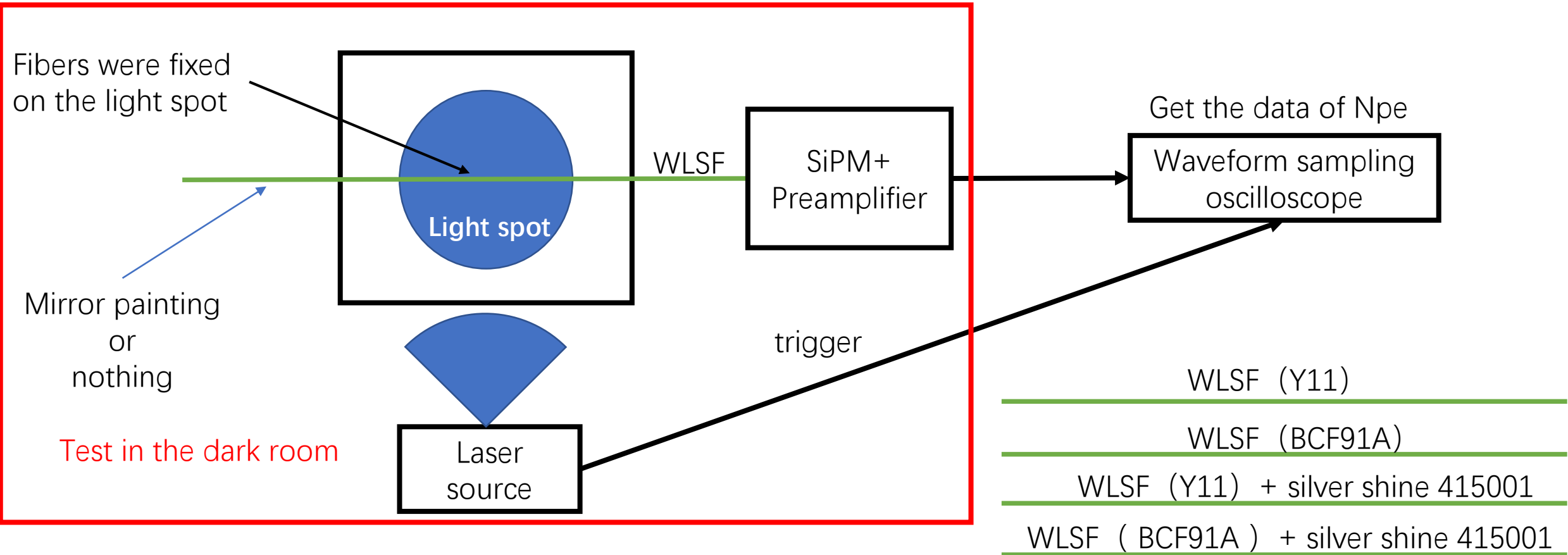


# Test of two different fiber & mirror painting



For laser source:

- 420 nm
- 1 MHz

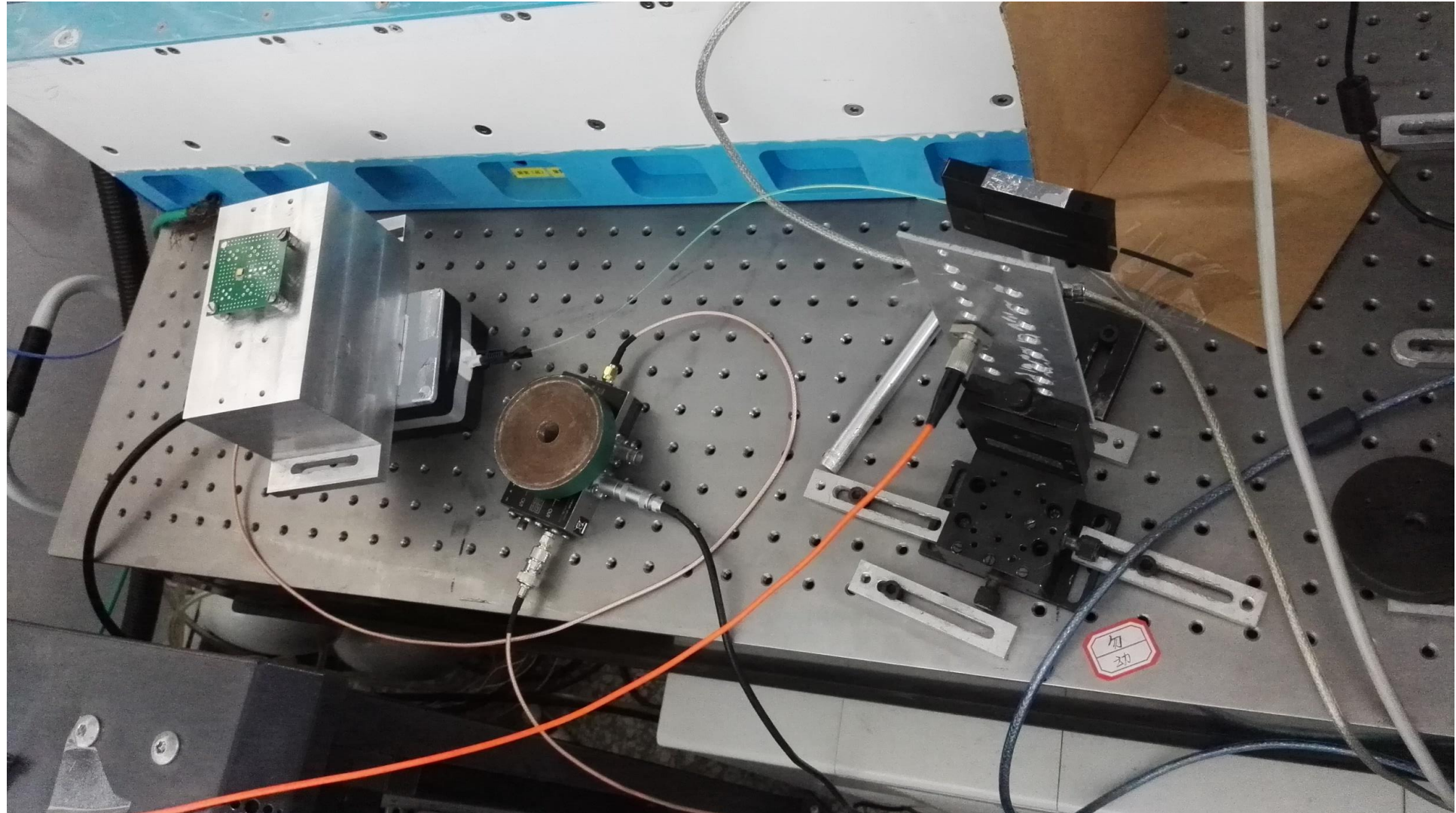
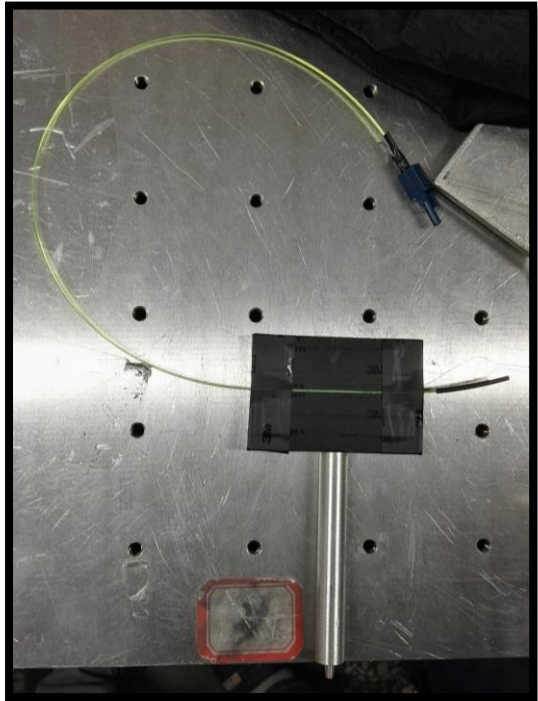
For SiPM:

- Gain :  $1.76 \times 10^5$
- $1.408 \text{ pWb} = 1 \text{ pe}$
- Voltage = 23.0 V

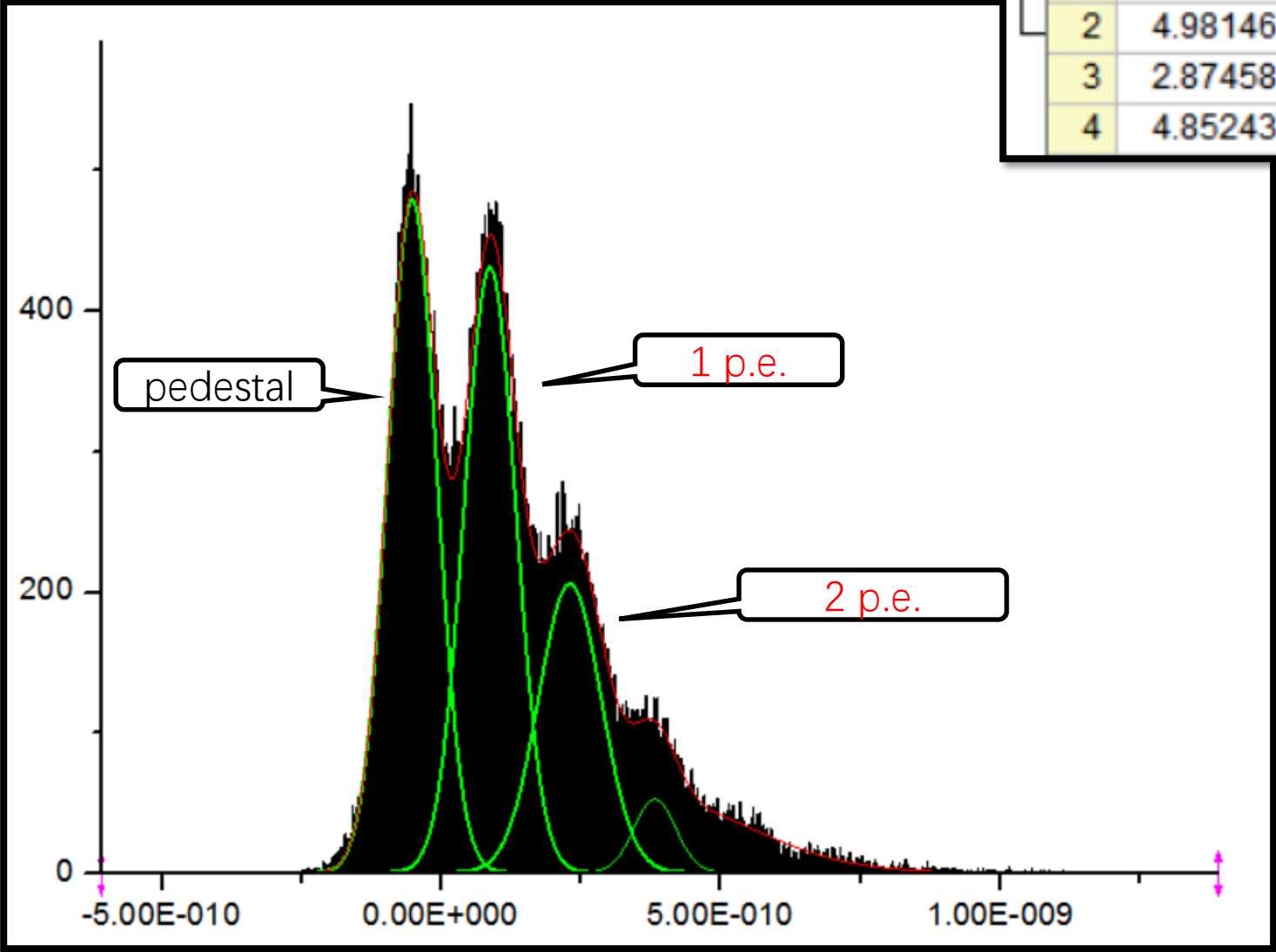
For the fibers:

- 50 cm
- Have been polished

# Set up



Gain of the SiPM (SPE)



Peaks				
	Area	Center	Width	Height
1	5.26895E-8	-5.23728E-11	8.78354E-11	478.62437
2	4.98146E-8	8.69404E-11	9.23234E-11	430.51175
3	2.87458E-8	2.29844E-10	1.118E-10	205.15001
4	4.85243E-9	3.81995E-10	7.44492E-11	52.00425

Gain

$$\begin{aligned} &= \frac{(Center2 - Center1) + (Center3 - Center2)}{2 \cdot 100 \cdot R \cdot e} \\ &= \frac{1.408pvs}{100 \cdot R \cdot e} = 1.76 \times 10^5 \end{aligned}$$

Preamplifier

50Ω for oscilloscope

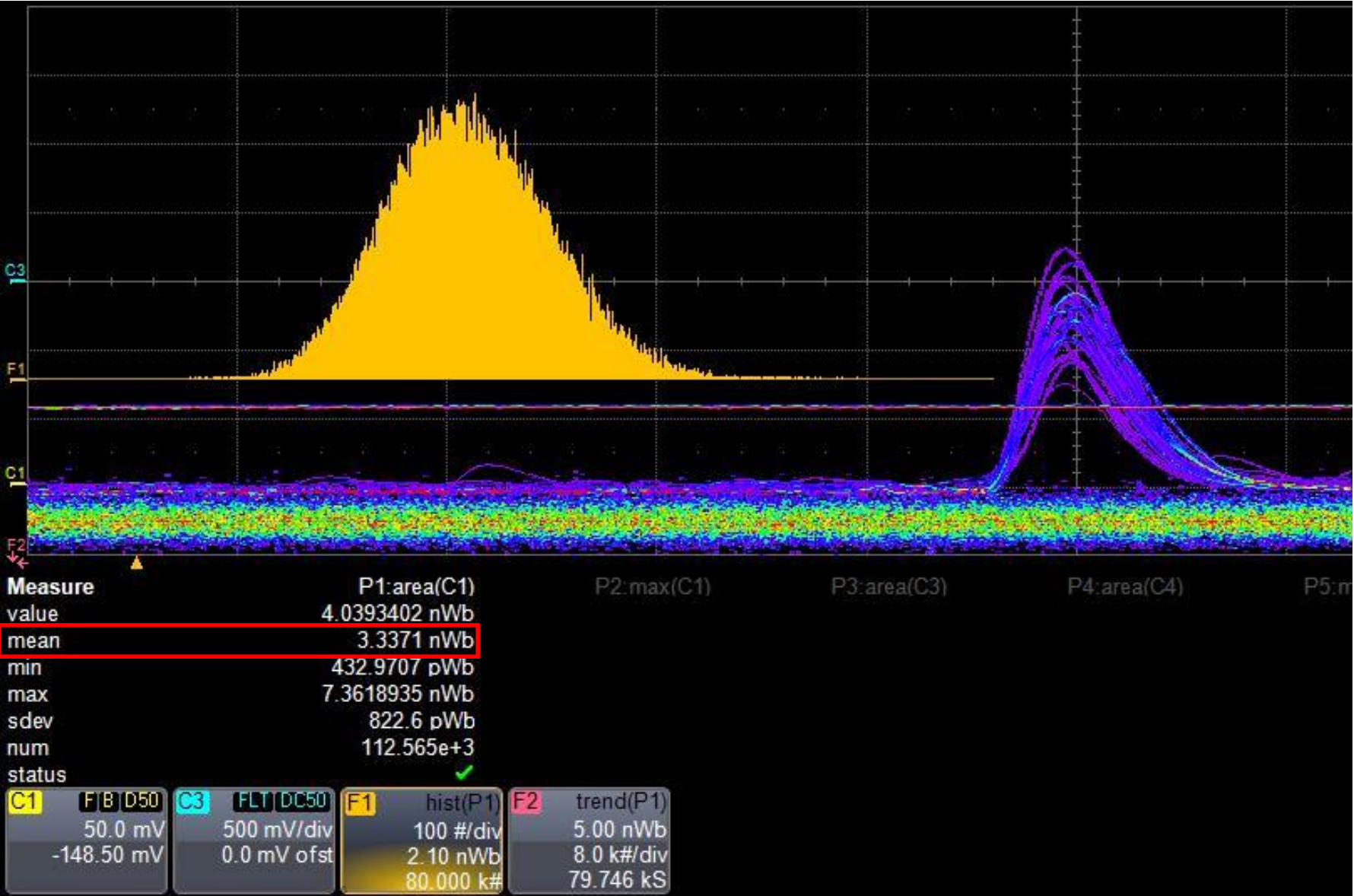
1.408pvs=1PE



BCF91A (no mirror painting)

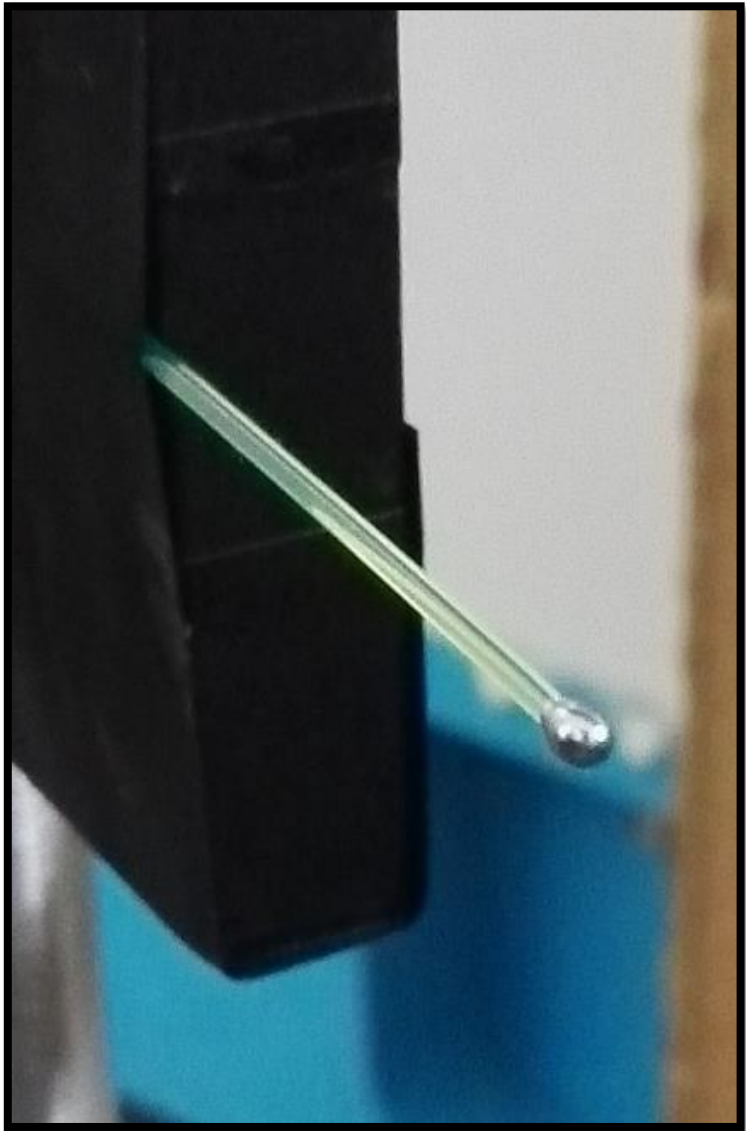
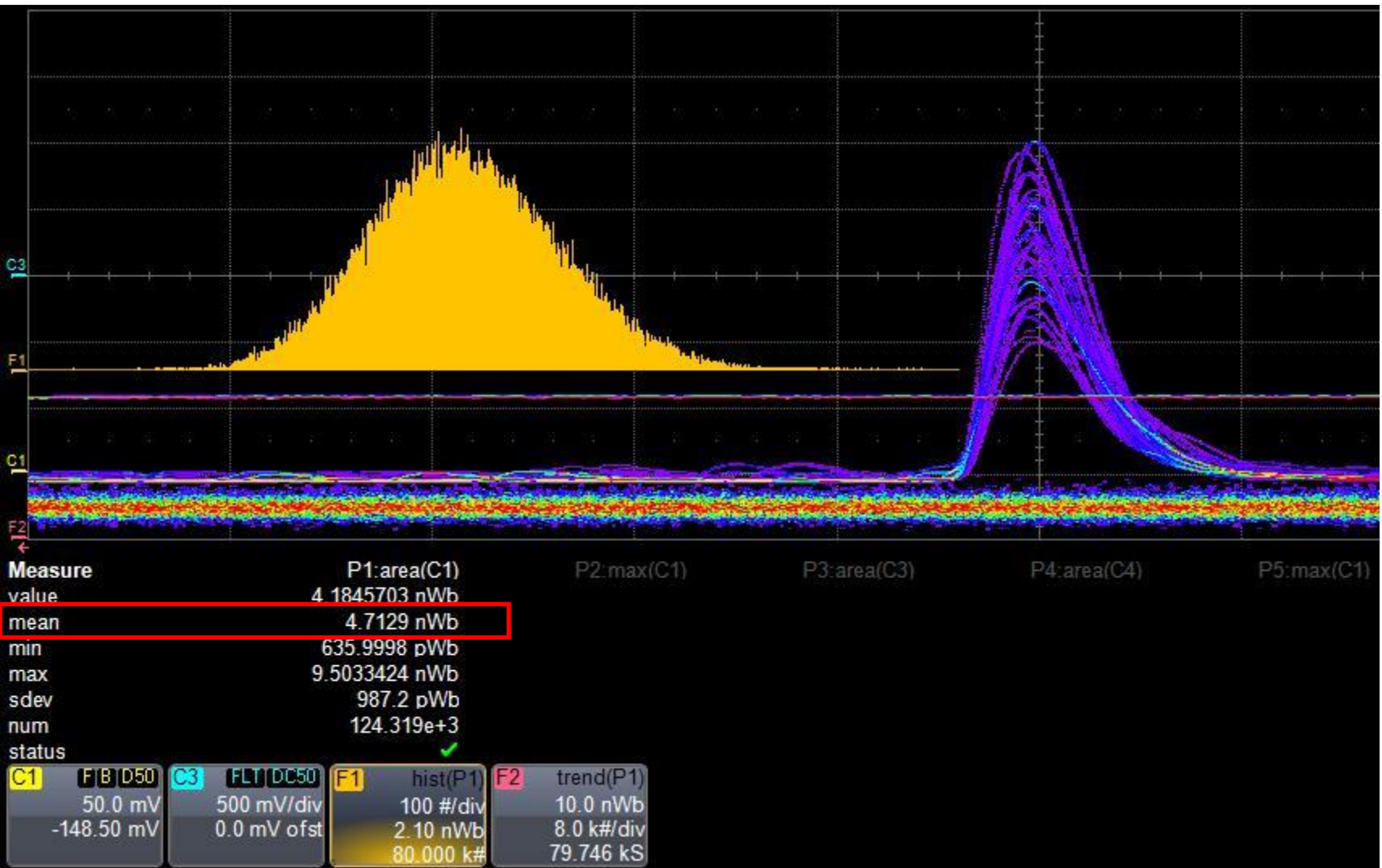
1nWb=1000pVs

$$N_{pe} = \frac{3337.1 pVs}{1.408 pVs} = 2370$$



BCF91A + silver 415001

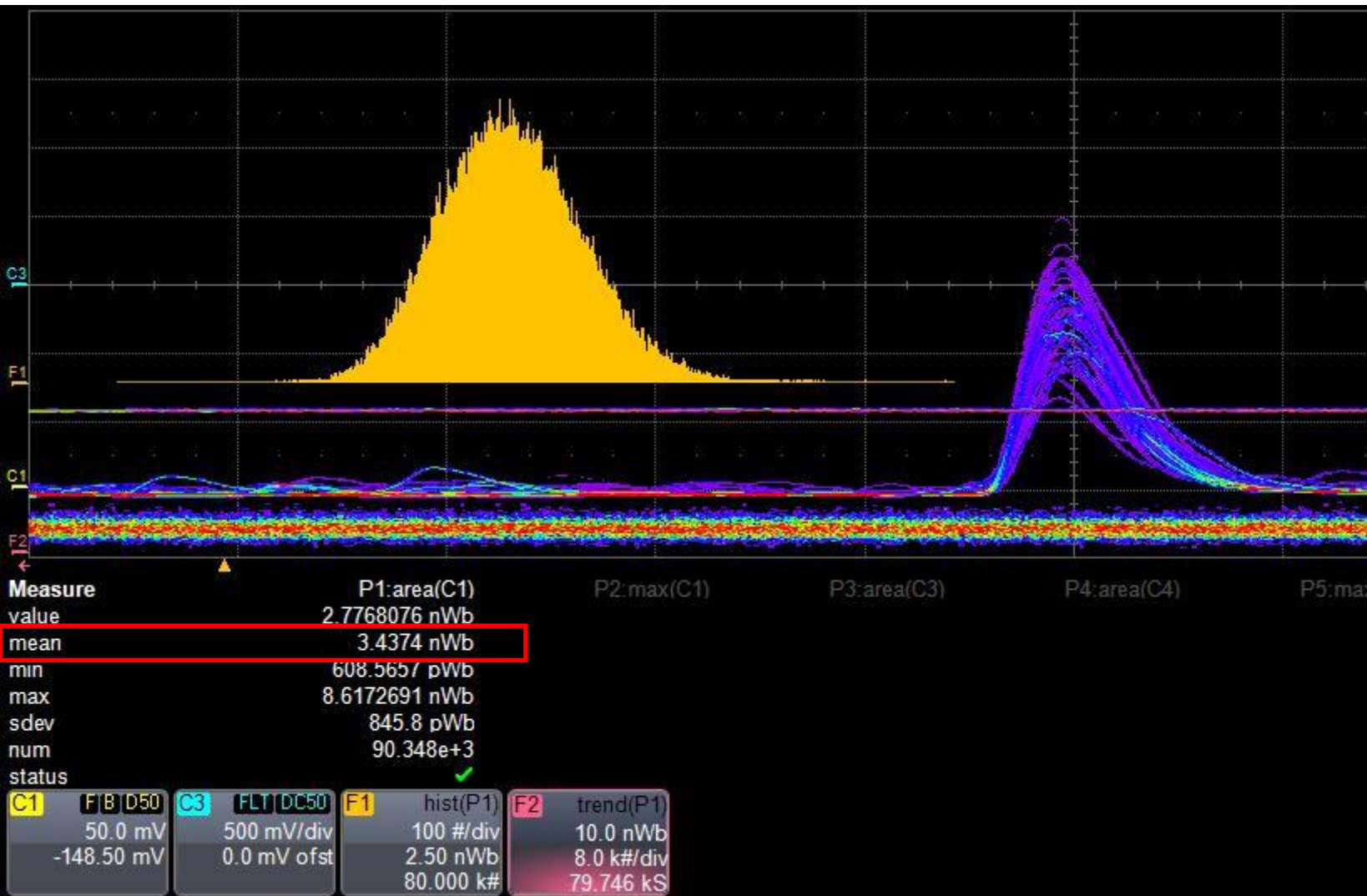
$$N_{pe} = \frac{4712.9}{1.408} = 3347$$





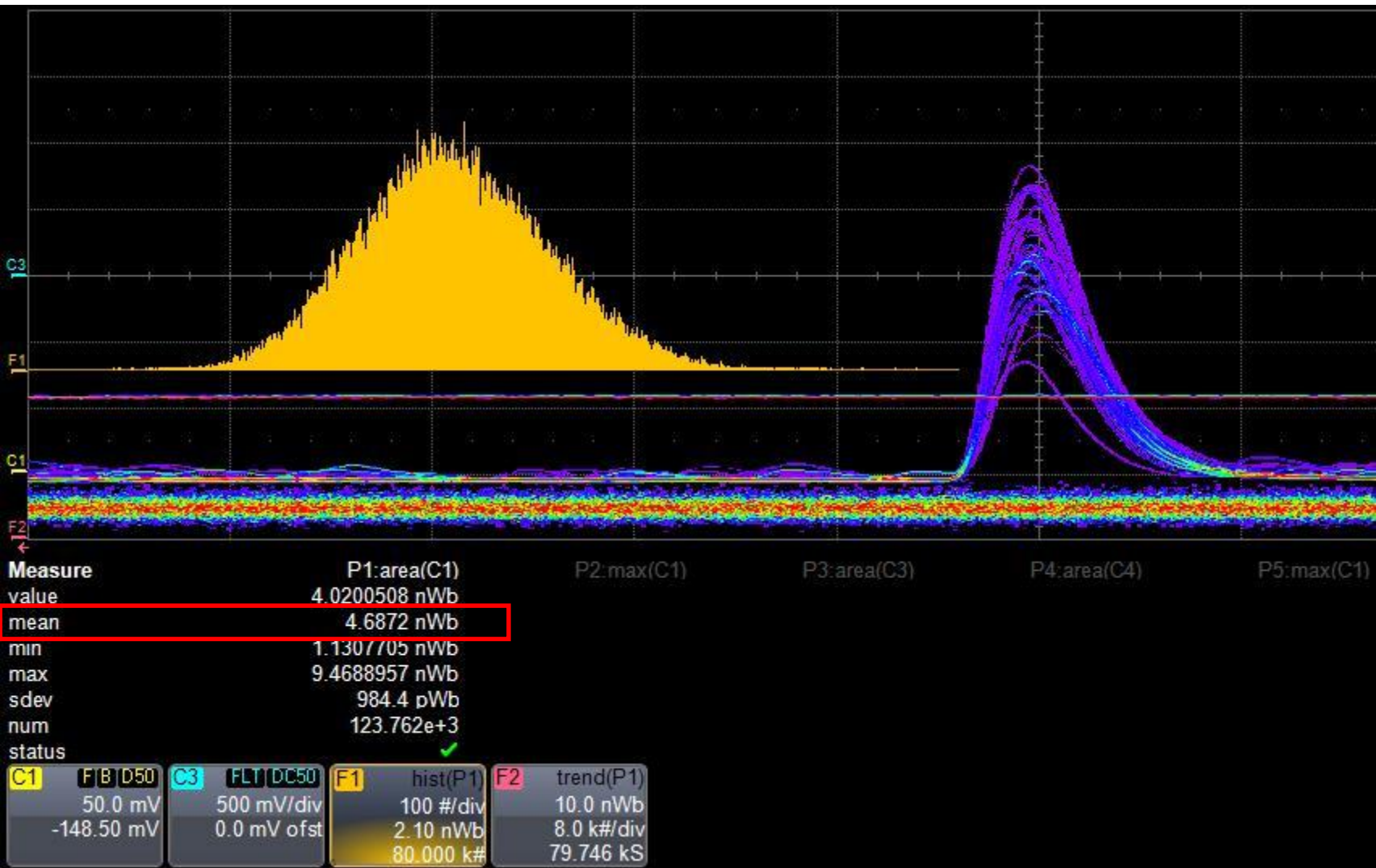
Y11 (no mirror painting)

$$N_{pe} = \frac{3437.4}{1.408} = 2441$$



Y11 + silver 415001

$$N_{pe} = \frac{3687.2}{1.408} = 3329$$



## Compared results

	BCF91A	Y11	improvement
No mirror painting	2370	2441	?
Silver 415001	3347	3329	?
improvement	41.22%	36.38%	



Y11

(maybe it is not Y11, it is BCF91A,  
please check)



BCF91A

(We buy this kind of fiber from  
SAINT-GOBAIN)