

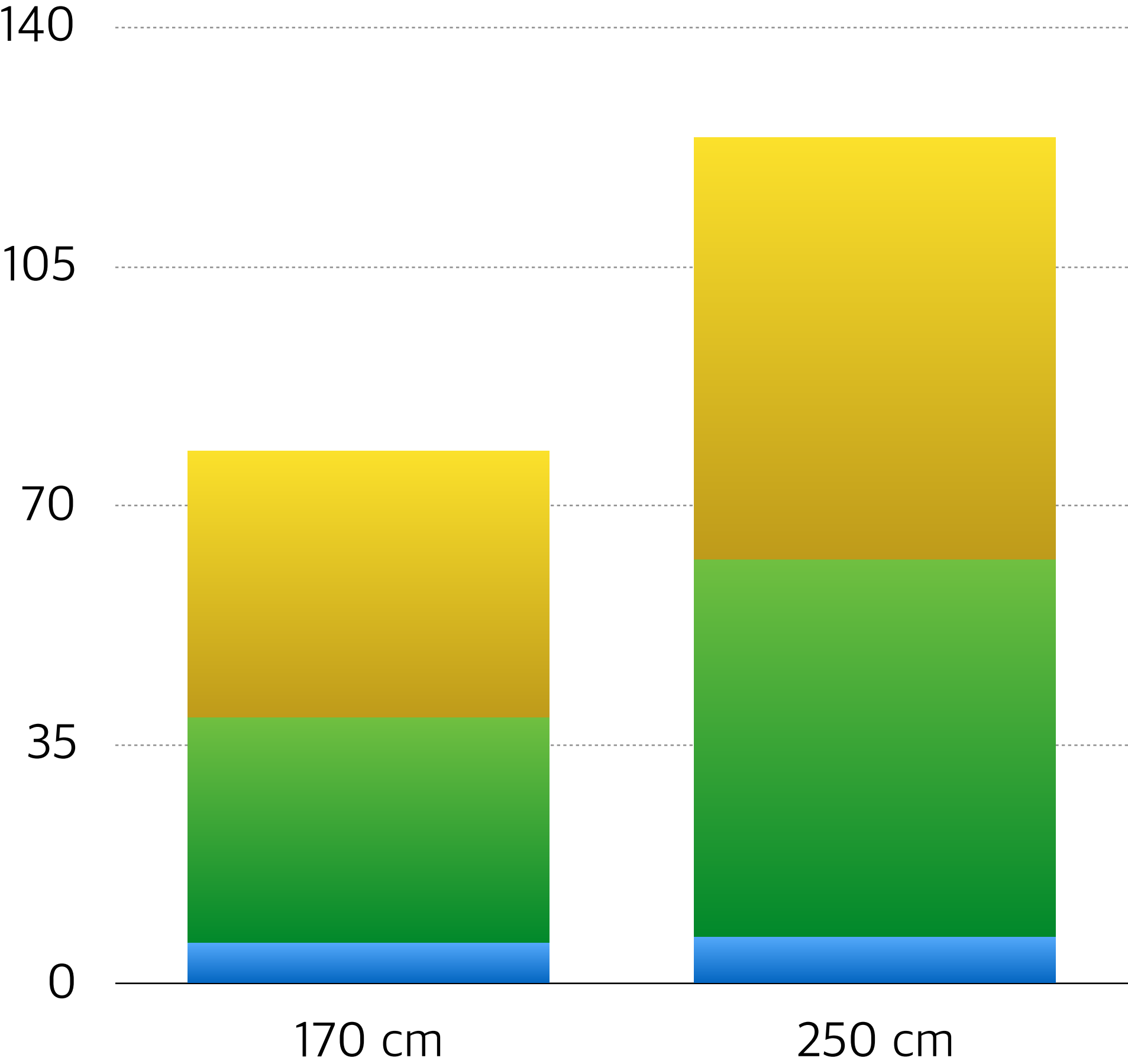
Status report (28 Nov. 2016)

Jongwon Hwang

Simulation: Cosmic muon check

- Change of Detected Cosmic-ray with Different Top-Bottom bar length (170 cm / 250 cm)
- Change of Height of Produced Cosmic-ray (1m / 2m)
- Accidental Two or More Cosmic-rays Detected

Cosmic-ray: Different TB Length



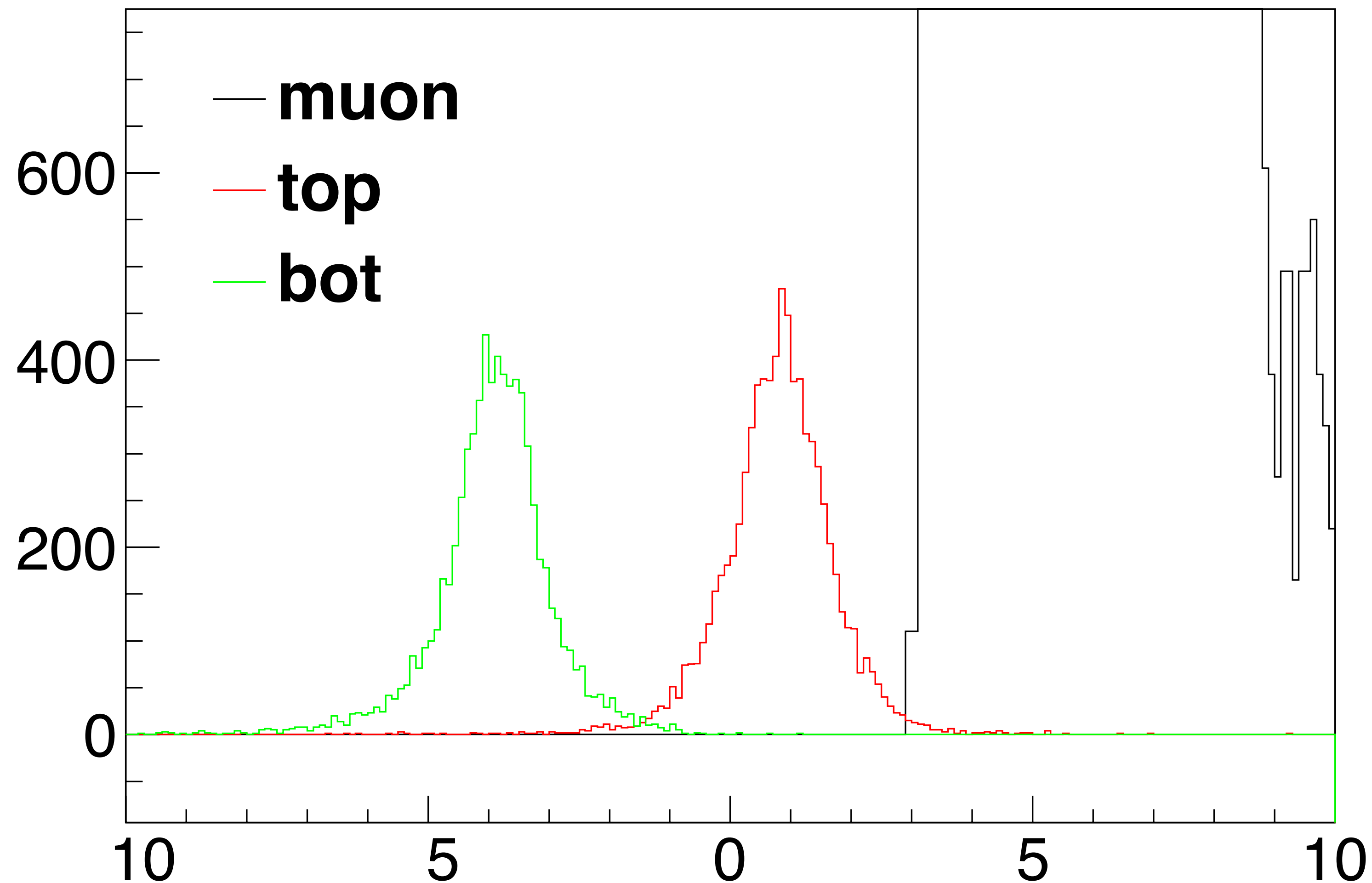
	2 Layer Hits (T-B)	3 Layer Hits (T-B-?)	Sum
170 cm	6	33	39
250 cm	7	55	62
	+16%	+33%	+59%

+40-cm raised Top Det.

Cosmic-ray: Different Produced Height

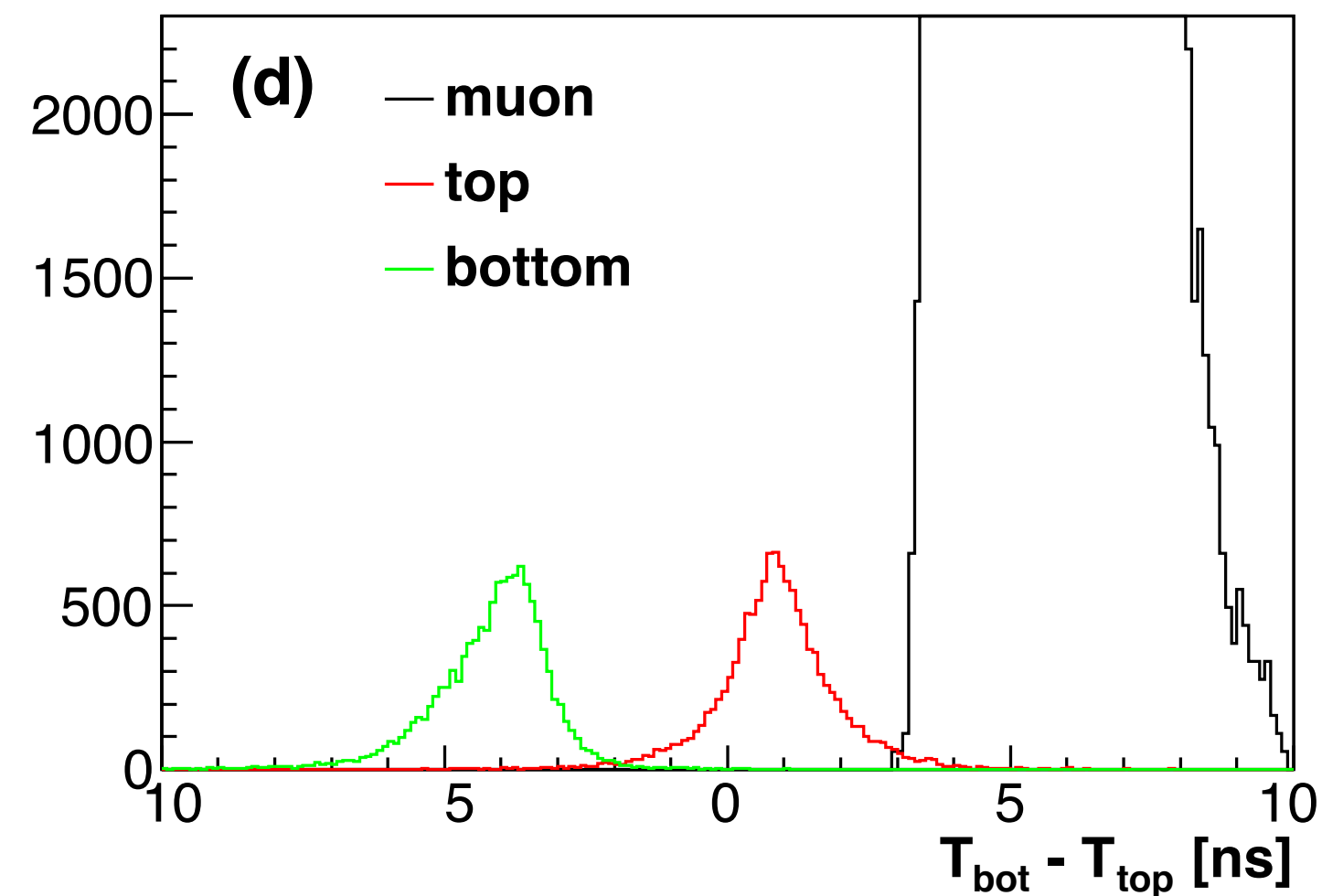
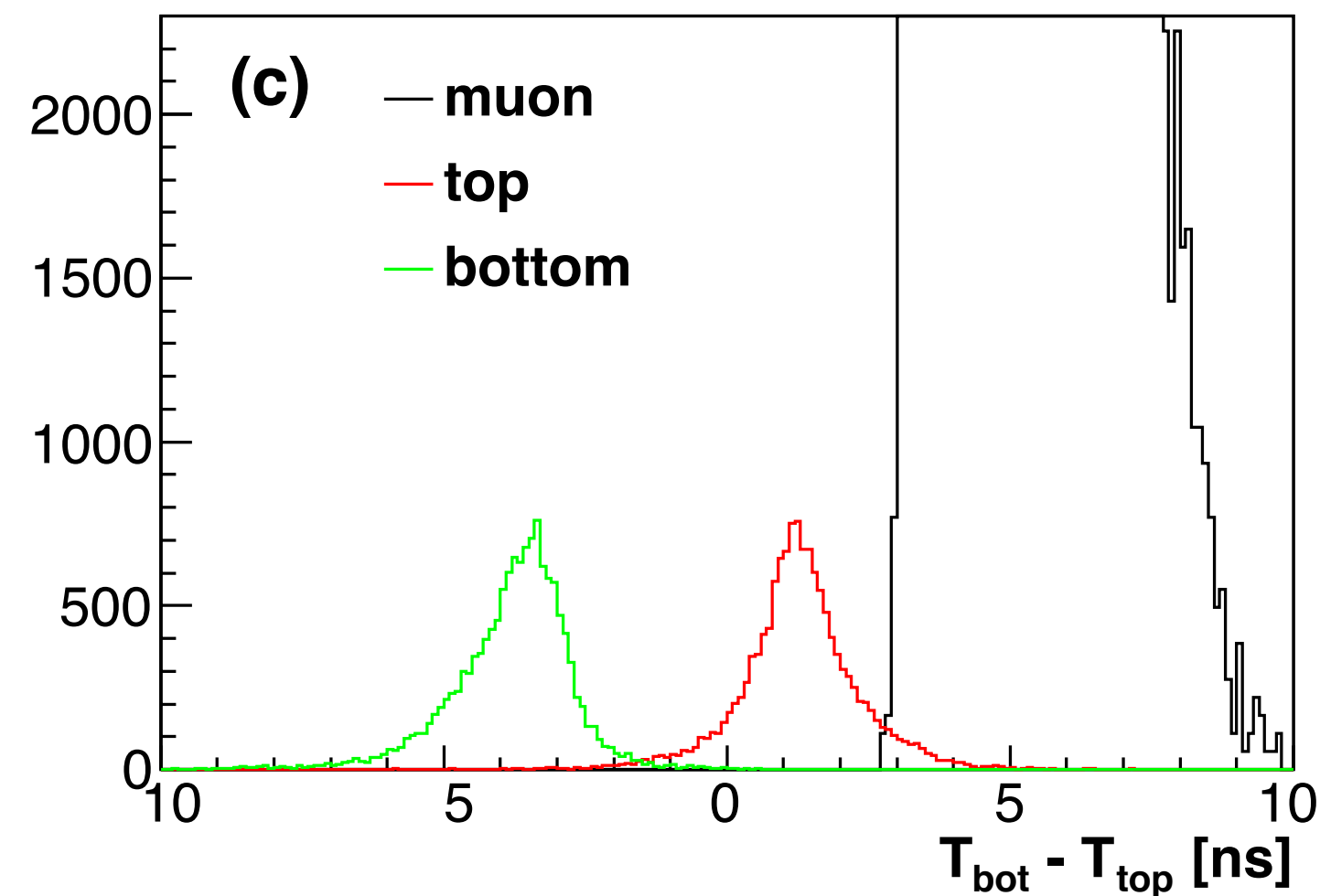
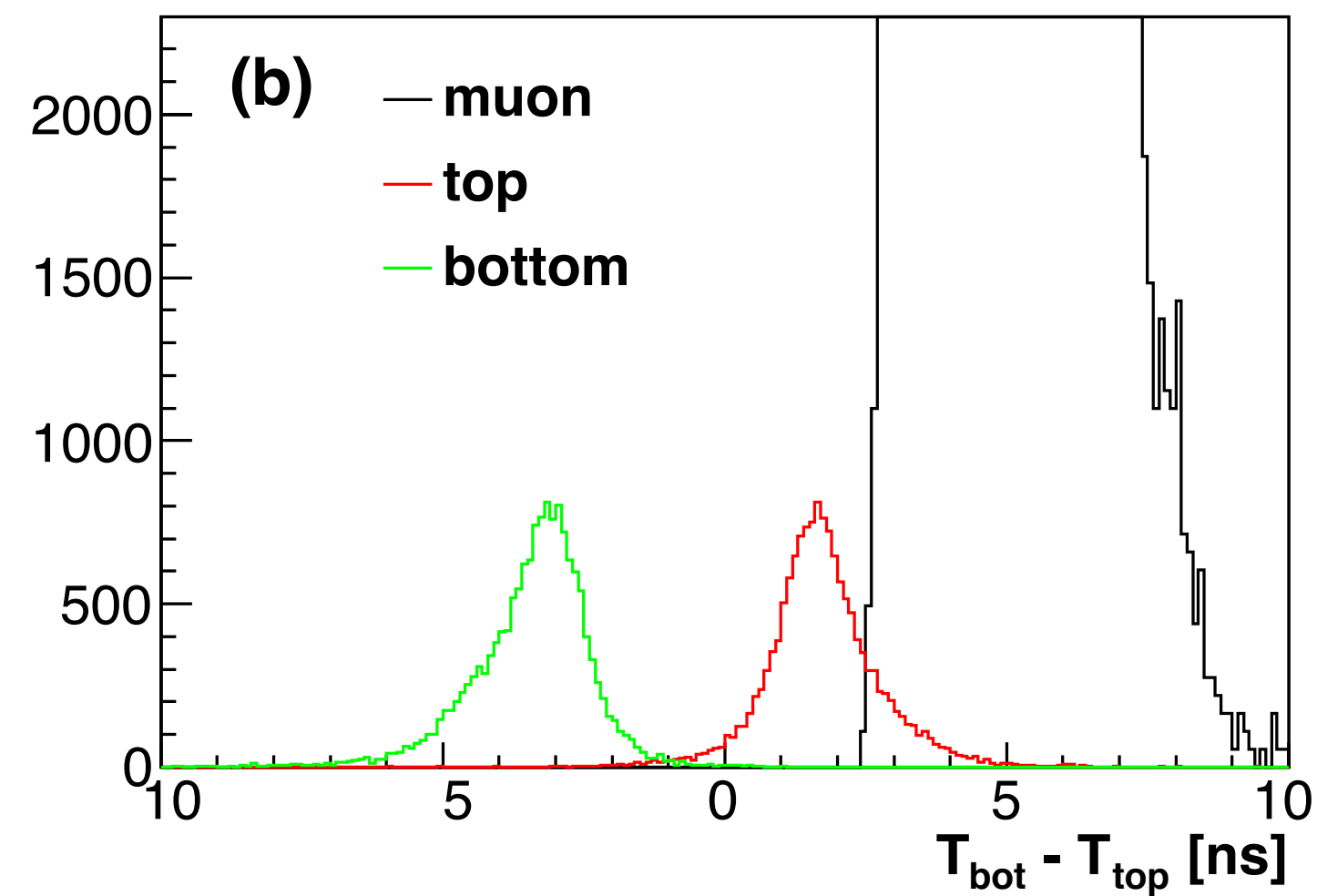
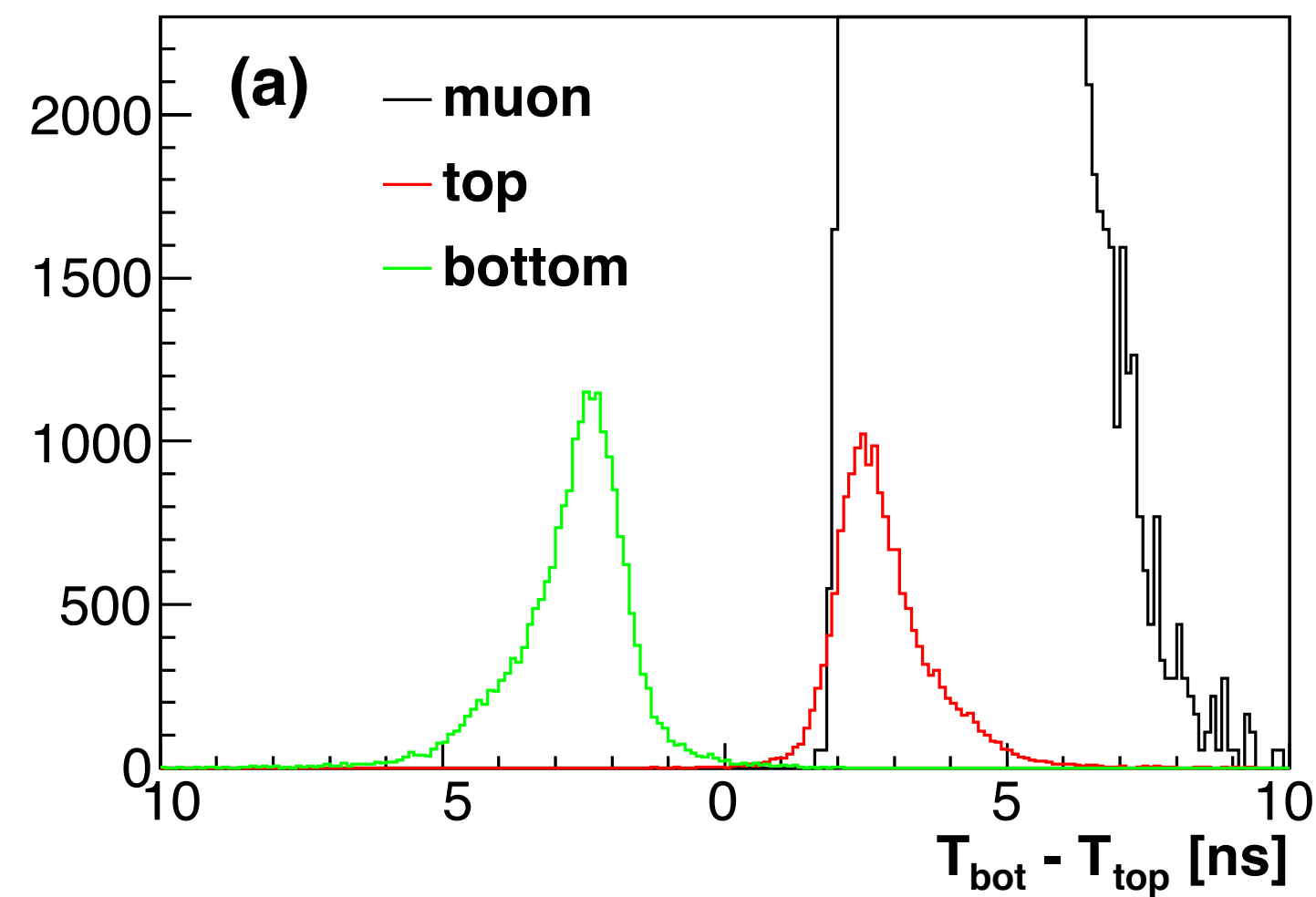
botT[0] - topT[0]

Previous (TB 170 cm)



- 10^6 anti-proton
- 10^8 cosmic-rays & x 55 scaling
(~ 5,500 cosmic-ray generated in $10 \times 10 \text{ m}^2$ during 500 ms)
- all events with Top and Bottom hits
- $dT = T_{\text{bot}} - T_{\text{top}}$
(with the fastest hit)

Cosmic-ray: Different Produced Height



- (a) 0-cm raised
- (b) 20-cm raised
- (c) 30-cm raised
- (d) 40-cm raised

Cosmic-ray: Different TB Length

- +40-cm raised Top Detector
- Normalized to 500 ms

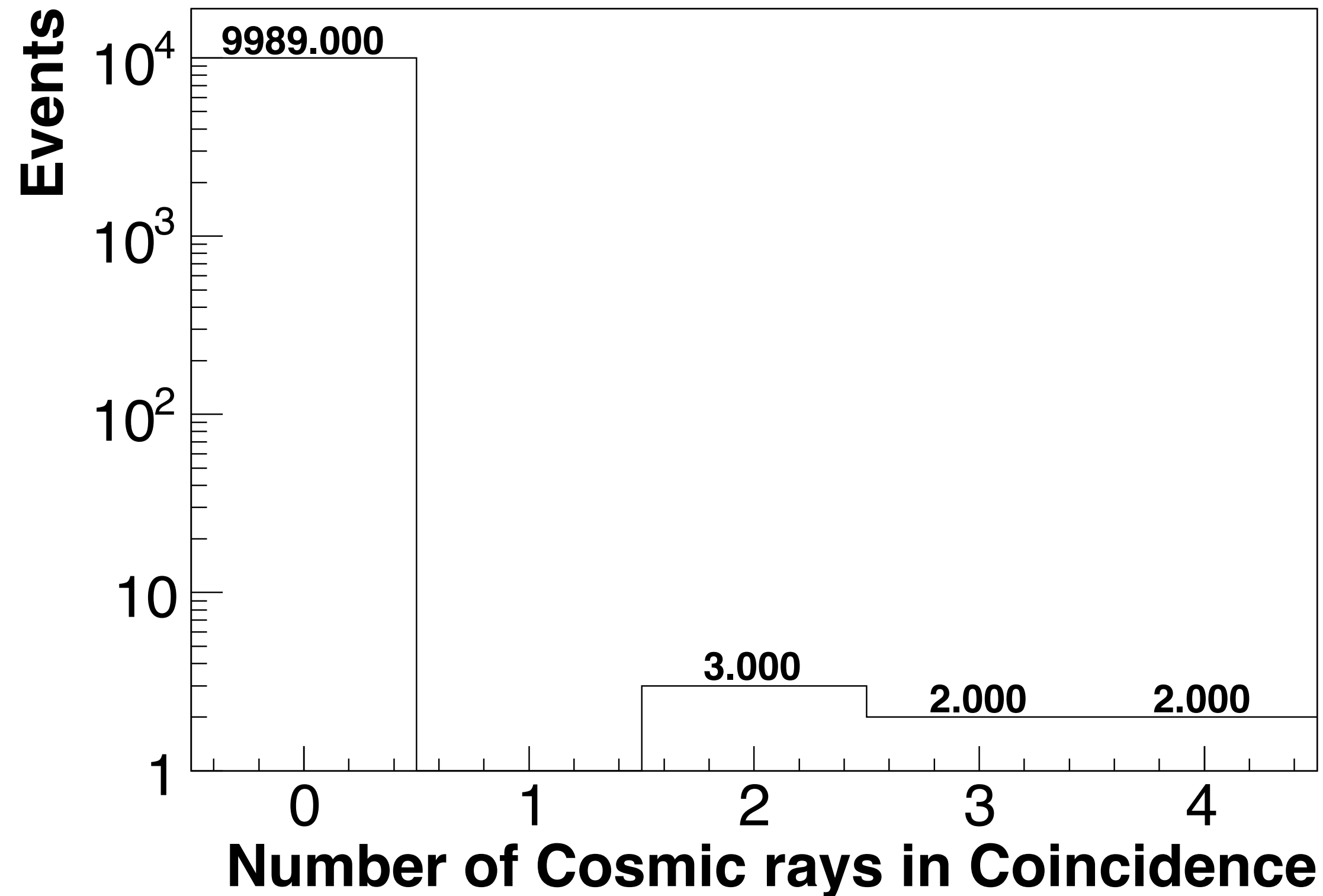
	at least 1 Hit	2 Layer Hits (T-B)	3 Layer Hits (T-B-?)
1 m Height (Original)	247	55.235	6.910
2 m Height	240	55.494	6.925

No Difference.

Cosmic-ray: Accidental Two Hits

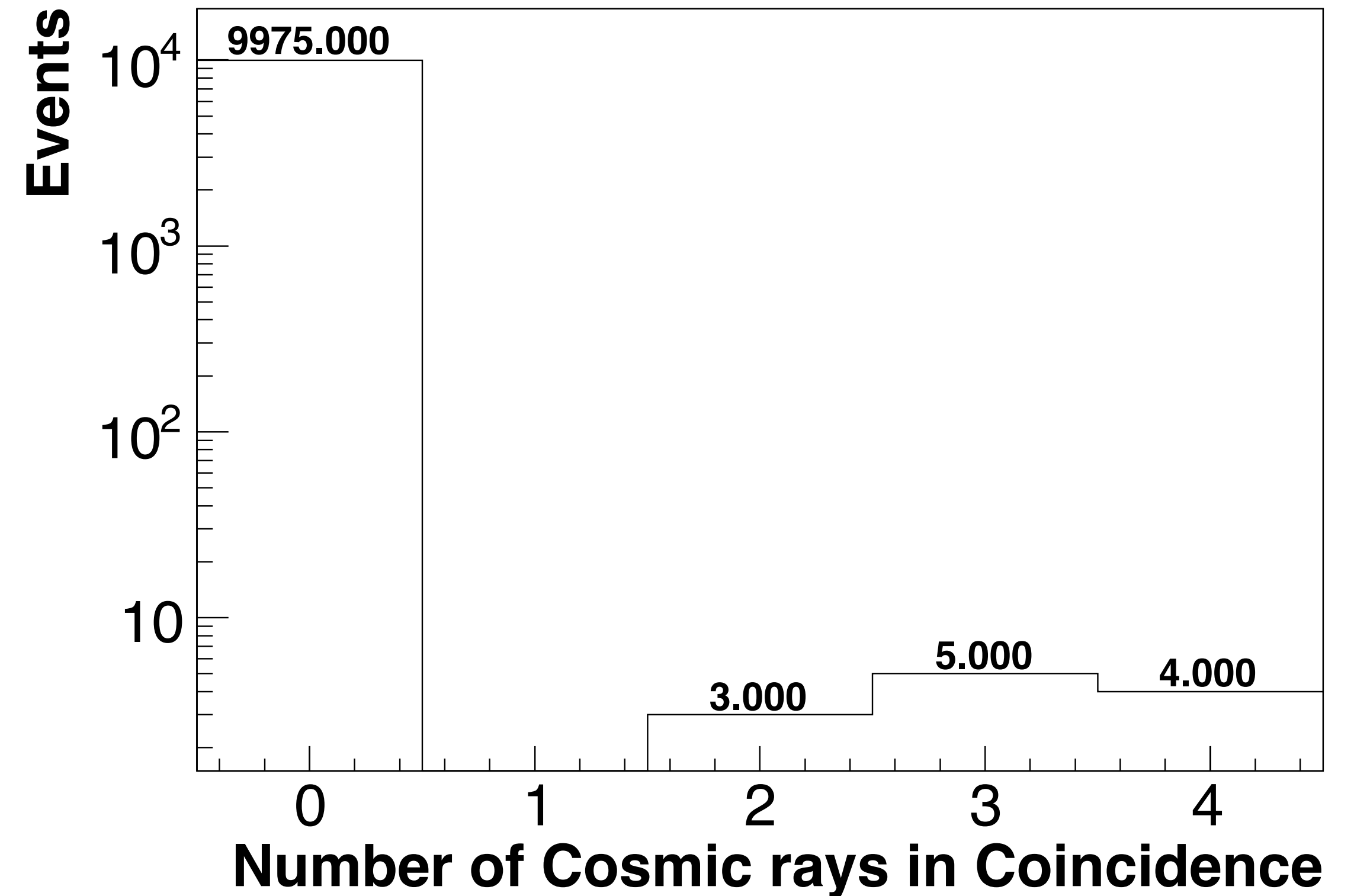
- Modified Simulation
 - Accumulate produced cosmic-rays for 500 ms.
 - “One event” contains all cosmic-rays during the time window.
- Definition of accidental coincidence
 - Distance of T-B detector: $825 \text{ mm} + 425 \text{ mm} = 1250 \text{ mm}$
 - Time window for Cosmic-ray (beta ~ 1):
 $\sim 5 \text{ ns}$ (calculation) / $\sim 10 \text{ ns}$ (simulation)
 - Time window for anti-H signal: $\sim 5 \text{ ns}$

Cosmic-ray: Accidental Two Hits



10-ns Coincidence Window

11 events / 10,000 events



20-ns Coincidence Window

25 events / 10,000 events