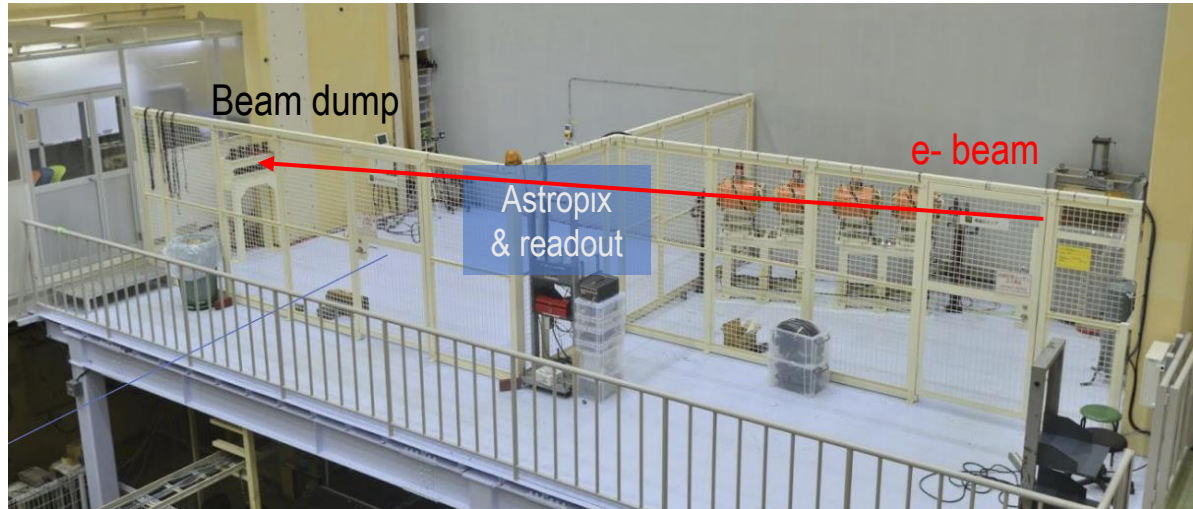


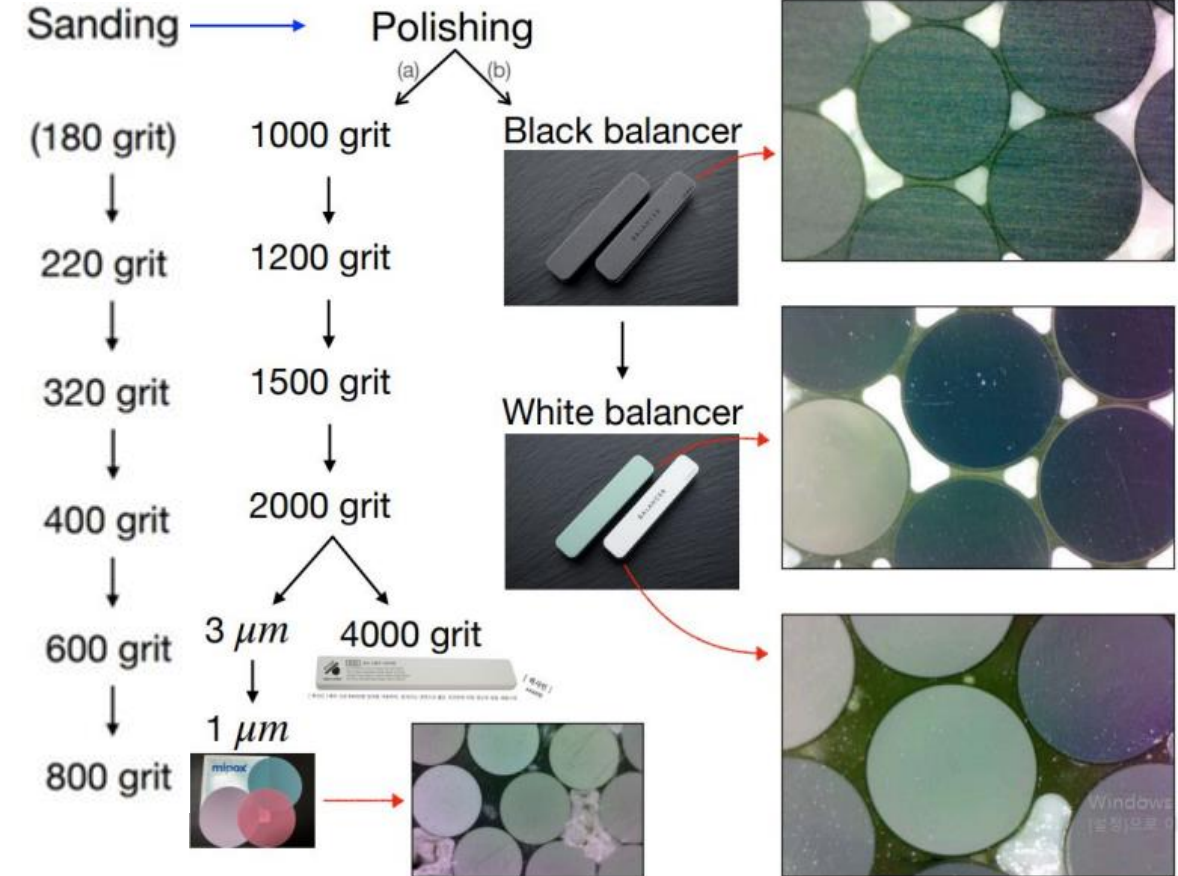
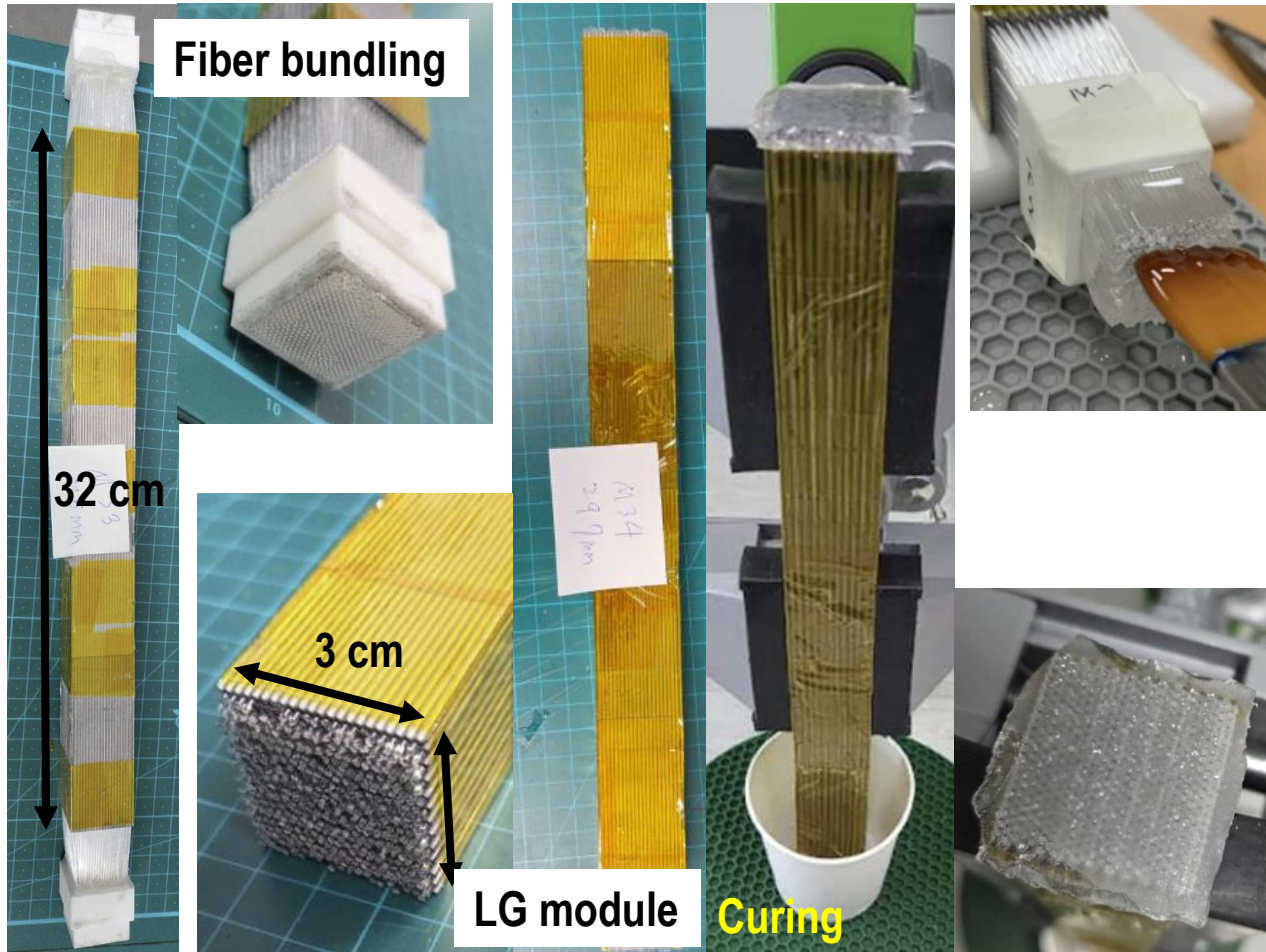
Readout system for KEK beam test

SEO Bo Gyeong, KIM Shin Hyung, SHIN Jun Seop

Department of Physics, Kyungpook National University



- Korea BIC team
- KEK (Japan) beam test : 11 June ~ 17 June
electron beam : 0.5 ~ 5 GeV/c
- Main goal: AstroPix–FADC DAQ Integration Test
(by taking MISO signals from AstroPix with FADC time stamps)



1. Module production

2 Modules : Fiber bundling module

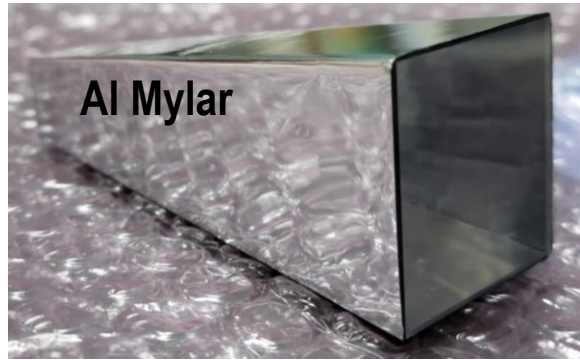
LG module

LG module : Curing with OpCement & polishing

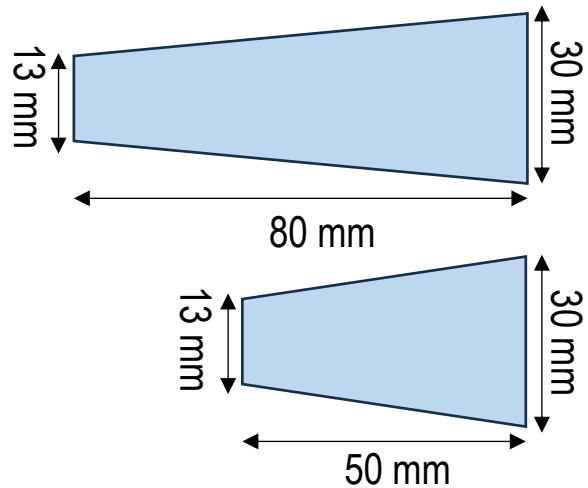
OpCement (EJ-500, Eljen)



MPPC readout



Al Mylar



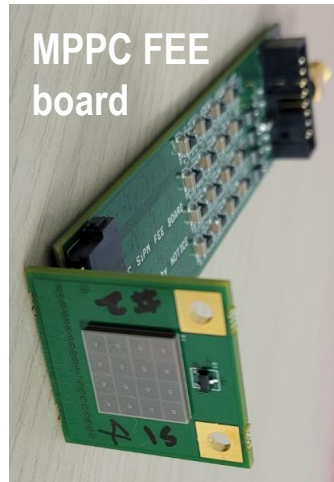
2. Lightguide attachment

LG : 3cm x 3cm, 1.3cm x 1.3cm

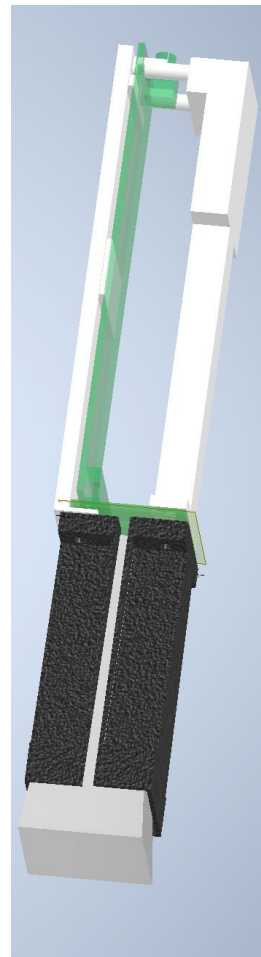
Length : 5cm, 8cm

Wrapping : Aluminium mylar
(Tedlar for GlueX)

OpGrease (EJ-560, Eljen)



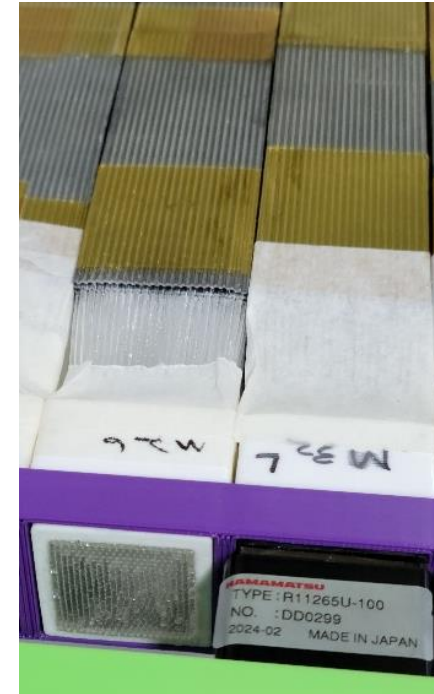
MPPC FEE
board



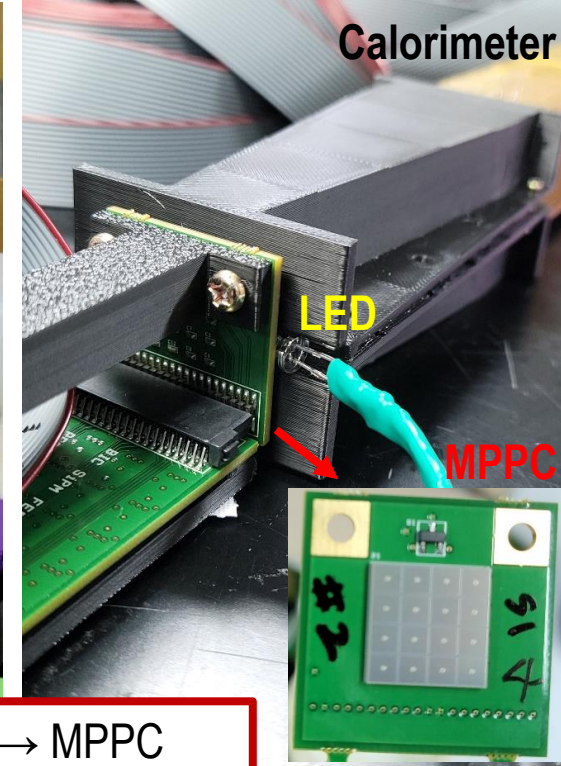
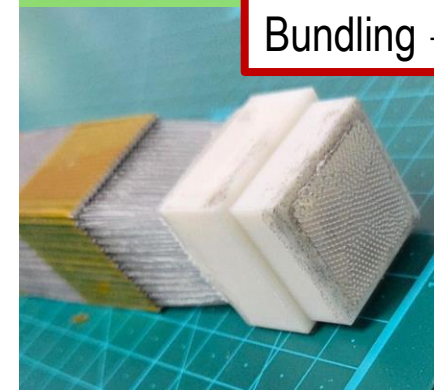
3. MPPC frame

MPPC : S14161-3050 (Hamamatsu)
S13161-3050

FEE board : summing
amplifying (OpAmp if needed)



PMT → MPPC
Bundling → Lightguide



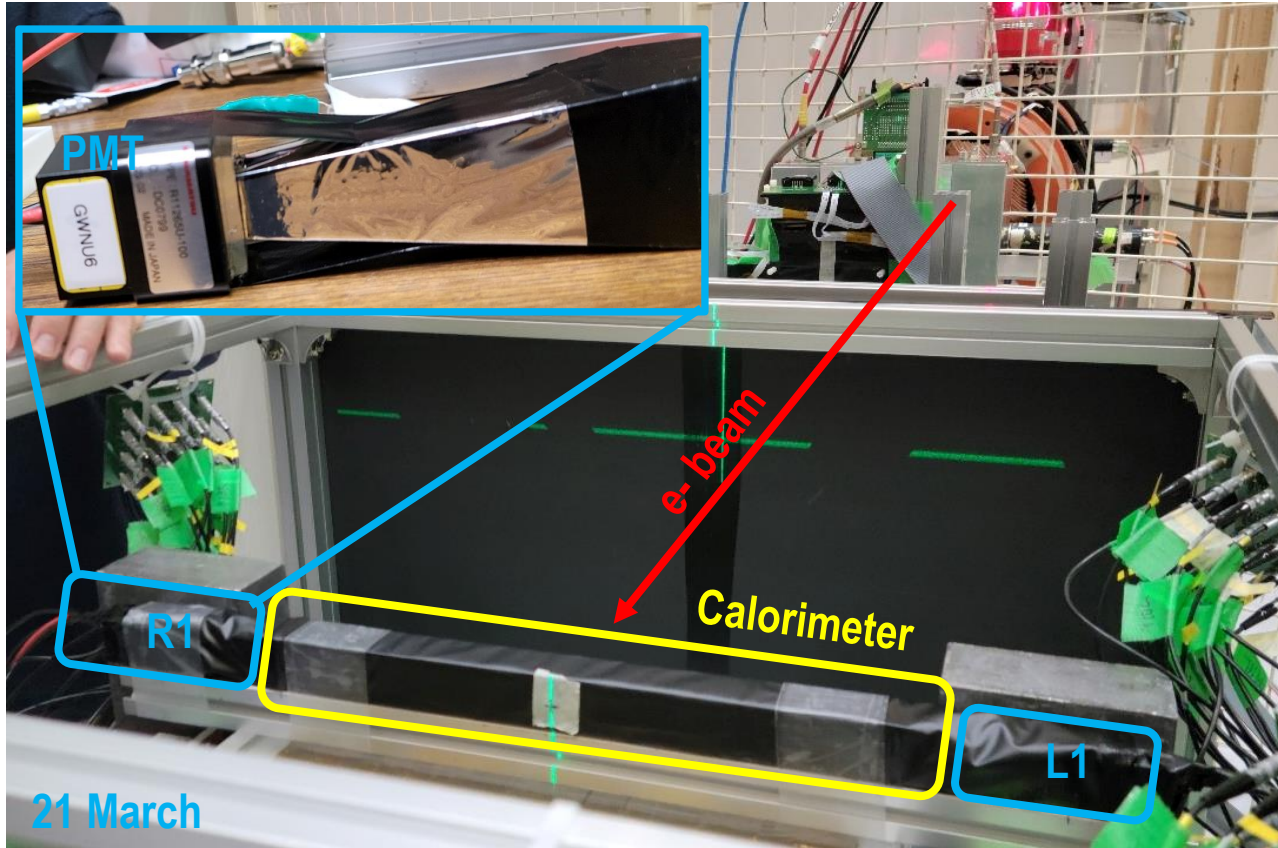
Calorimeter

LED

MPPC



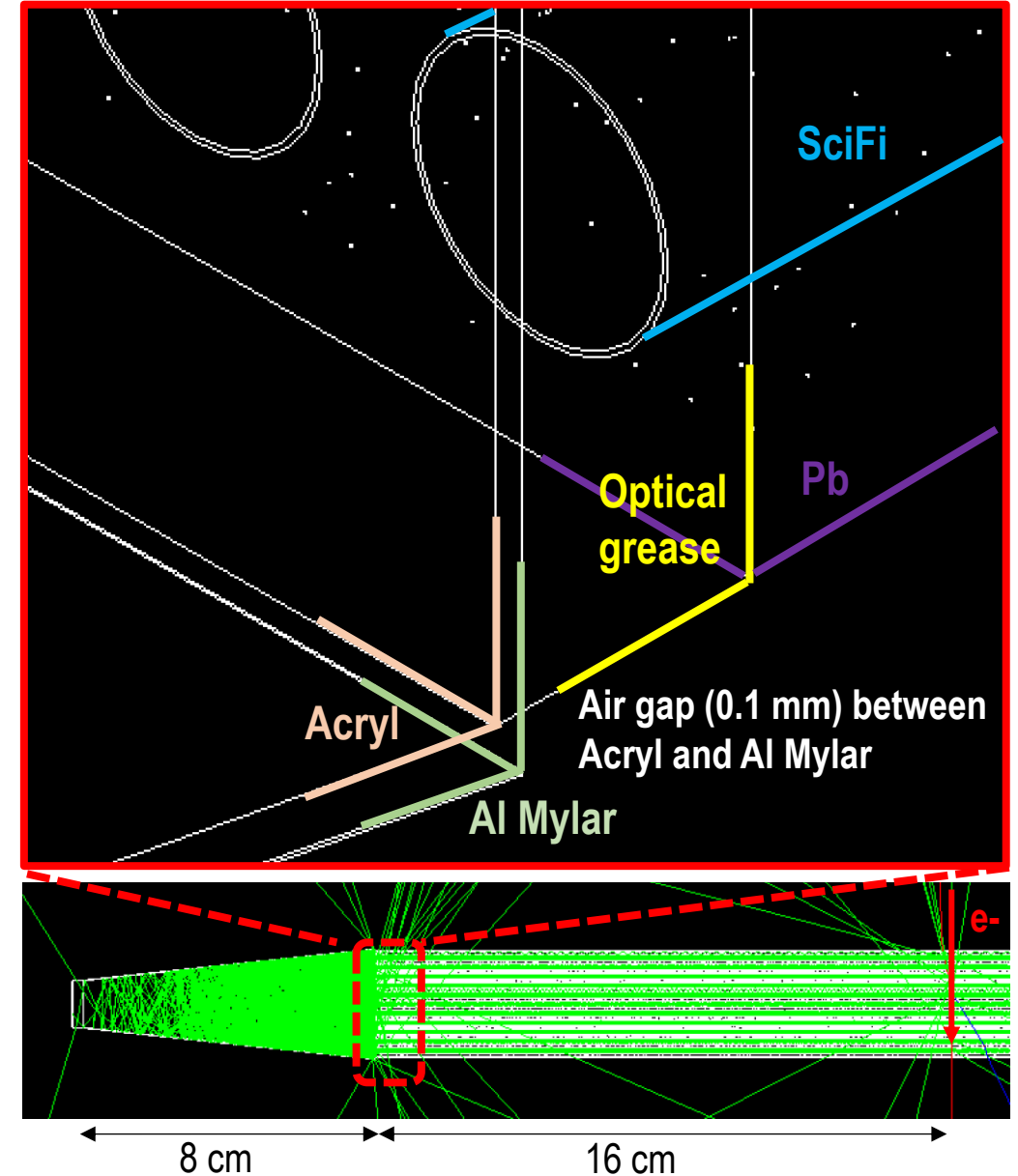
KEK PF-AR beam test



Lightguide + MPPC readout will be used (PMT used at KEK, March)

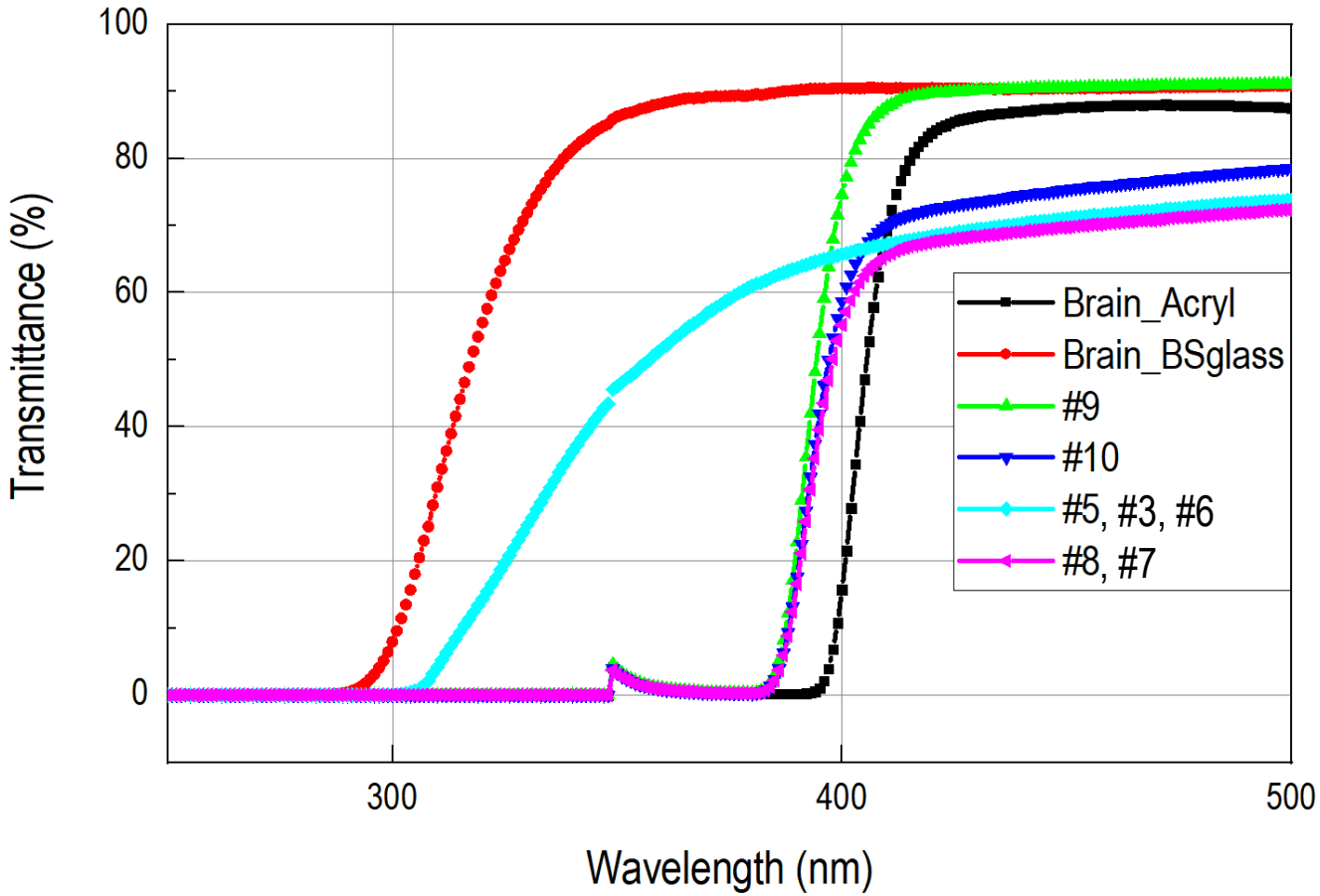
Data acquisition will be done by FADC (Notice, Korea)

Experimental results will be compared with Geant4 simulation.

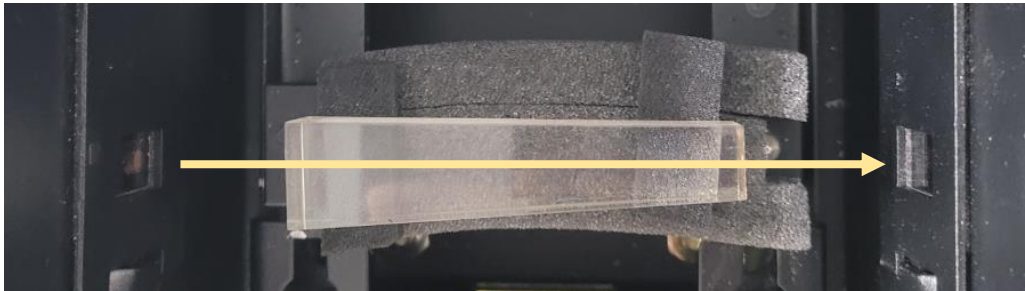




Lightguide transmittance (Recap)



No.	Company	Material	Flamed
#1	BrainShift	Borosilicate Glass	
#1	BrainShift	Cast acrylic	
#3	Ross Machine	Extruded acrylic	
#5	Ross Machine	Extruded acrylic	
#6	Ross Machine	Extruded acrylic	
#7	Ross Machine	Cast acrylic	
#8	Ross Machine	Cast acrylic	
#9	Ross Machine	Cast acrylic	Top and Bottom
#10	Ross Machine	Cast acrylic	All sides



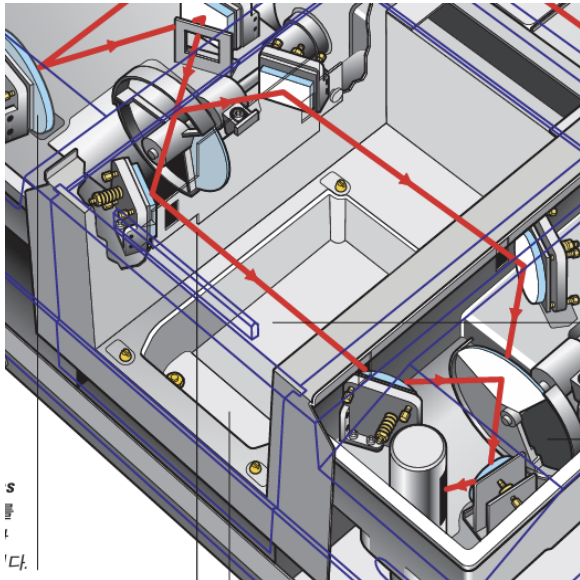


1. Beam spread at different positions



Beam not parallel

2. Optics



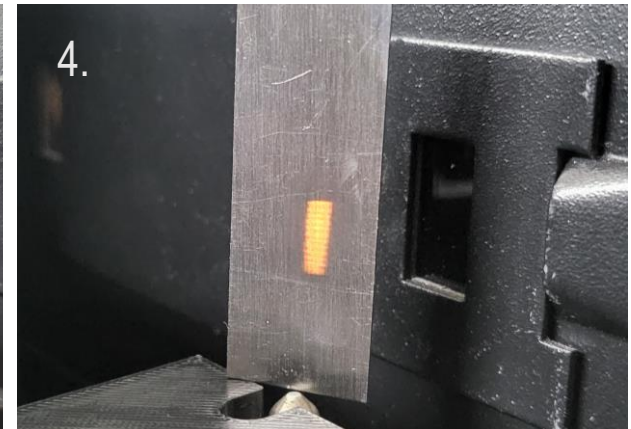
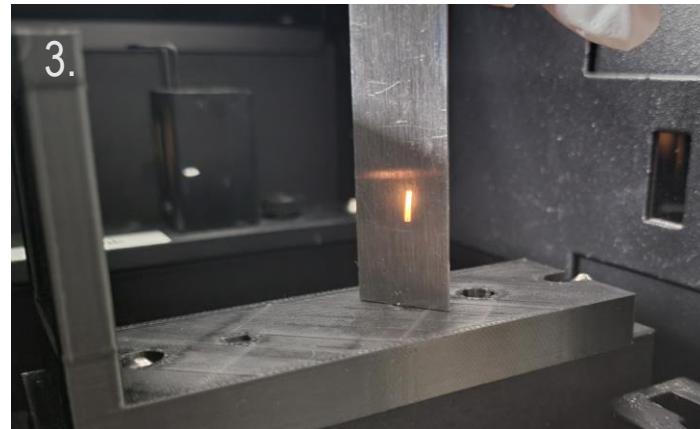
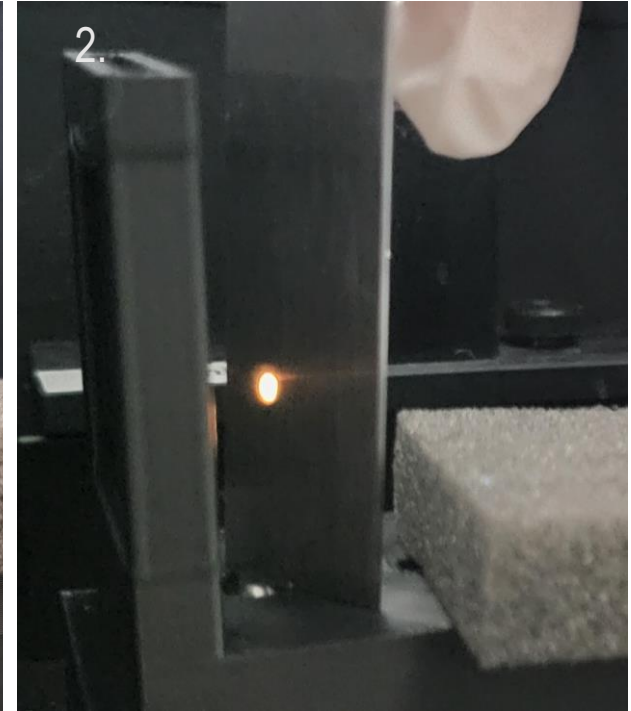
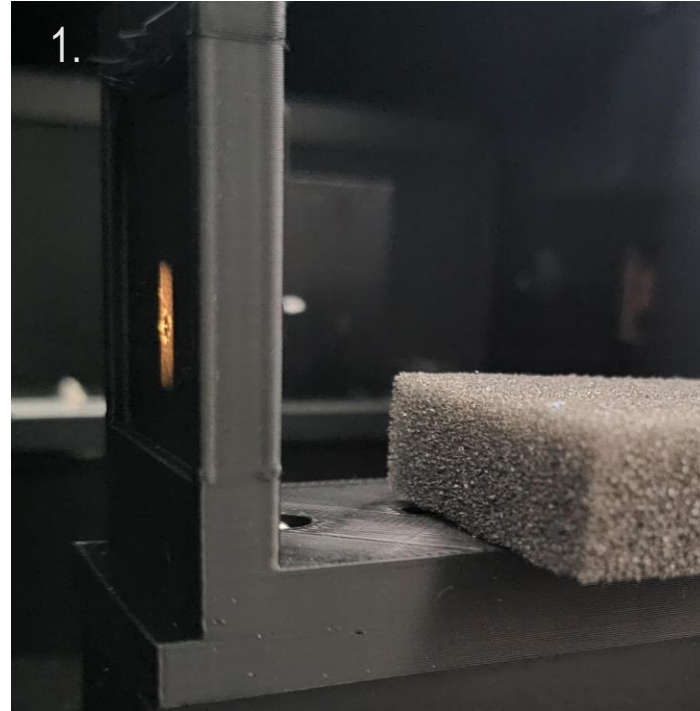
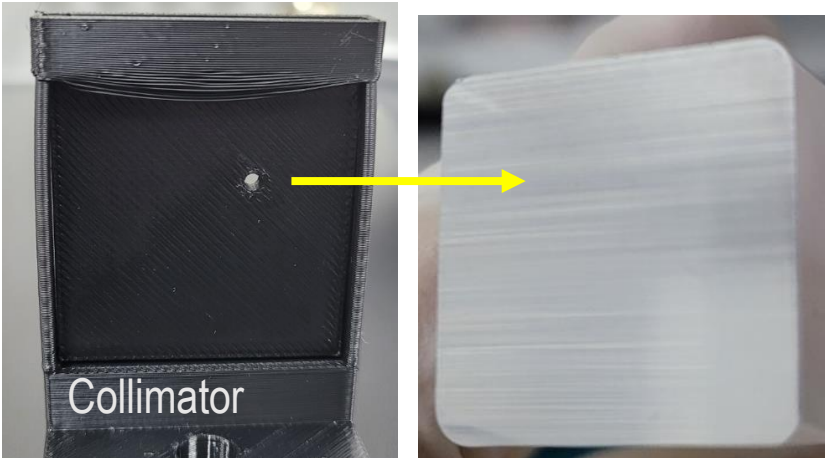
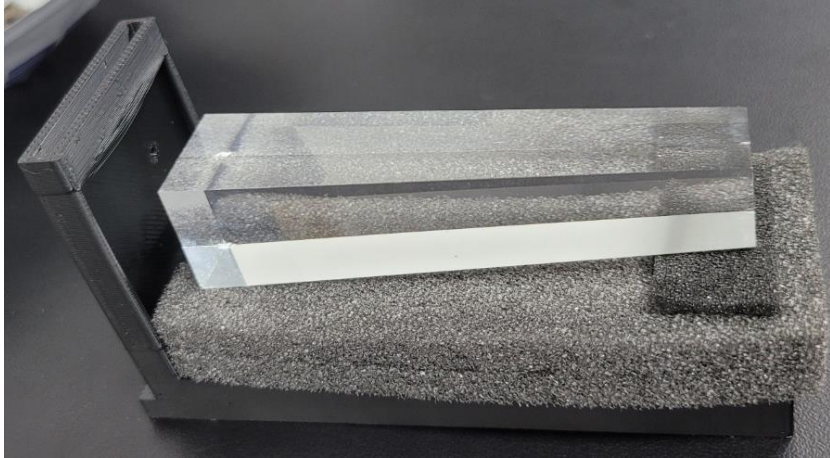
Transmitted beam is not detected directly by PMT
Mirror → Chopper → PMT

If beam does not enter normal to the window, gain might differ



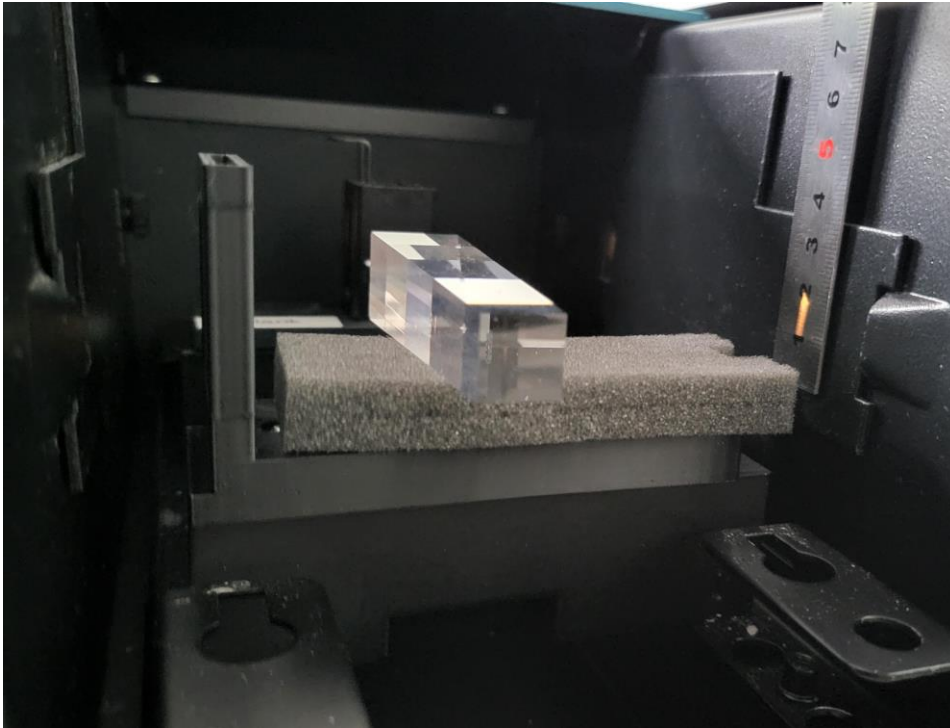
Lightguide transmittance

- 1. Beam at corners

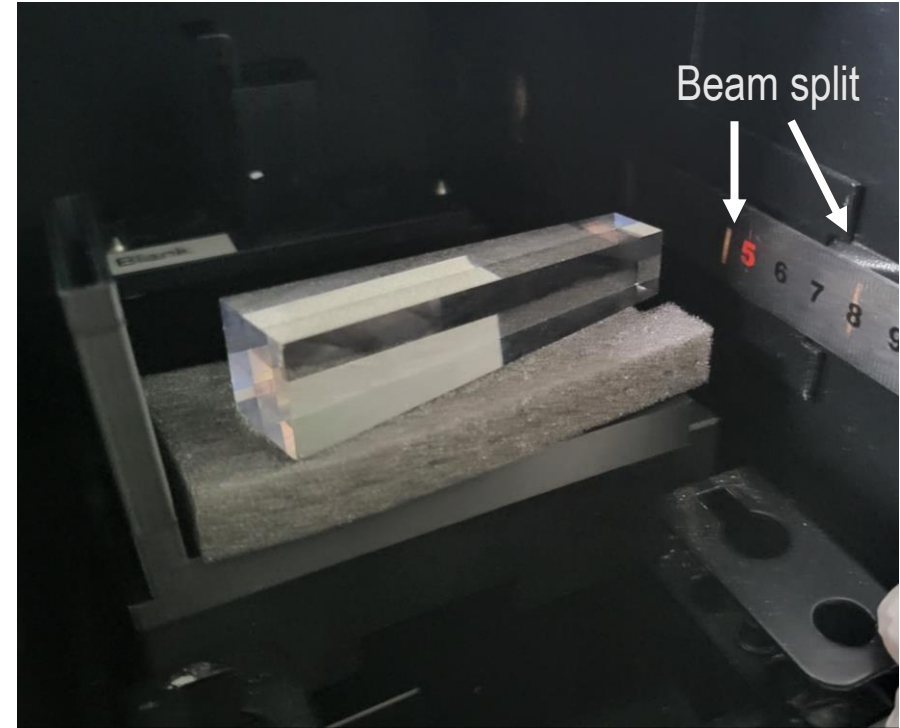
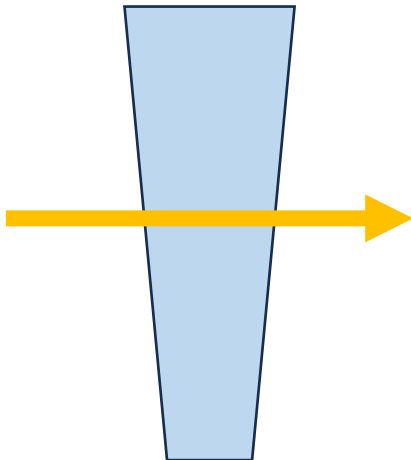




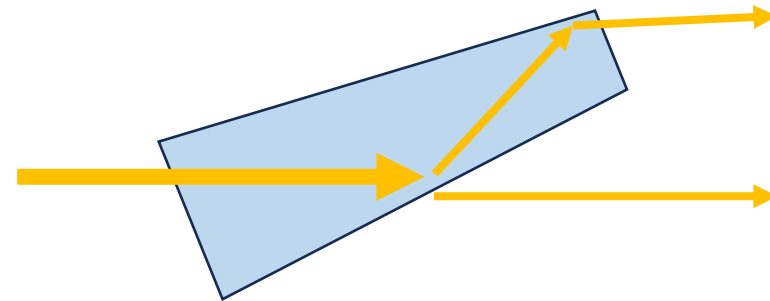
Lightguide transmittance

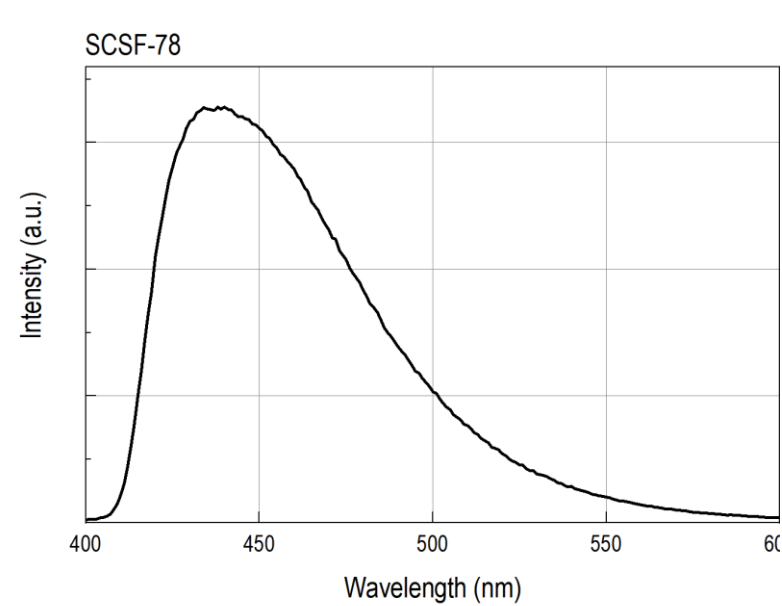
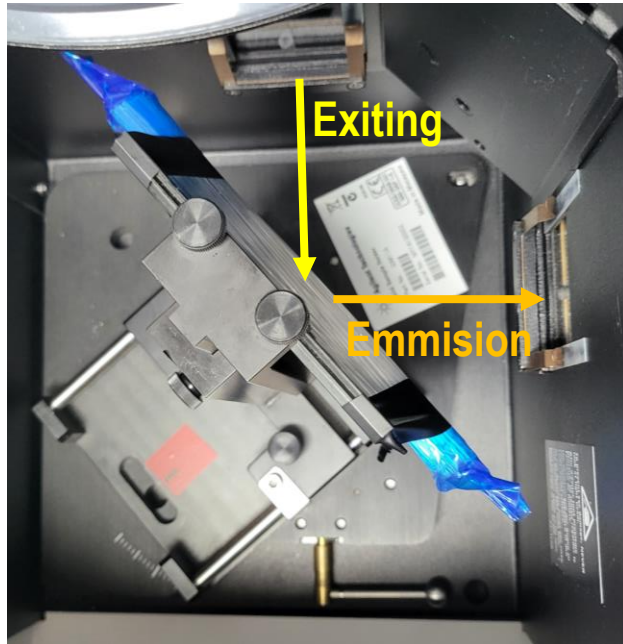
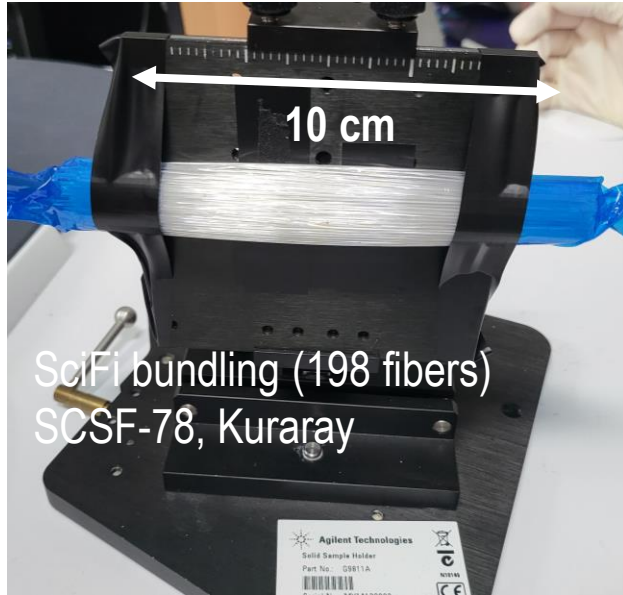


Tilted 90 ° degrees



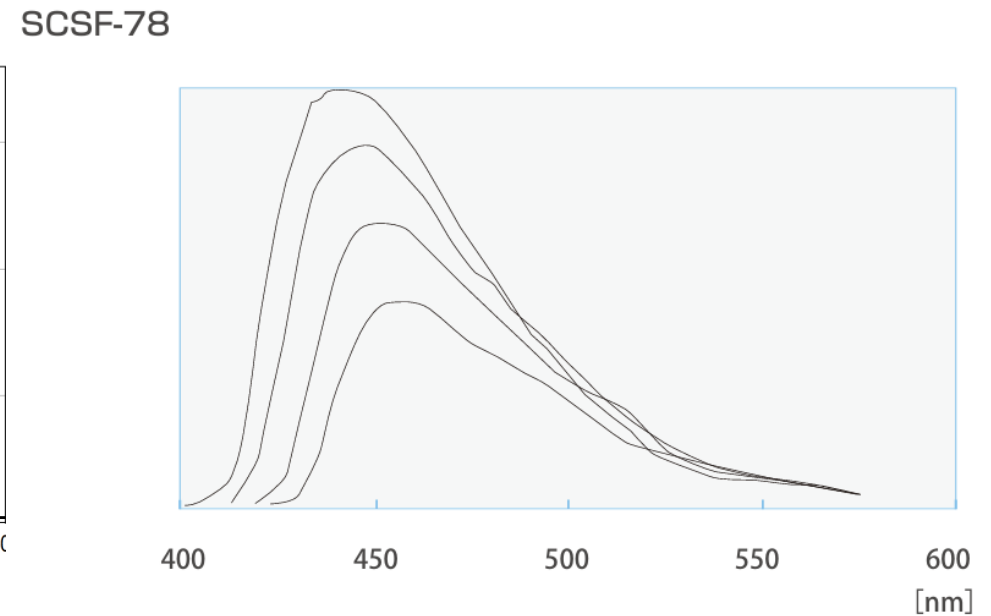
Slightly tilted
Beam splitted : unable to detect transmittance





Exiting Wavelegth : 350 nm

Measurement
Peak : 438 nm



Exiting Wavelength:350nm

Data sheet

