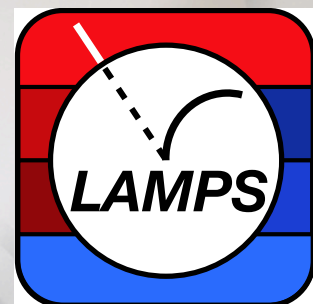


# START COUNTER 2021년 계획

MinJung Kweon  
Inha University

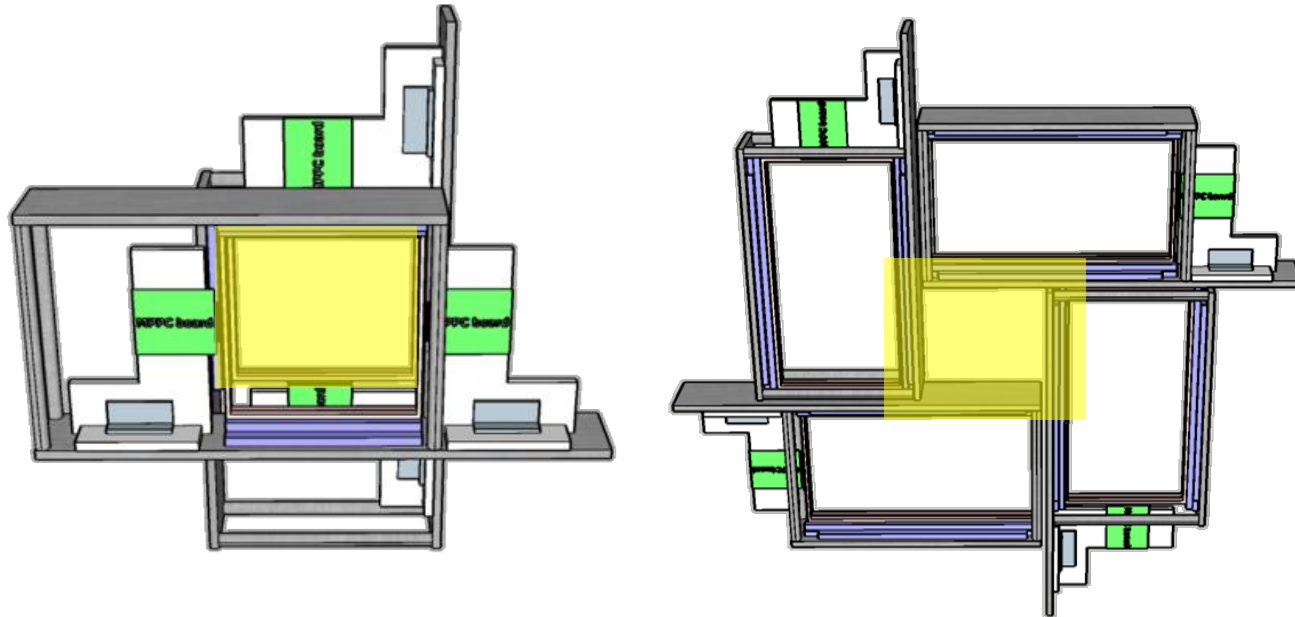
2021. 1. 27





# 2020년 prototype 제작 및 테스트 결과

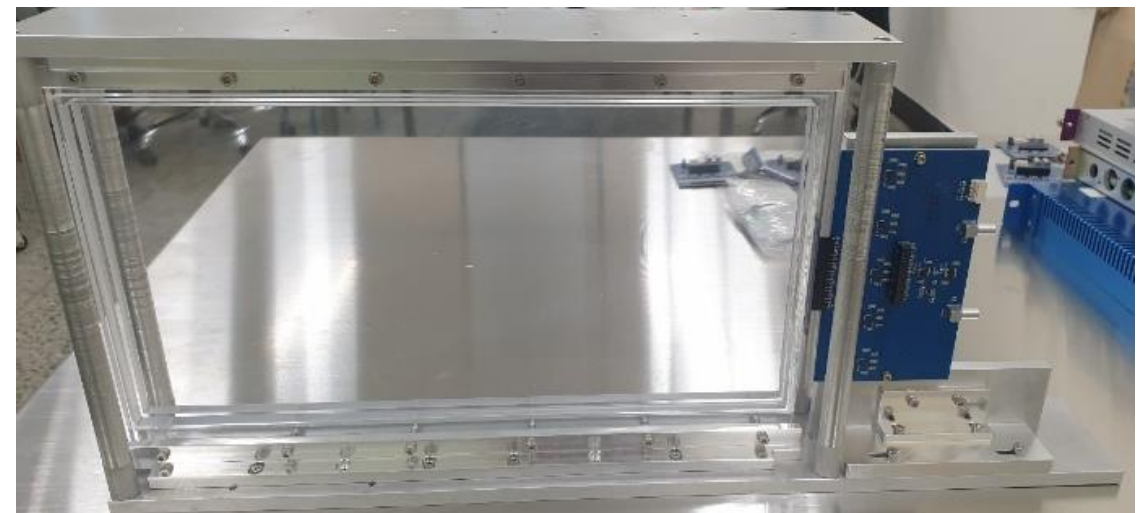
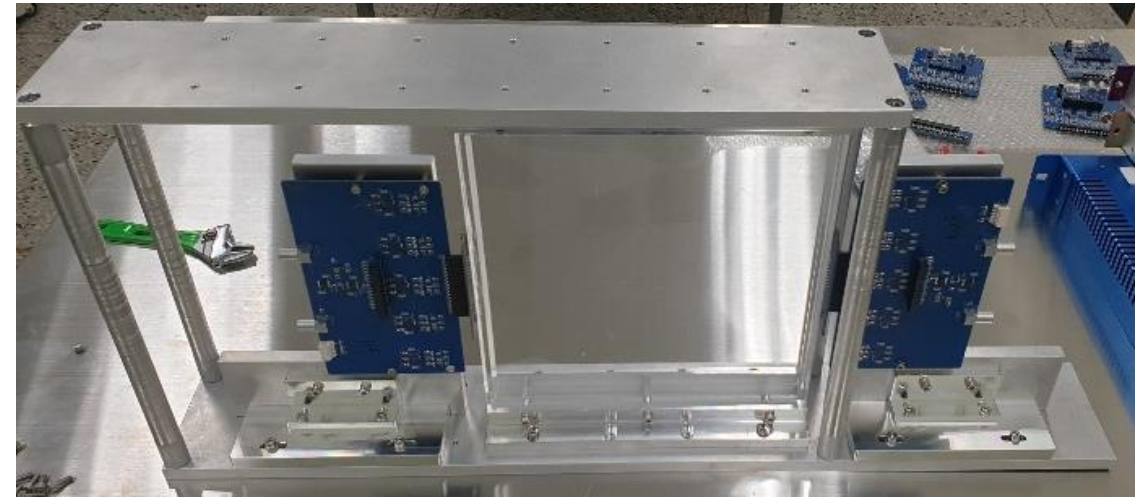
## ❖ Original design of the start counter and prototype



▲ starting counter

▲ veto counter

- starting counter:  $200 \times 200 \times 0.2 \text{ mm}^3$
- veto counter:  $400 \times 200 \times 5 \text{ mm}^3$

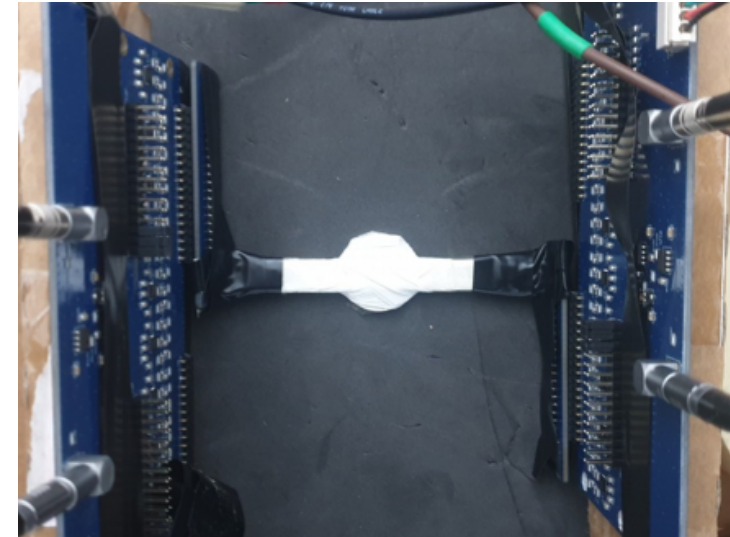
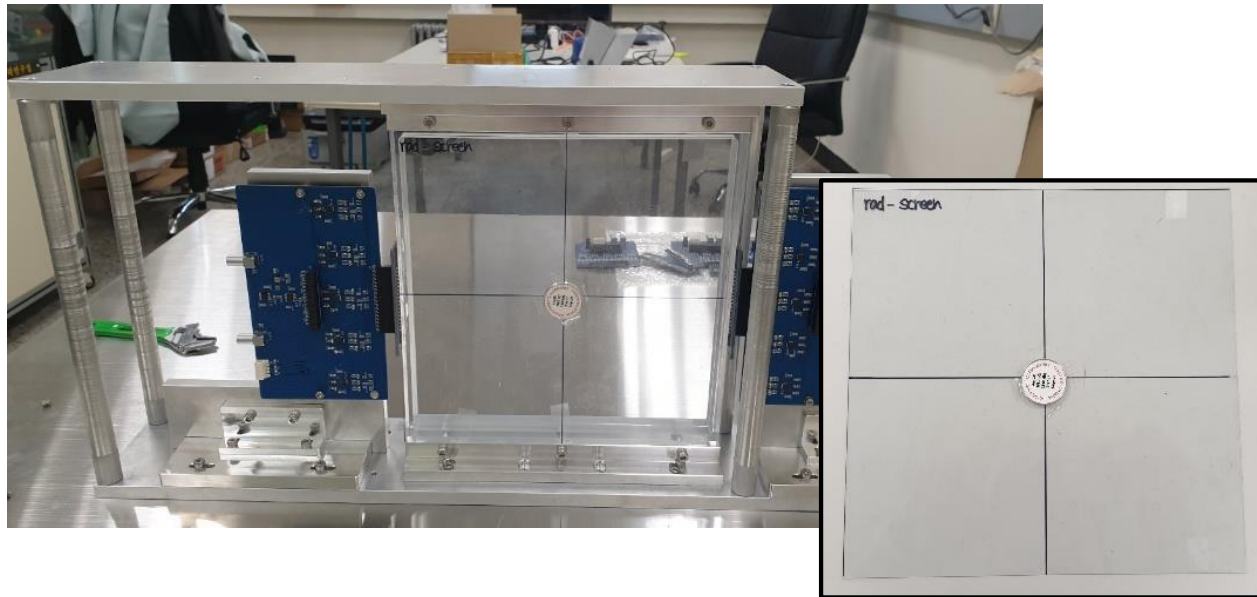


## ❖ Considering the beam size simulated, the size will be reduced:

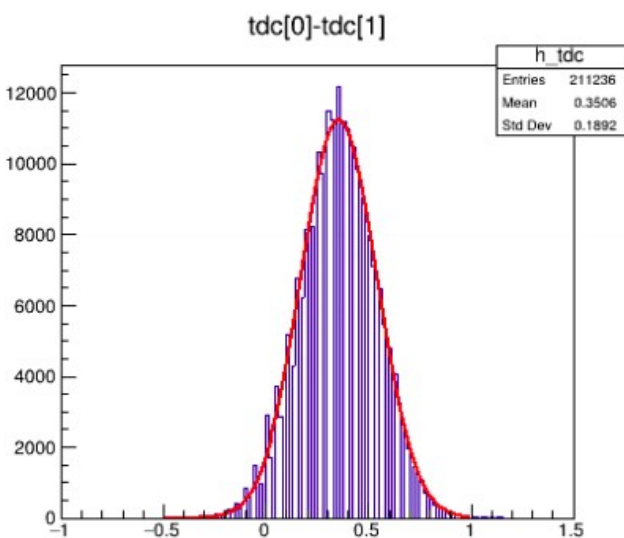
- ▶ SC:  $100 \times 100 \times 0.2 \text{ mm}^3$
- ▶ VC:  $200 \times 100 \times 5 \text{ mm}^3$

# 2020년 prototype 제작 및 테스트 결과

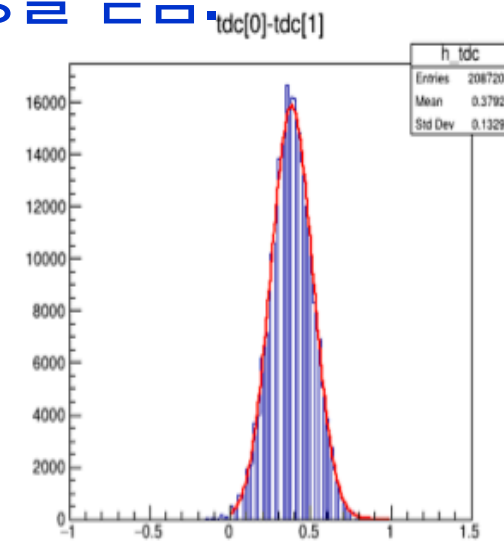
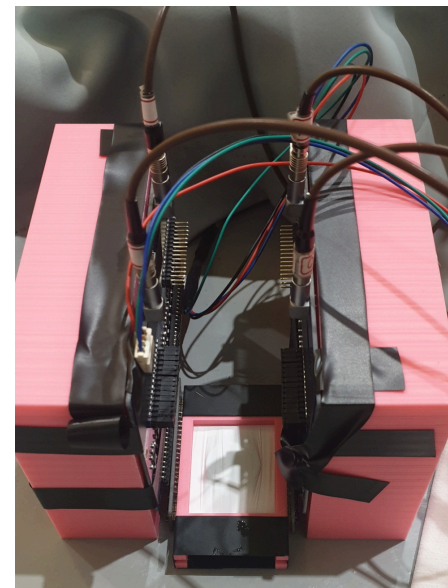
- ❖ Struggled with strange timing distribution (Am-241 source test), re-started the test with small size scintillator



- 시간분해능의 신틸레이터 크기 의존성 확인 (크기가 커질수록 분해능이 저하됨).  
100 x 9 x 3 mm<sup>3</sup> 크기의 신틸레이터로 100ps 시간분해능을 얻음.



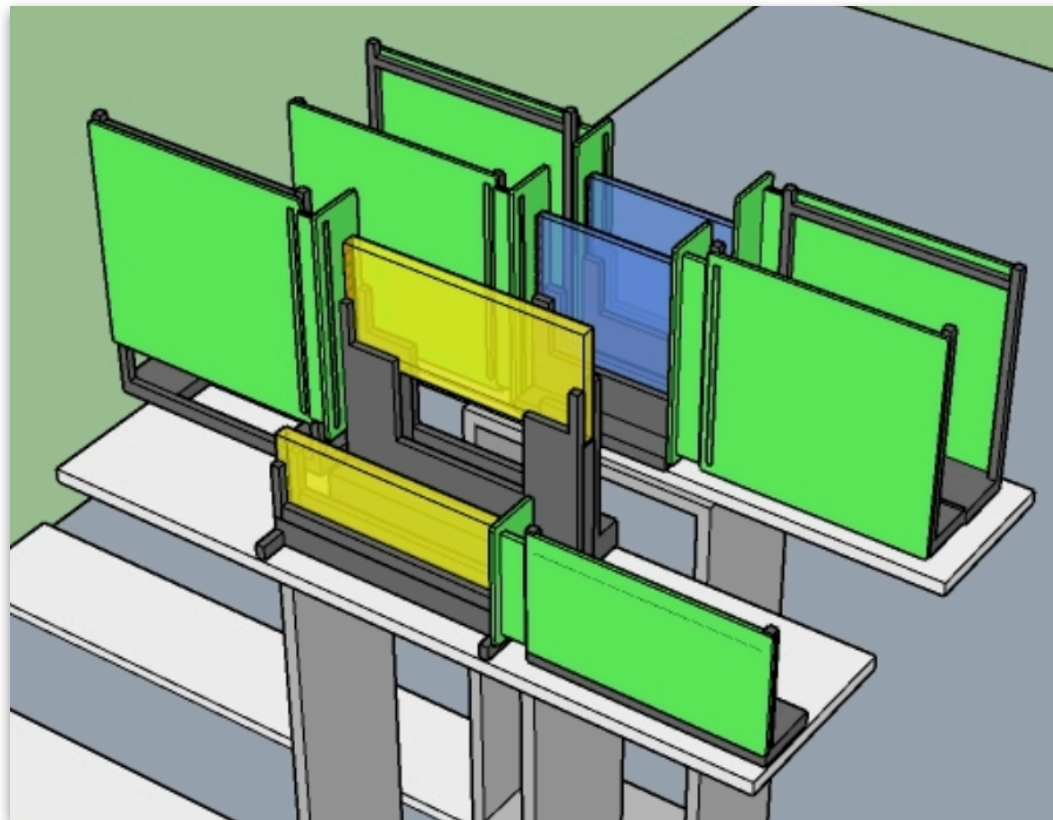
- 30mm x 50 mm x 5 mm<sup>3</sup>:  
timing resolution ~ 130ps



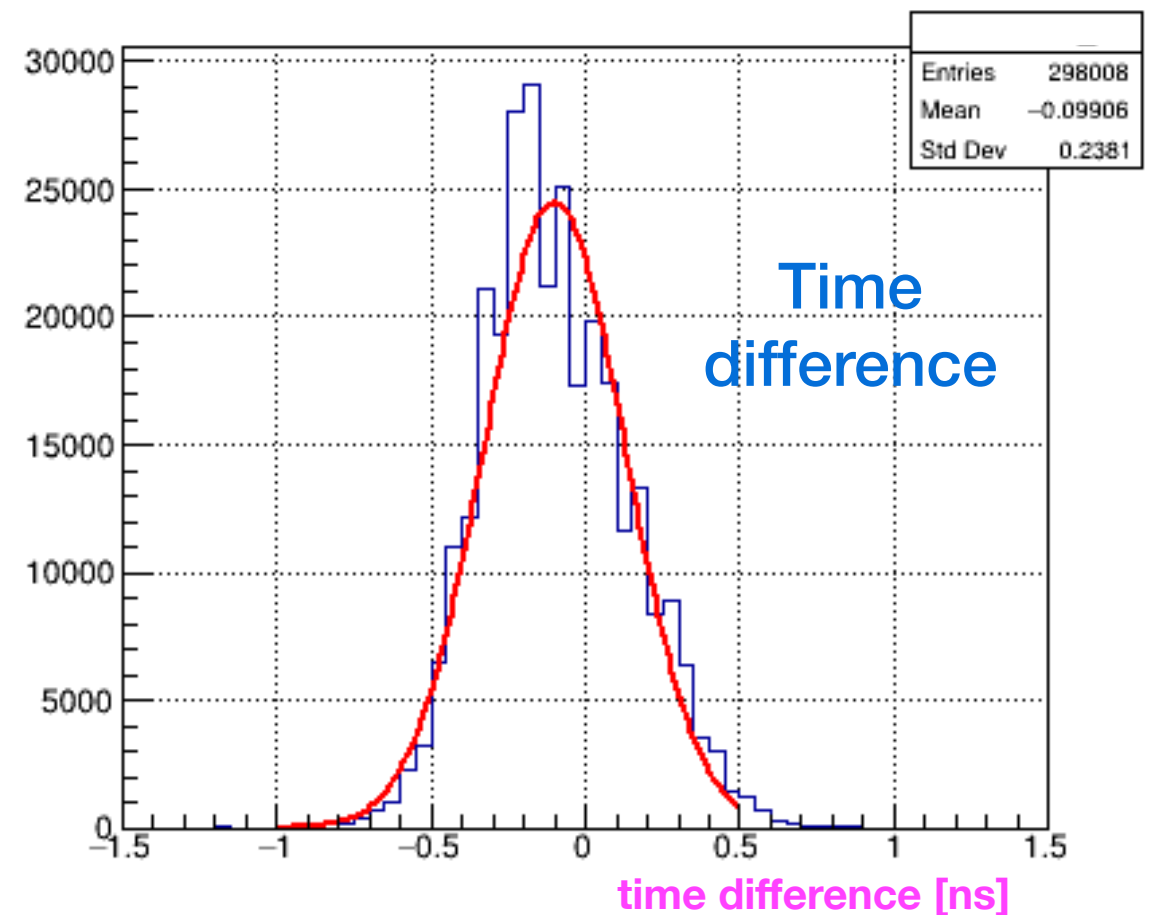
PARAMETER	NAME	VALUE	ERROR
	Constant	1.12334e+04	3.07693e+0
	Mean	3.55168e-01	4.07364e-0
	Sigma	1.85080e-01	3.05435e-0

# 2020년 prototype 제작 및 테스트 결과

- ❖ 100MeV 양성자 빔테스트로 얻은 timing resolution: 200 ps ~ 300 ps
  - ▶ Resolution degradation wrt the time (beam exposure), need further investigation (due to direct radiation or not enough restoration time)



- 60mm x 60 mm x 3 mm<sup>3</sup>



- ❖ DAQ TDC, QDC multi-event buffer 관련 문제
  - ▶ Need further investigation



# 2021년 계획

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## 2월 ~ 5월

- ❖ 본제품 크기의 (SC:  $100 \times 100 \times 0.2 \text{ mm}^3$ , VC:  $200 \times 100 \times 5 \text{ mm}^3$ ) 신틸레이터로 시간 분해능 측정
- ❖ 경주 빔테스트 데이터 분석
- ❖ 빔테스트 데이터 timing resolution degradation 문제 이해
- ❖ DAQ TDC, QDC multi-event buffer 관련 문제 해결 및 스트레스 테스트
- ❖ 본품 프레임 디자인 (기존 디자인 수정)

## 2분기

- ❖ 주문 가능한 부품 주문 시작