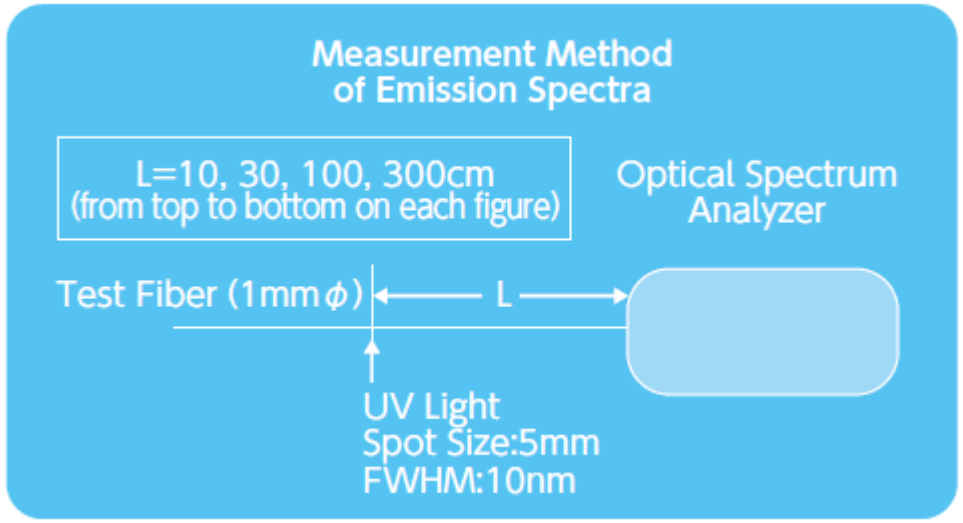
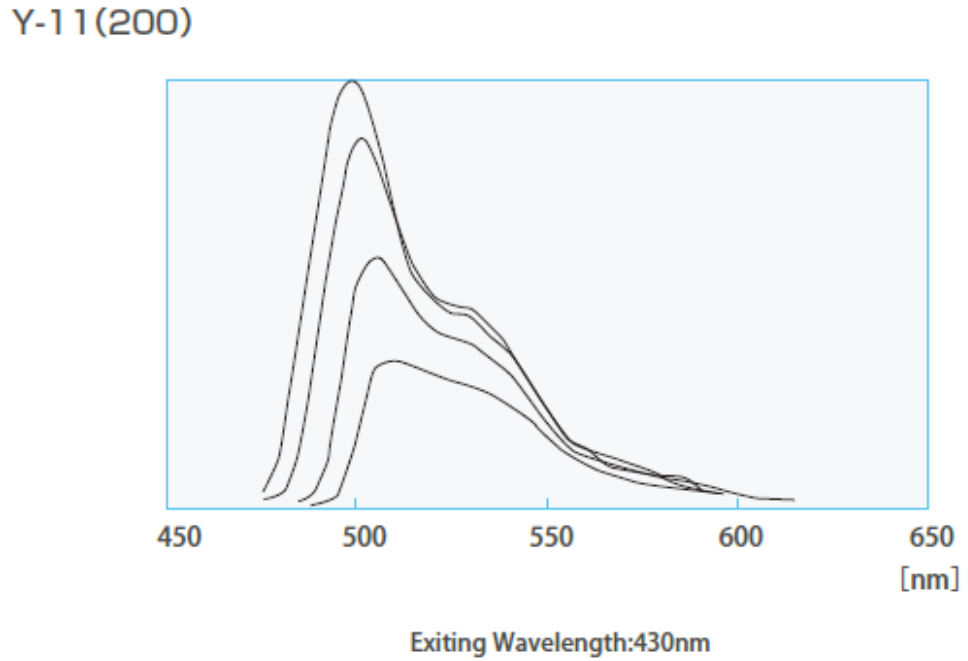
Fiber spectrum

Comparison of simulation

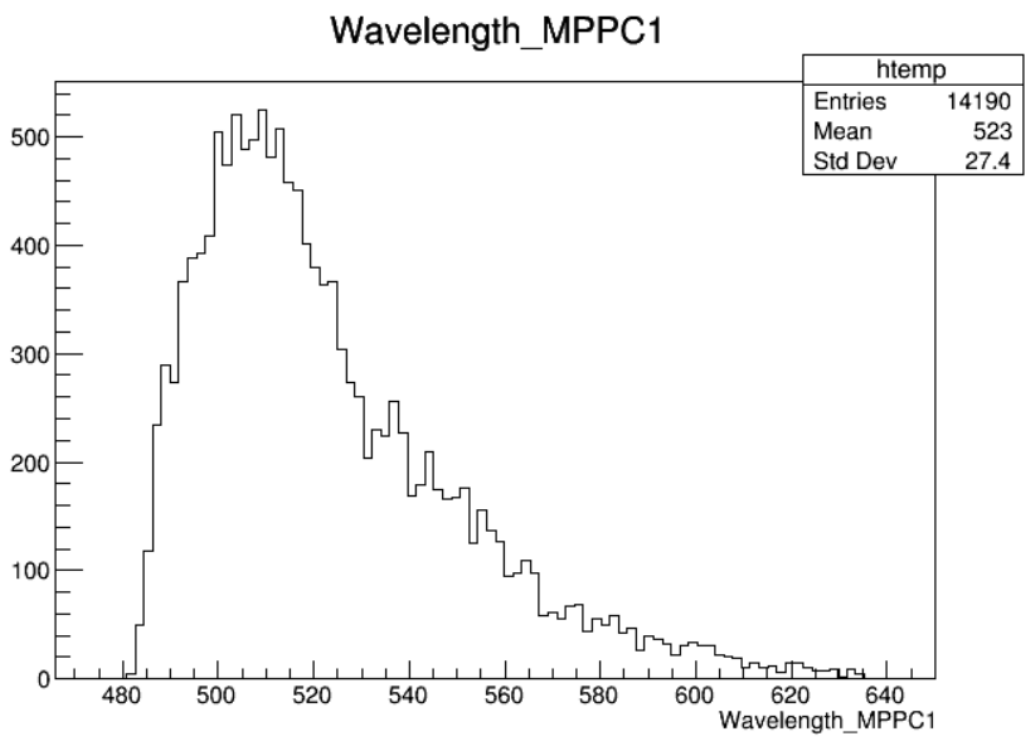




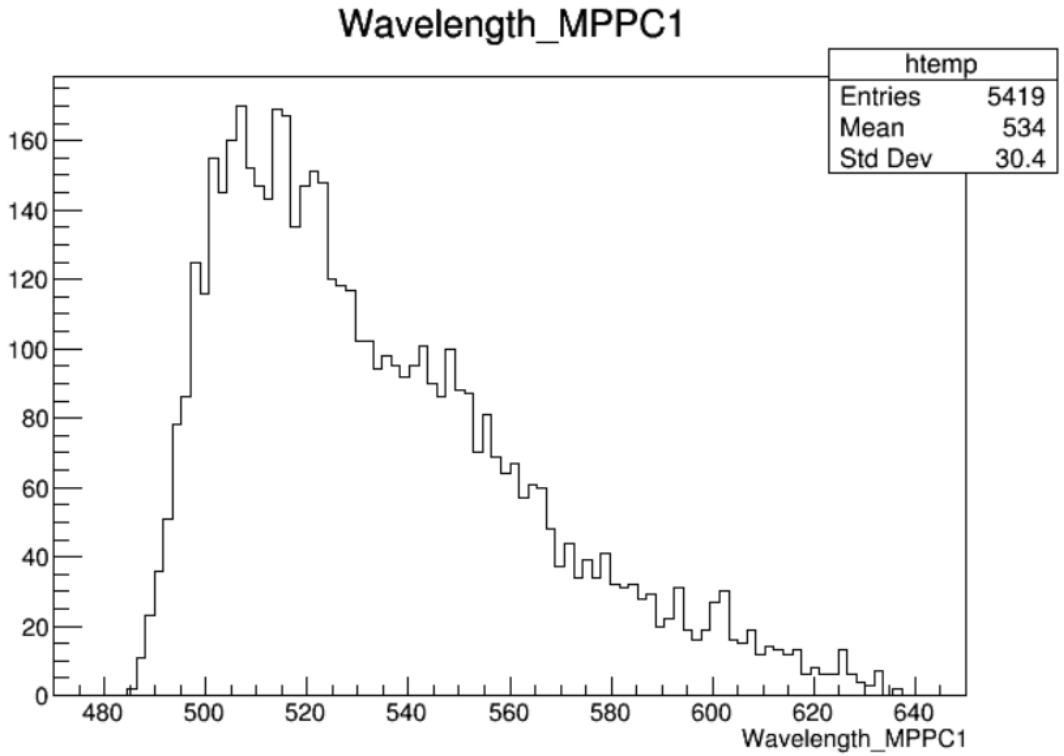
When photon of a wavelength of 430nm shoot in the end of fiber, the emission spectrum should be same as the right.

Comparison with reference

For 10 cm

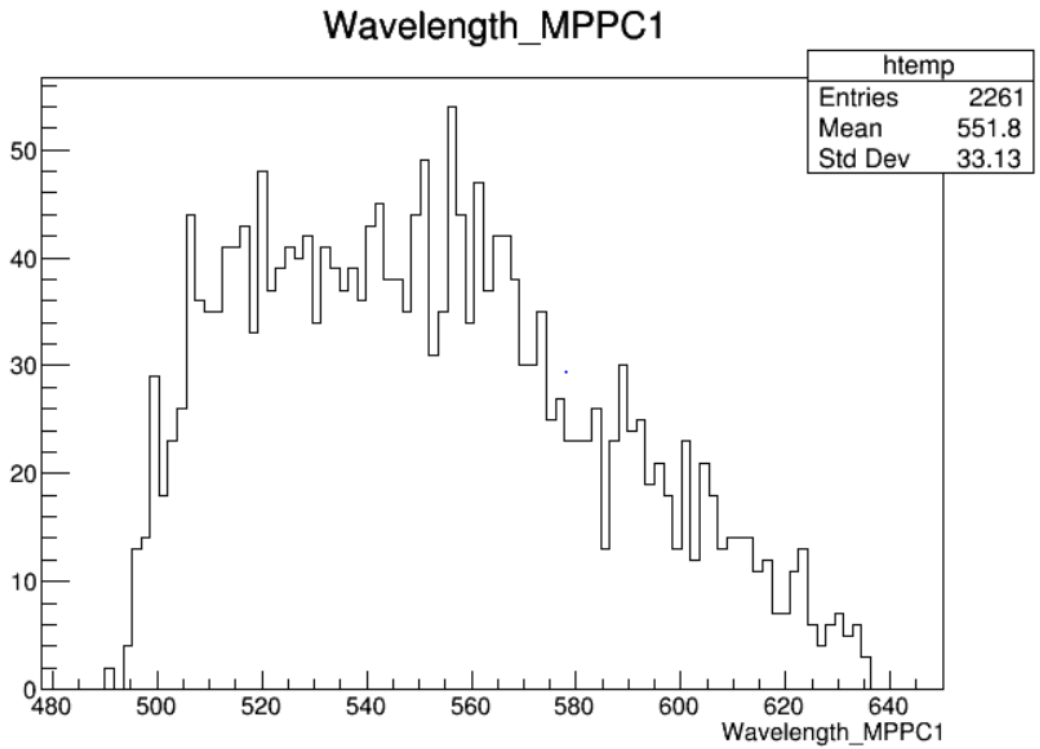


For 30 cm



Comparison with reference

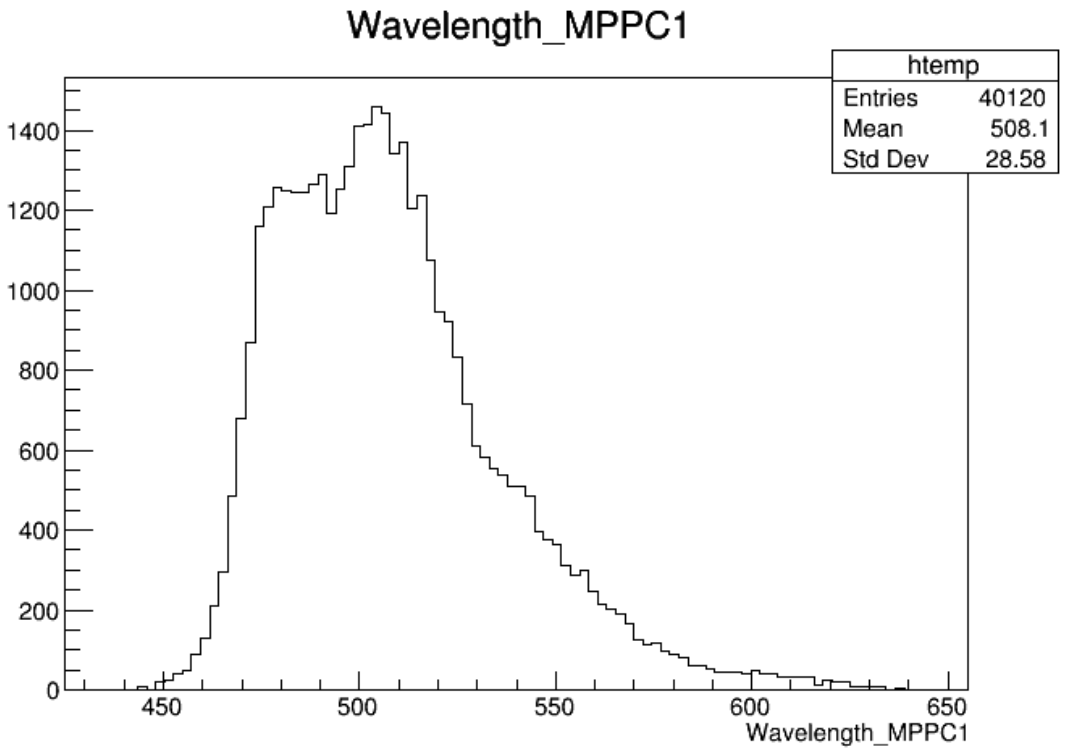
For 100 cm



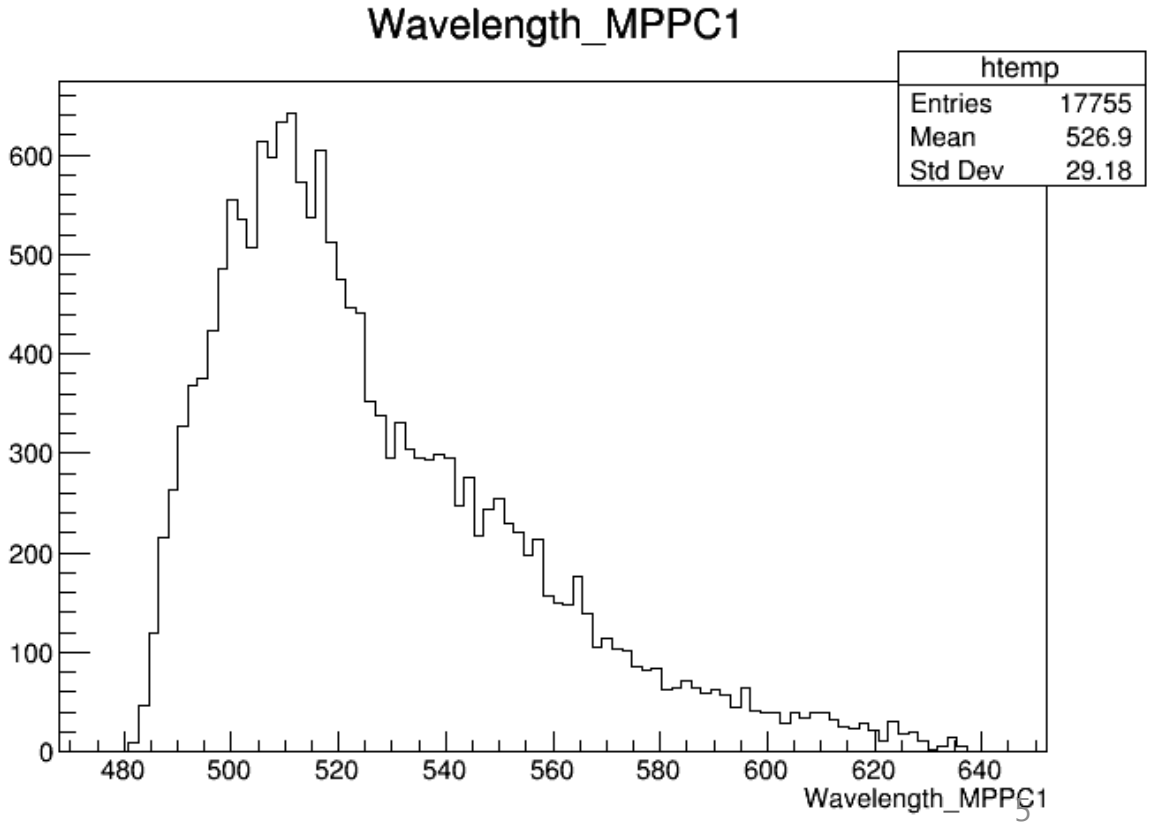
For 300 cm

Comparison with reference (옛날 ver)

For 10 cm

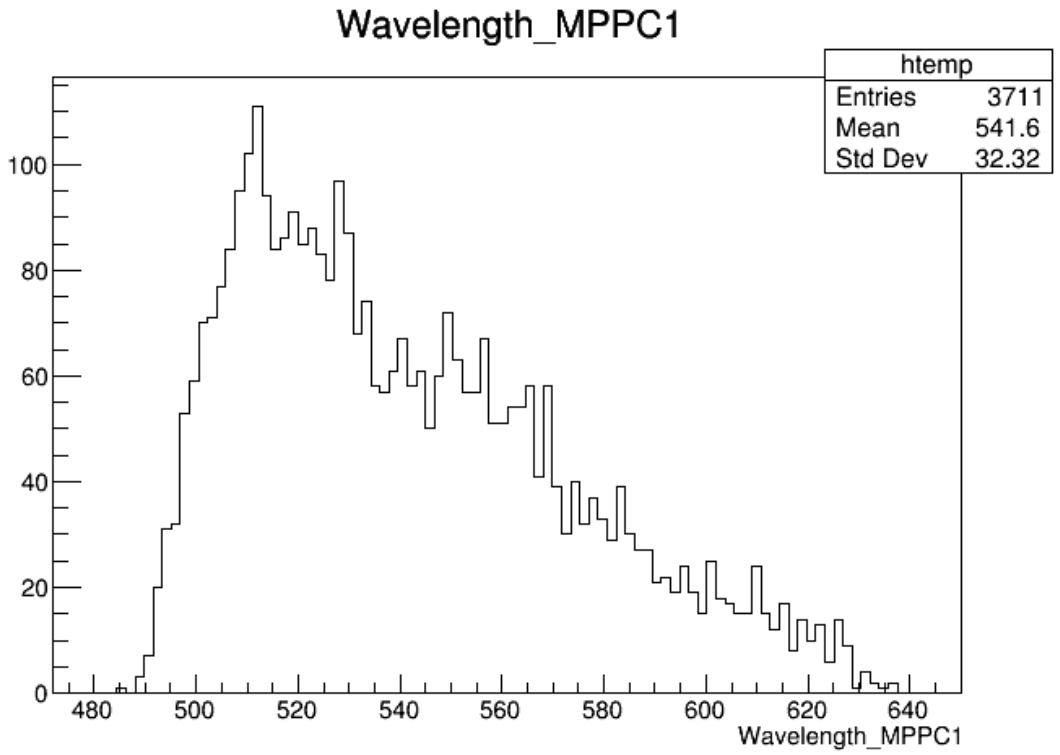


For 30 cm

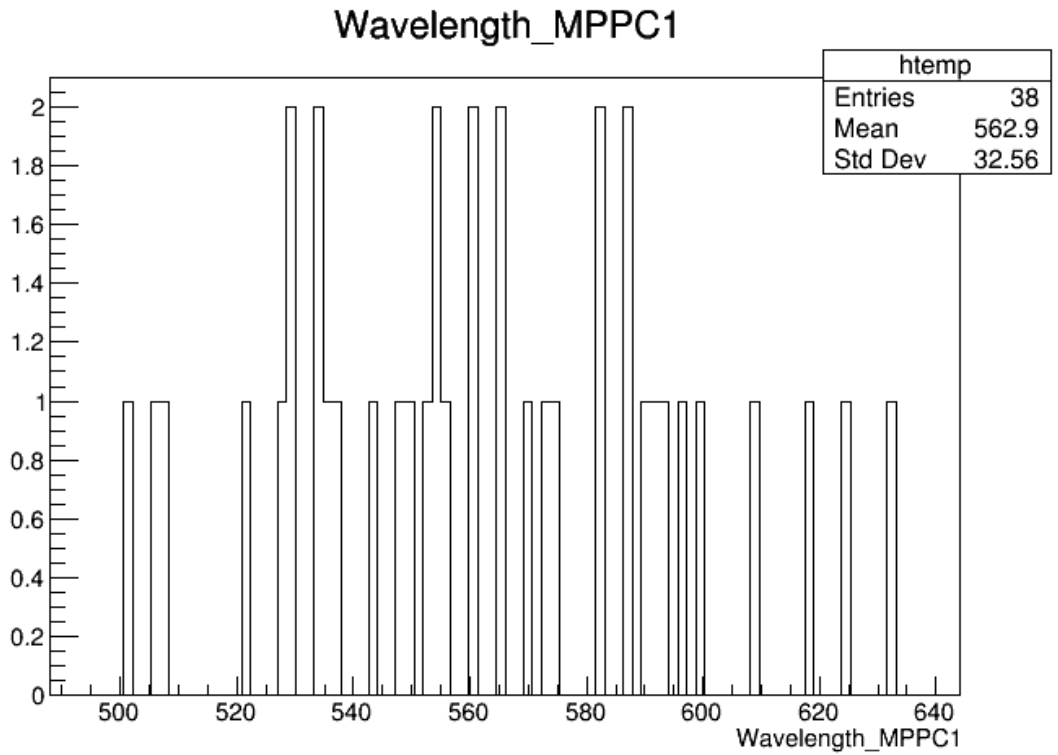


Comparison with reference(옛날 ver)

For 100 cm

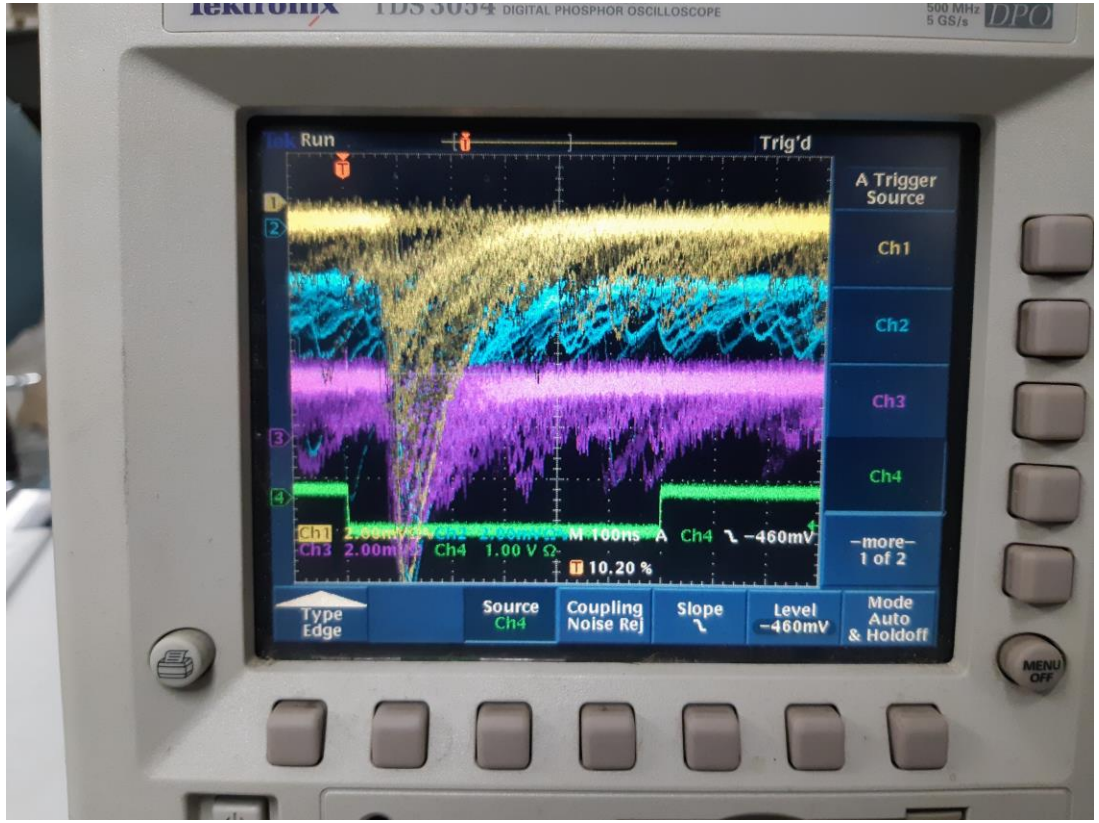


For 300 cm



MPPC signal

Single photon signal



- The photo on the left is a single photon signal viewed with an oscilloscope by hong min Kim.
- The x-axis is time and y-axis is voltage.
- One cell of x-axis is 100ns.
- One cell of y-axis is 2.00mV.
- According to this oscilloscope photo, rise time is about 20ns, decay time is about 160ns, and height is 2mV.

Single photon signal

$$V(t) = polarity \times F_1 \times F_2 \times (F_3 + aF_4)$$

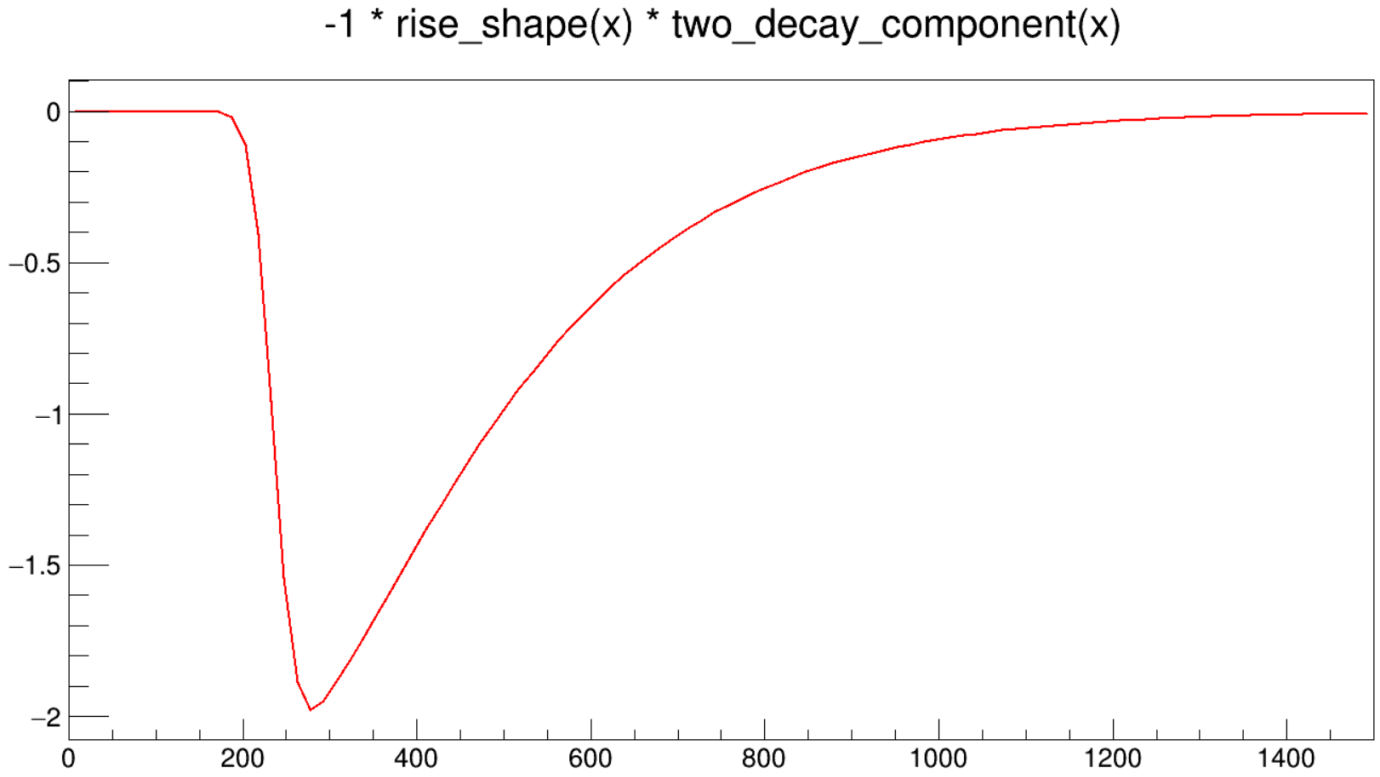
$$F_1 = Freq(\frac{t-(t_0+t_d)}{t_r})$$

$$F_2 = \frac{t-t_0}{t_r^2}$$

$$F_3 = e^{-\frac{t-t_0}{t_1}}$$

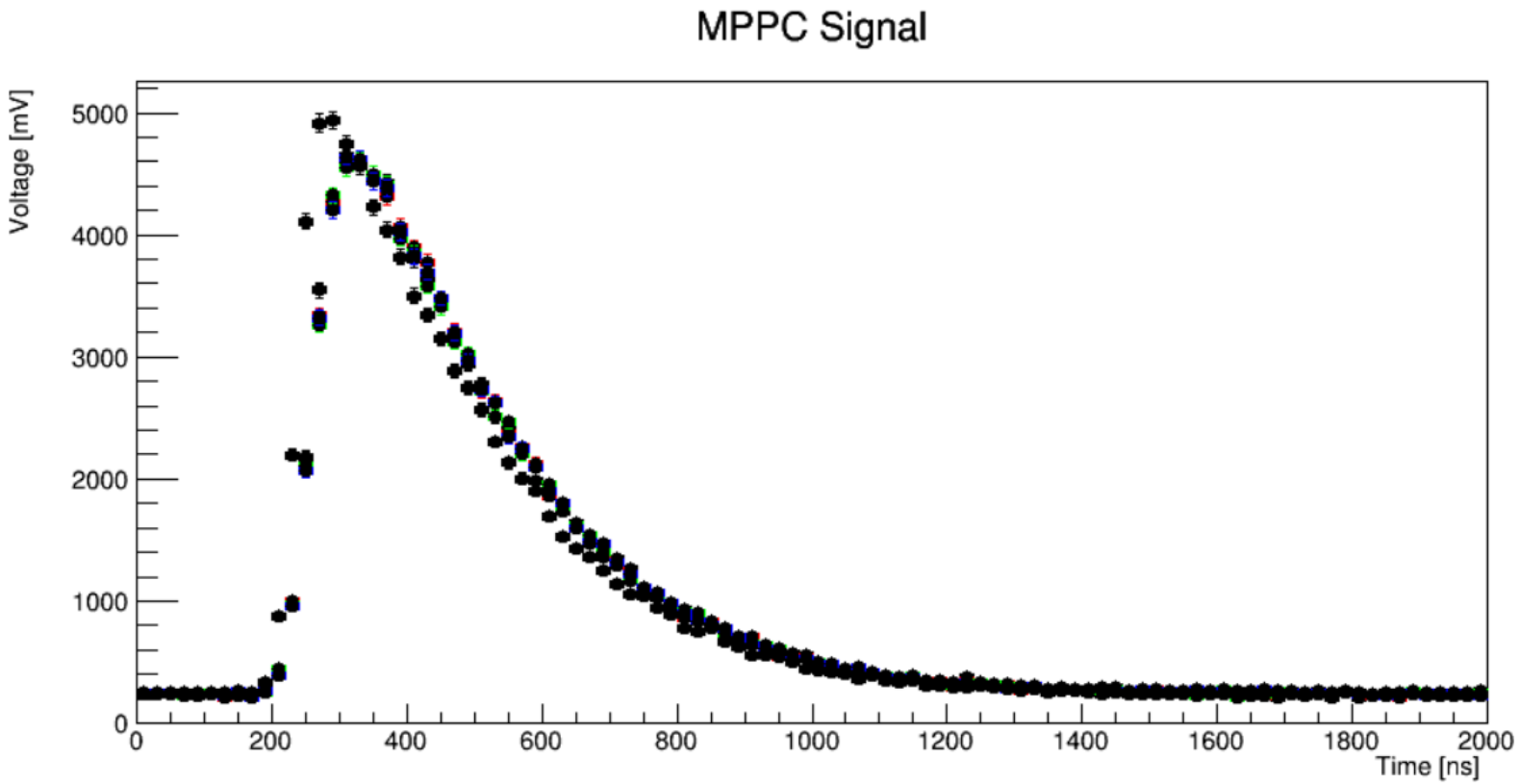
$$F_4 = e^{-\frac{t-t_0}{t_2}}$$

Single photon signal



- Single photon signal for MPPC used in DCV

DCV signal by MPPC



- By making use of convolution, we can make DCV signal with signle photon signal and arriving time.