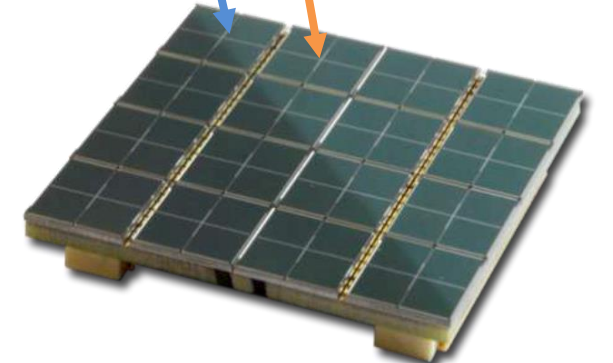
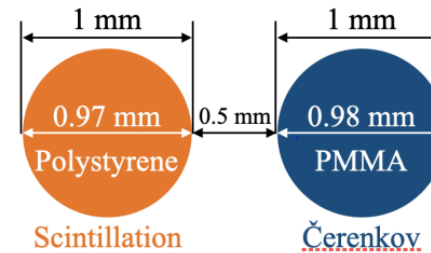
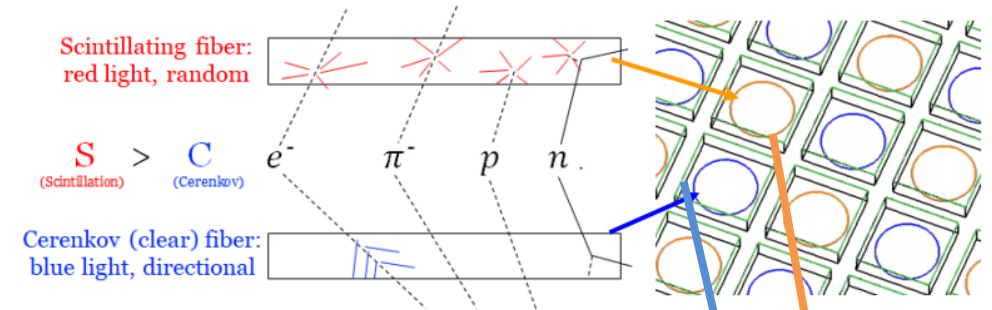
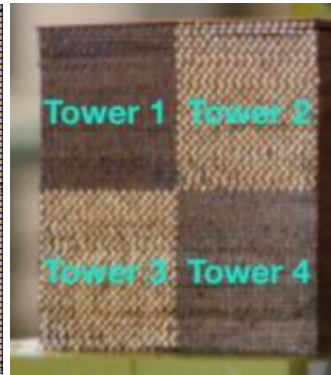
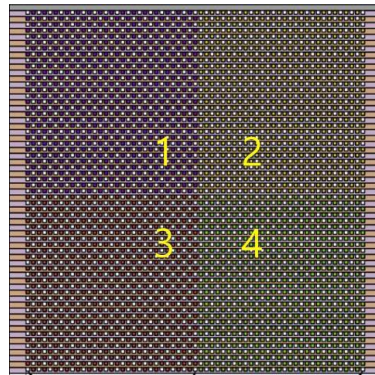
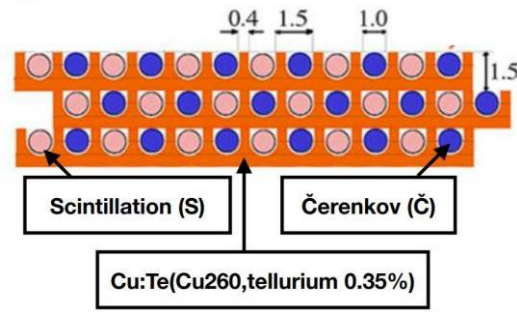
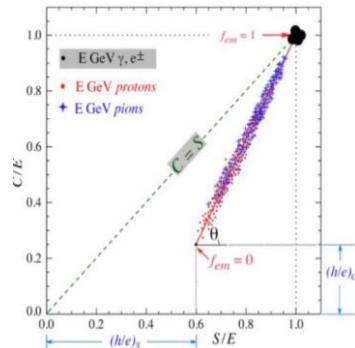
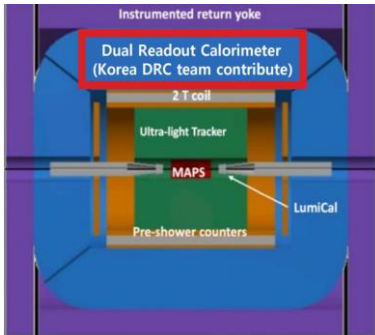


# Introduction

- The dual-readout calorimeter is high-quality energy measurement for both EM particles and hadrons.
- The compact size of SiPM makes it possible to couple individual fibers in the calorimeter and the excellent position and energy resolution can be obtained.

## IDEA detector

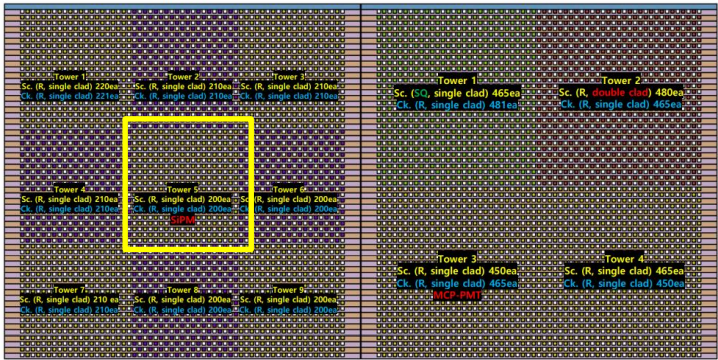


# SIPM for TB2022 DRC module

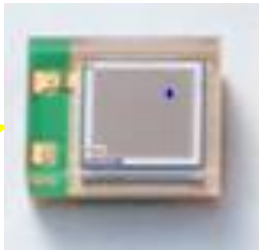
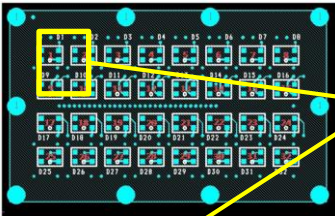
- Two DRC modules for Test Beam 2022 & SIPM channels, SIPM electronics board

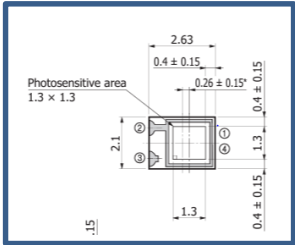
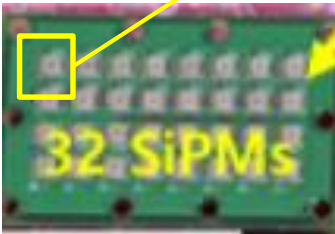
Module2

Module1

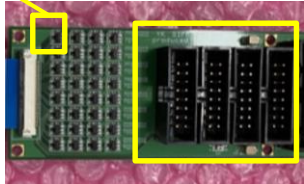
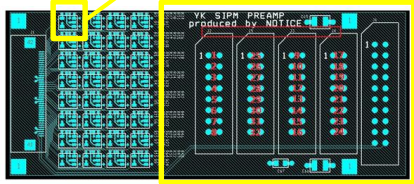



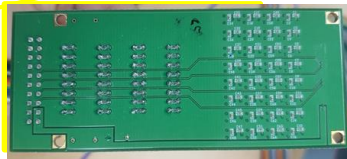
Module#2			
	Tower #1~4 and #6~9	Tower #5	Remarks
Scintillation fibers	Round / Single cladding	Round / Single cladding	They will be mounted in the 4th quarter of this year.
Cherenkov fibers	Round / Single cladding	Round / Single cladding	
Readout detector (416 ch)	16 PMTs	400 SiPMs	All PMTs have been delivered.
Model name	R11265-100	S14160-1310PS	





SIPM dimension





SIPM PreAmp board

OP Amp


Cable connection port

Resistor (250Ω)

Top

Bottom

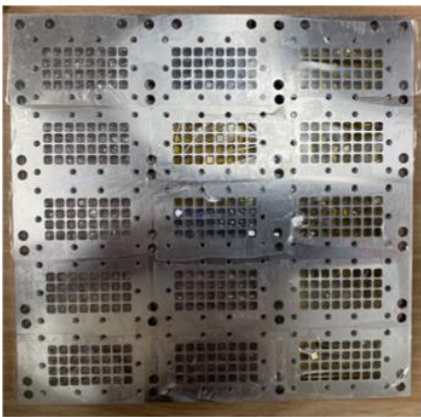
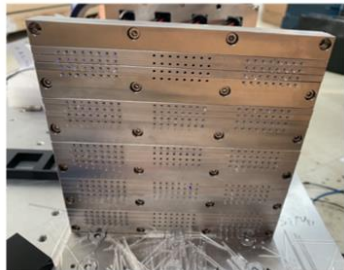
We can change the SIPM Gain using resistor & OP Amp one by one channel

SiPM	Photo-sensitive area	pixel size	photo detection efficiency (PDE)	number of pixels	photo
S14160-1310PS	1.3x1.3 (1.69 mm <sup>2</sup> )	10 μm	~15% at 400 nm ~17% at 550 nm	16675	

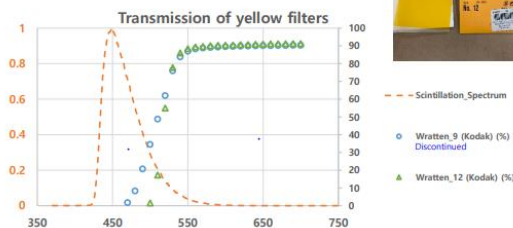
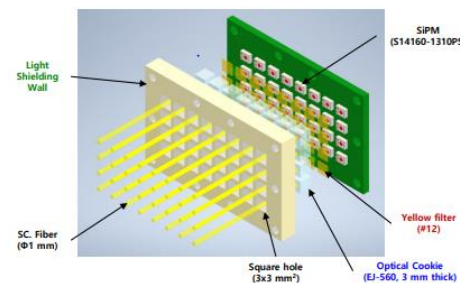


# SIPM Assembly with DRC Module

- Assembly the Fibers & SIPM Frame using epoxy, Attached SIPM & Fibers

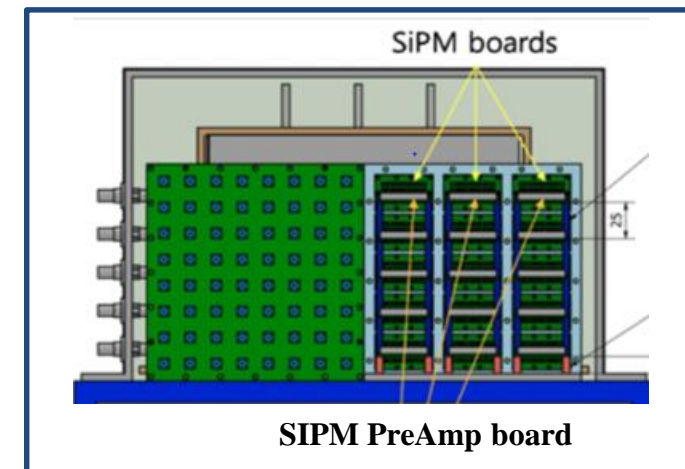


SiPM board for 32 scintillation fibers



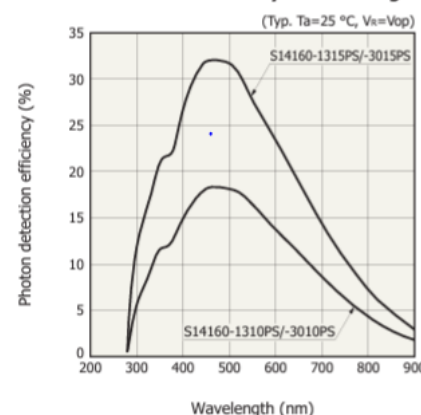
Note that changing the yellow filter from #9 to #12,  
-> reduced transmission near 500 nm wavelength  
-> similar light transmission over 530 nm

9



Readout part

Photon detection efficiency vs. wavelength



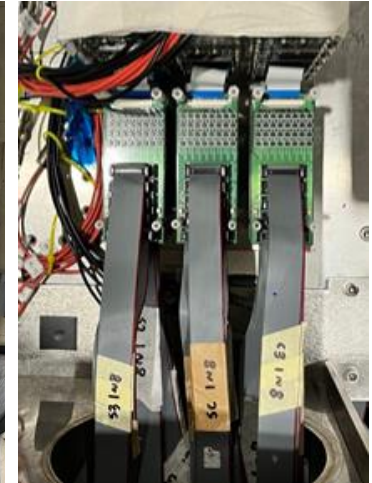
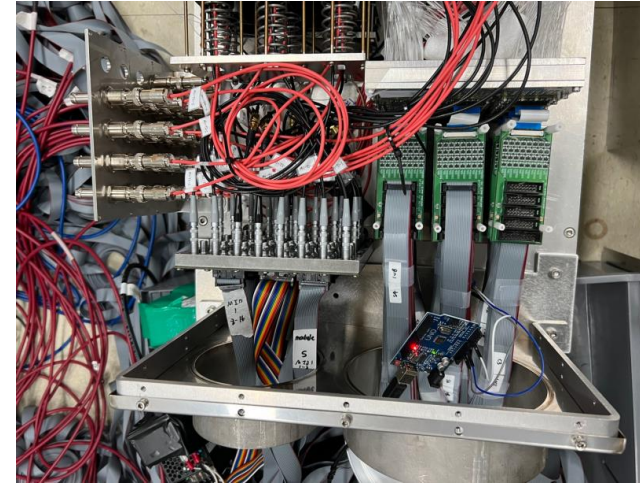


# Connection of SIPM & DAQ system

- We connected the SIPM electronics boards & DAQ system using cables..



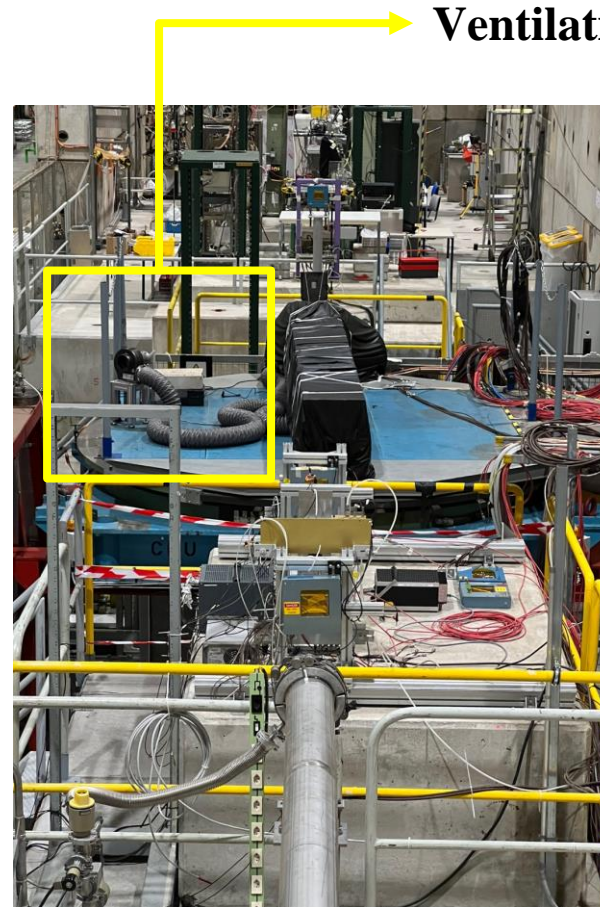
DAQ board



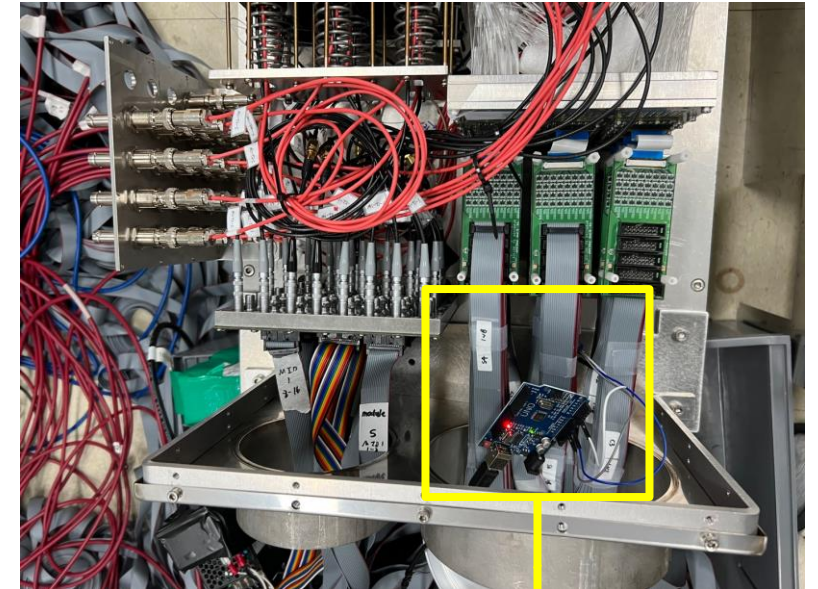


# Connection of SIPM & DAQ system

- Operation & Data taking SIPM at TB2022.



**Ventilation cooler**



**Temperature sensor**