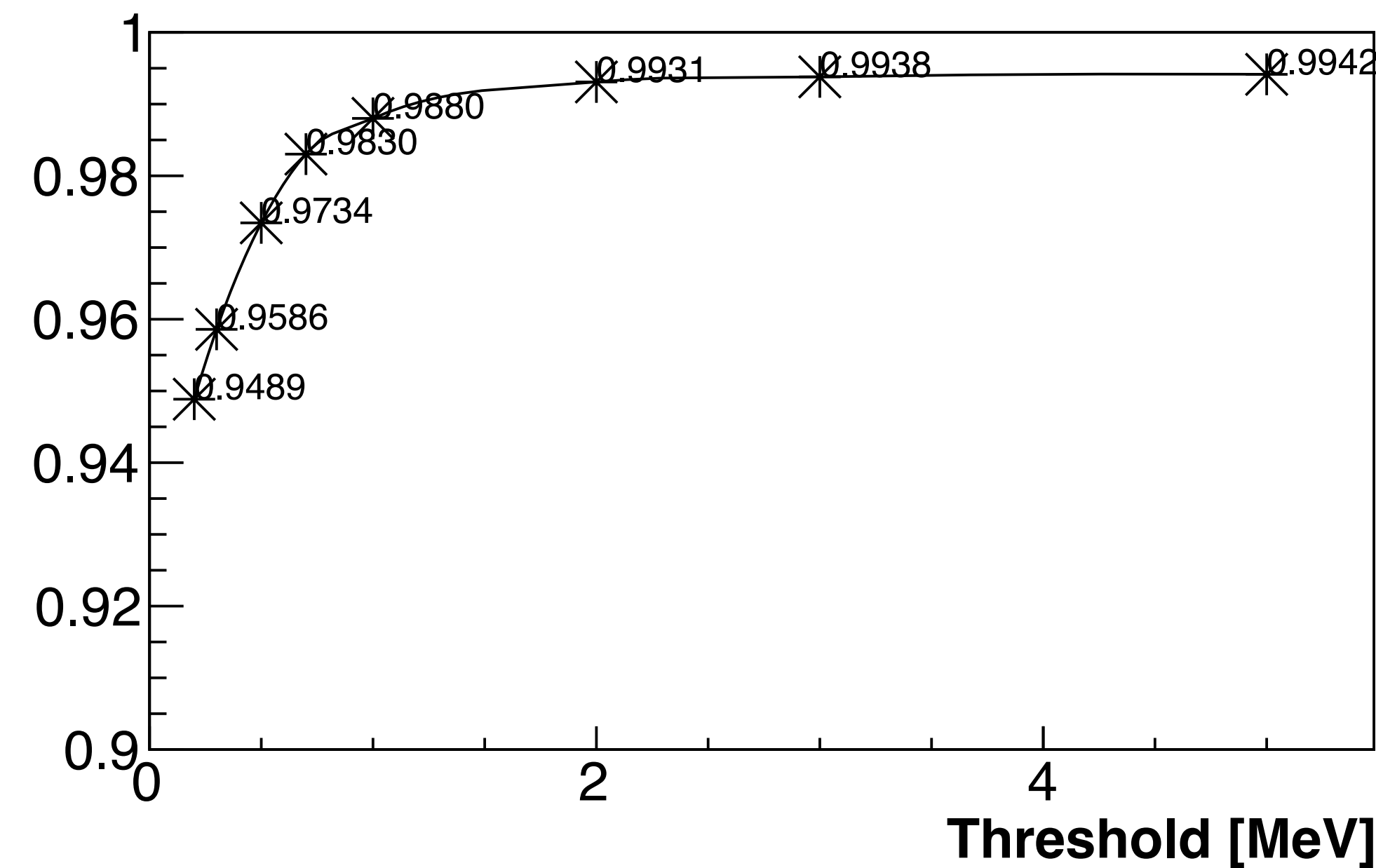


Threshold  
Depende  
nce  
of  
Efficiency  
&

Eff. Thres. Dep. (825/Top)

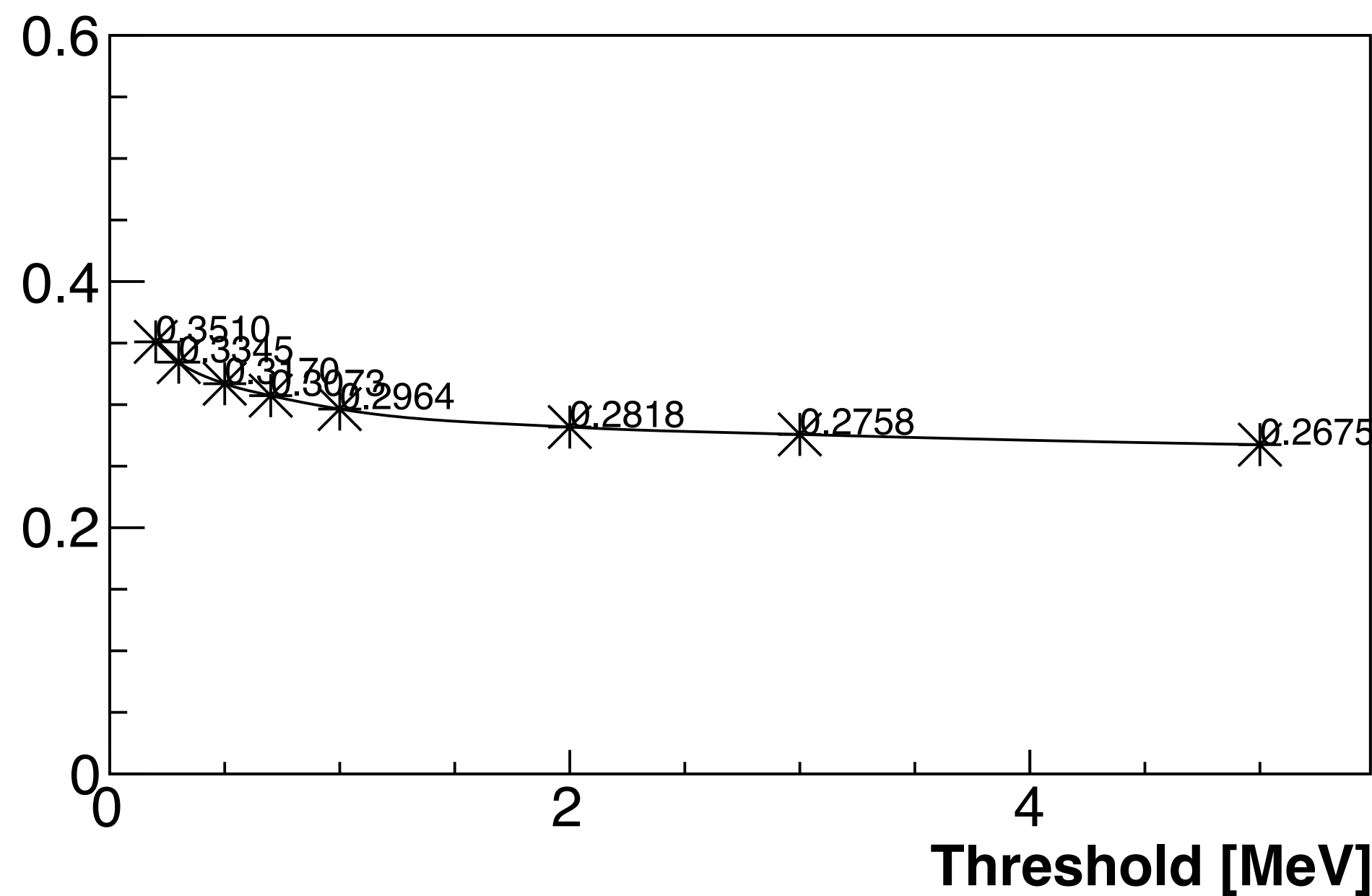


S/N Thres. Dep. (825/Top)

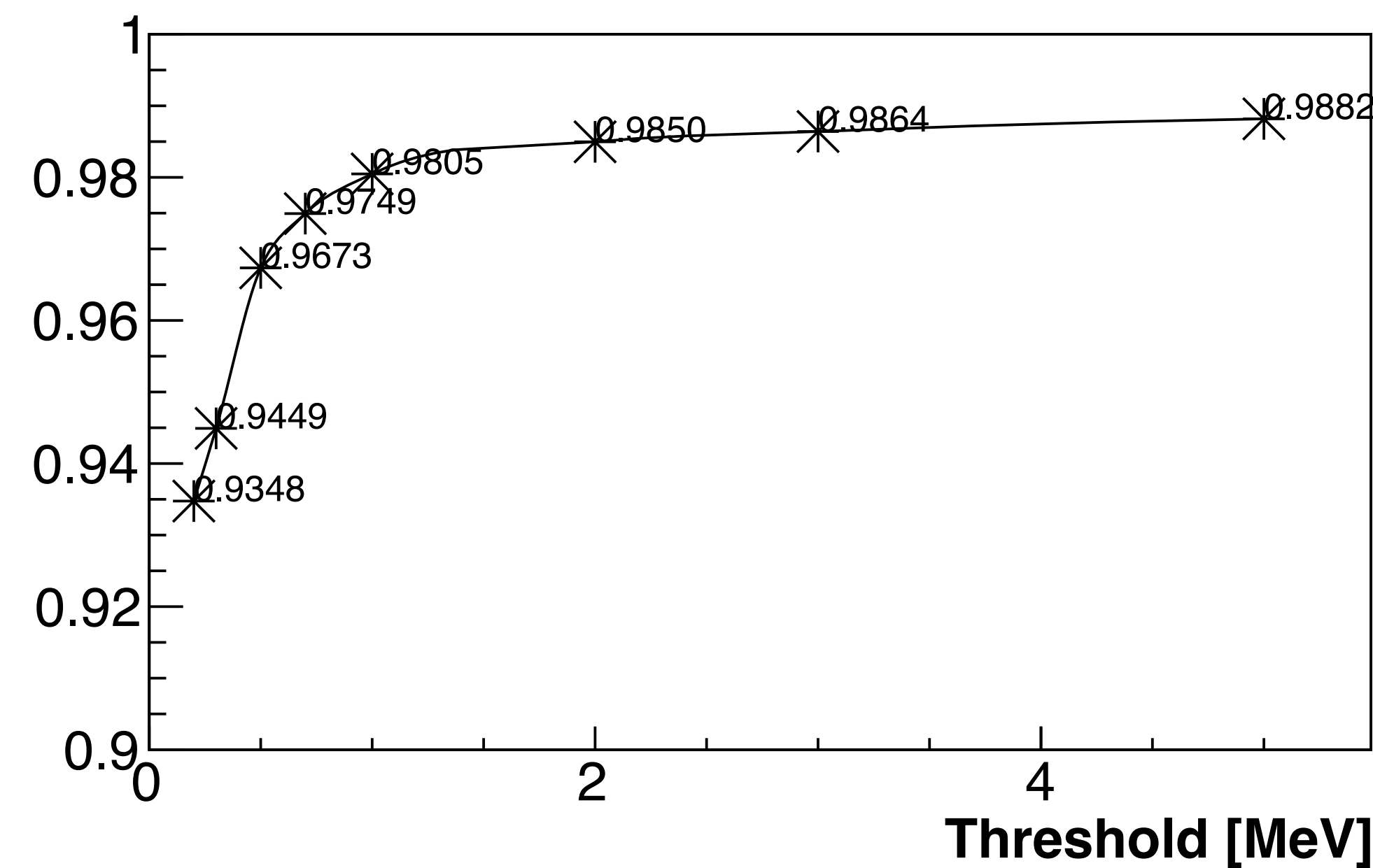


Signal  
Ratio  
  
**New  
(2nd algorithm)**

Eff. Thres. Dep. (825/Bot)

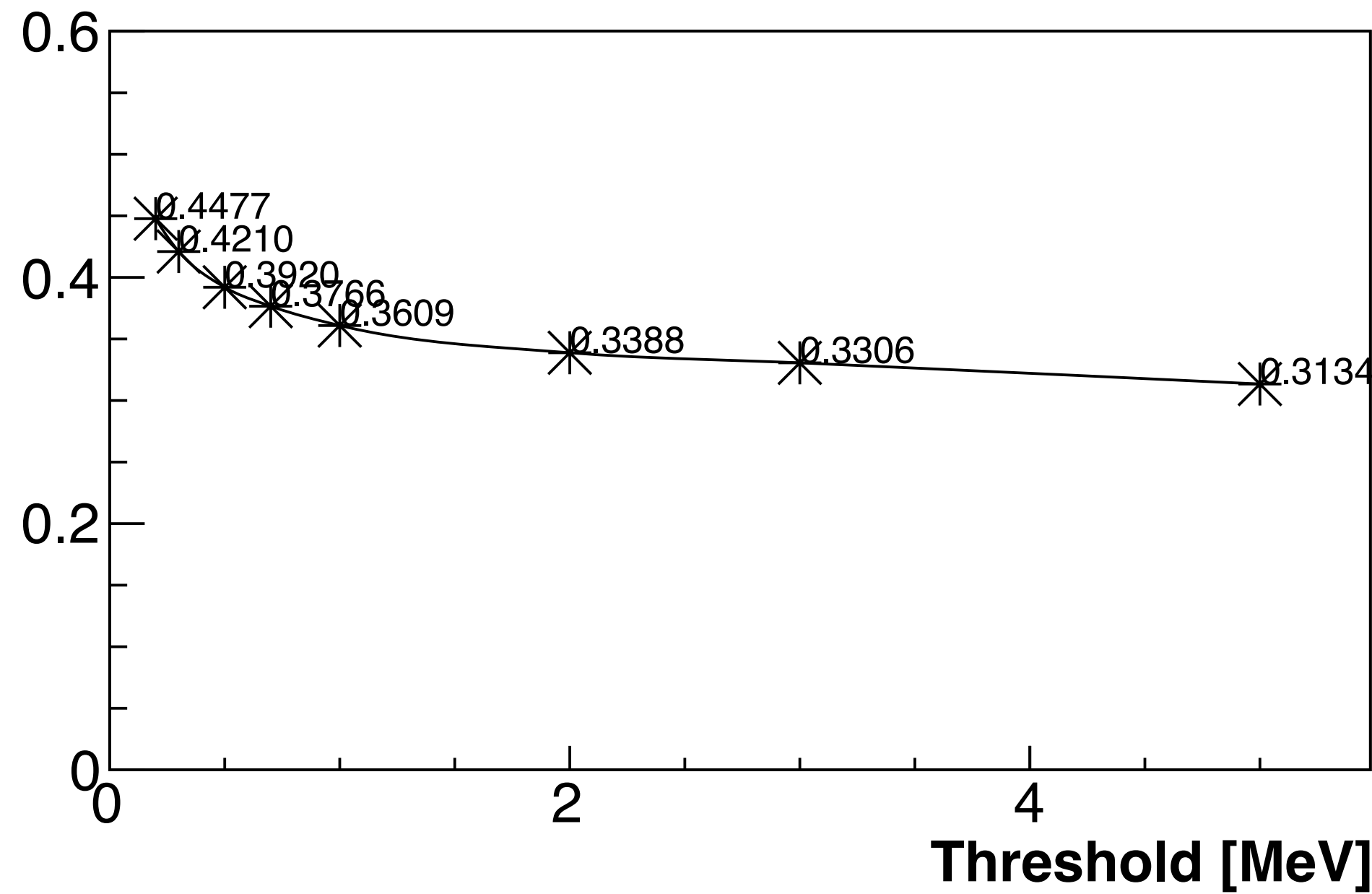


S/N Thres. Dep. (825/Bot)

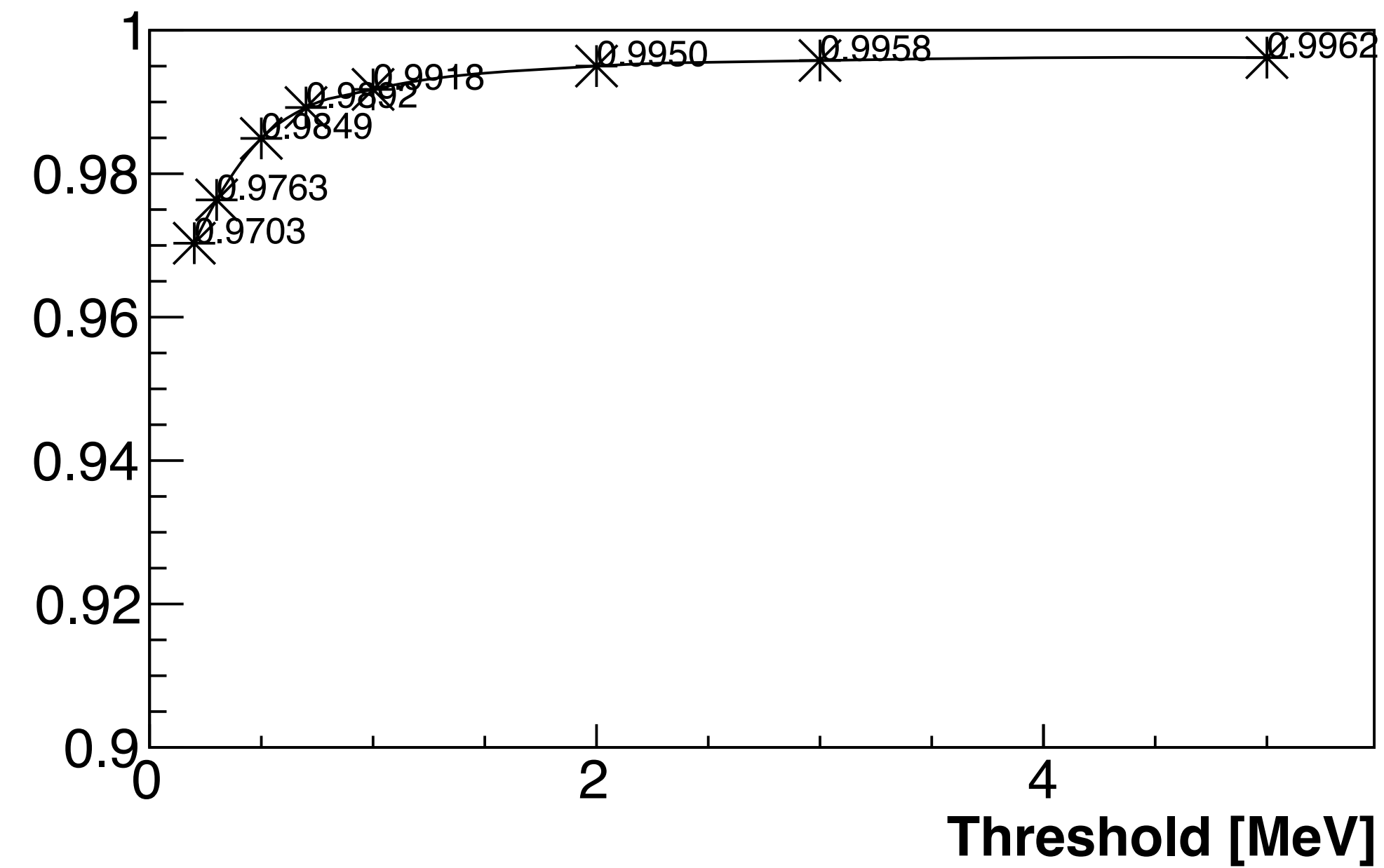


Threshold  
Depende  
nce  
of  
Efficiency  
&  
Signal  
Ratio  
  
**New  
(3rd algorithm)**

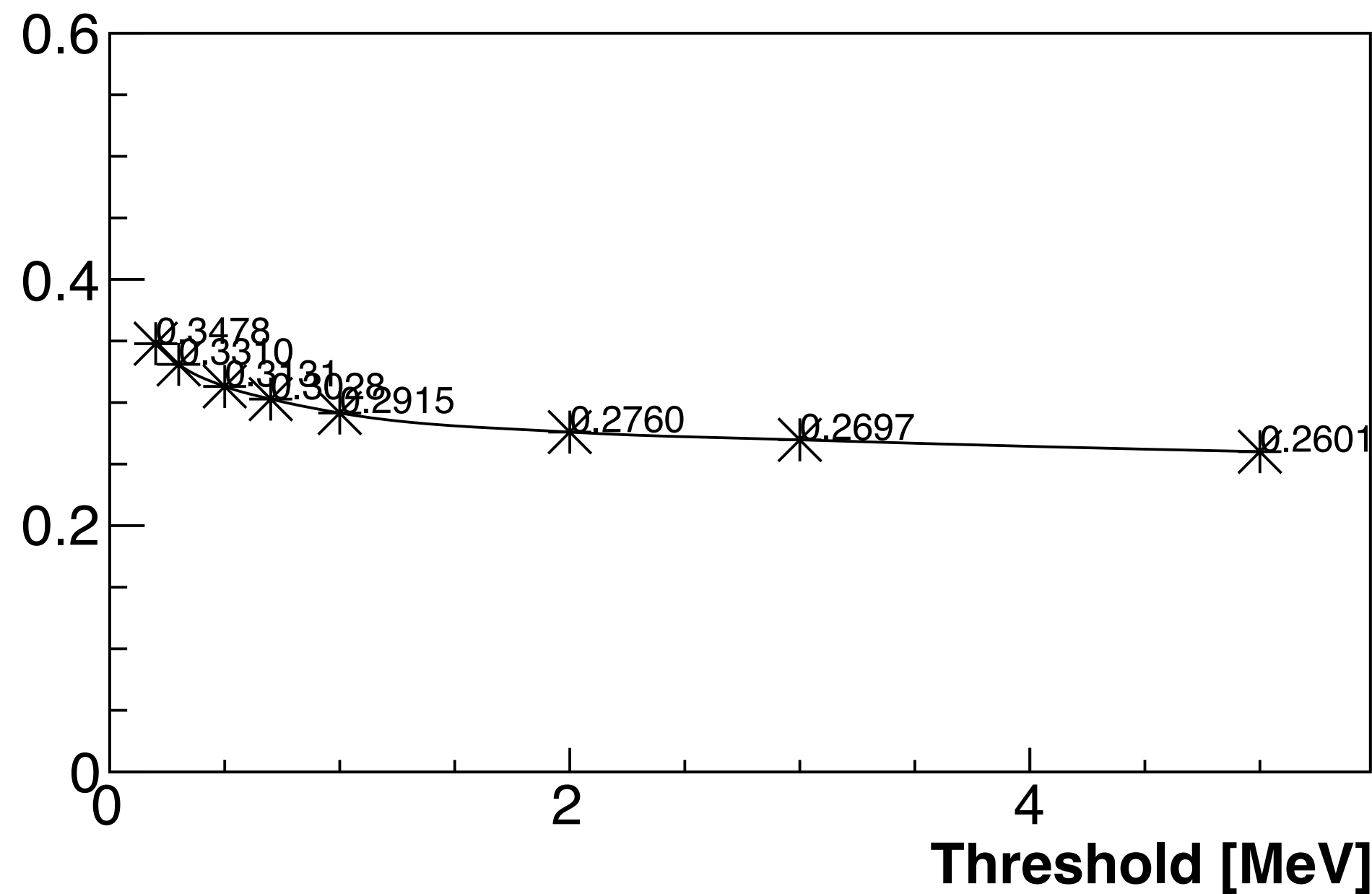
**Eff. Thres. Dep. (825/Top)**



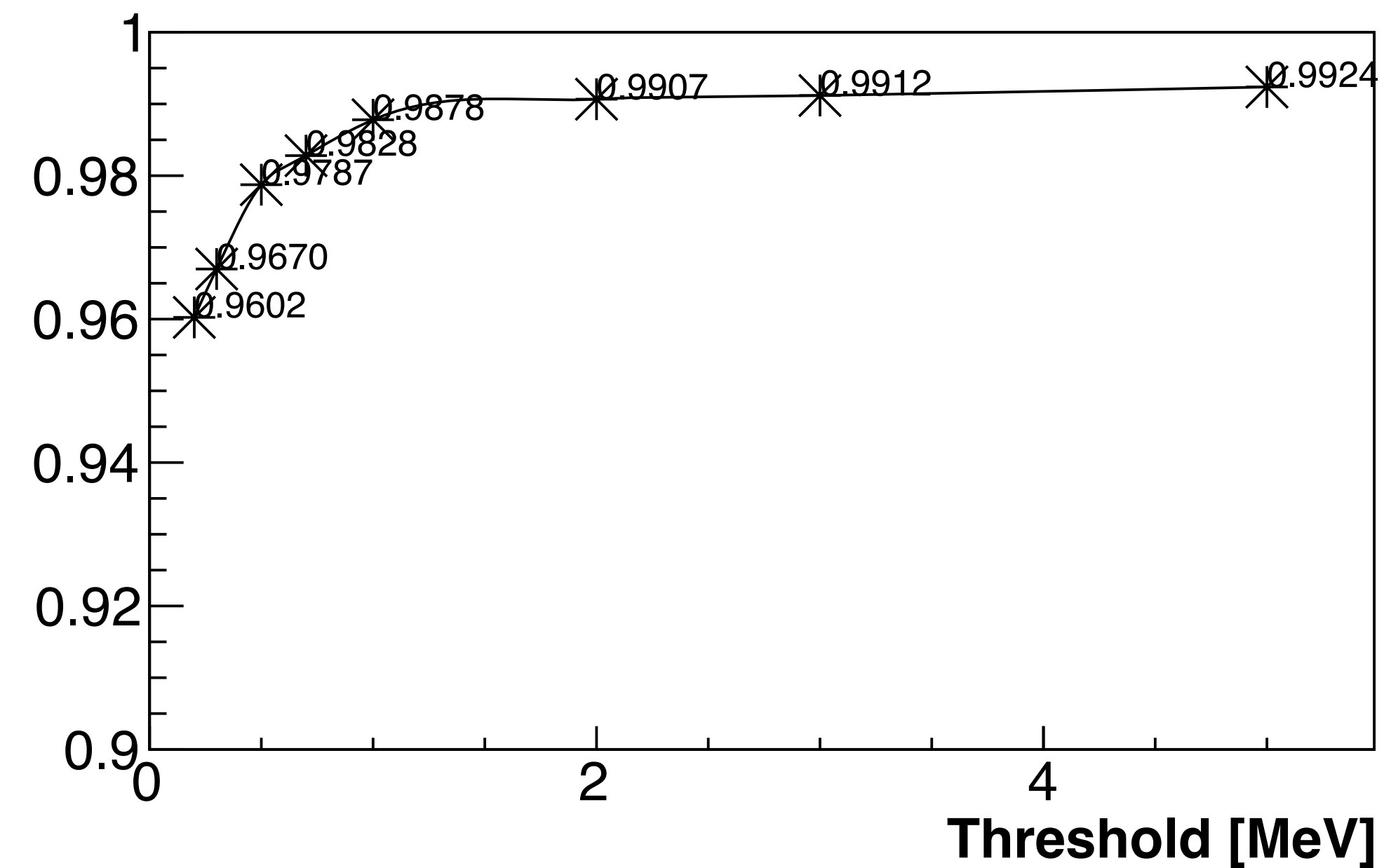
**S/N Thres. Dep. (825/Top)**



**Eff. Thres. Dep. (825/Bot)**



**S/N Thres. Dep. (825/Bot)**



# Simulation: Another algorithm

## Rejection Efficiency

| Threshold     | 0.3 MeV | 2 MeV  | 5 MeV  |
|---------------|---------|--------|--------|
| 1st Algorithm | 0.4850  | 0.3895 | 0.3643 |
|               | 0.3422  | 0.2870 | 0.2718 |
| 2nd Algorithm | 0.4329  | 0.3592 | 0.3399 |
|               | 0.3345  | 0.2818 | 0.2675 |
| 3rd Algorithm | 0.4210  | 0.3388 | 0.3134 |
|               | 0.3310  | 0.2760 | 0.2601 |

$$\begin{aligned} (\text{Rej. Eff.}) = \\ (\# \text{ of ONE Trigger Selected}) / \\ (\# \text{ of Total}) \end{aligned}$$

## Rejection Accuracy

| Threshold     | 0.3 MeV | 2 MeV  | 5 MeV  |
|---------------|---------|--------|--------|
| 1st Algorithm | 0.9615  | 0.9924 | 0.9932 |
|               | 0.9430  | 0.9819 | 0.9851 |
| 2nd Algorithm | 0.9586  | 0.9931 | 0.9942 |
|               | 0.9449  | 0.9850 | 0.9882 |
| 3rd Algorithm | 0.9763  | 0.9950 | 0.9962 |
|               | 0.9670  | 0.9907 | 0.9924 |

$$\begin{aligned} (\text{Rej. Acc.}) = \\ (\# \text{ of Real Trigger Selected}) / \\ (\# \text{ of ONE Trigger Selected}) \end{aligned}$$