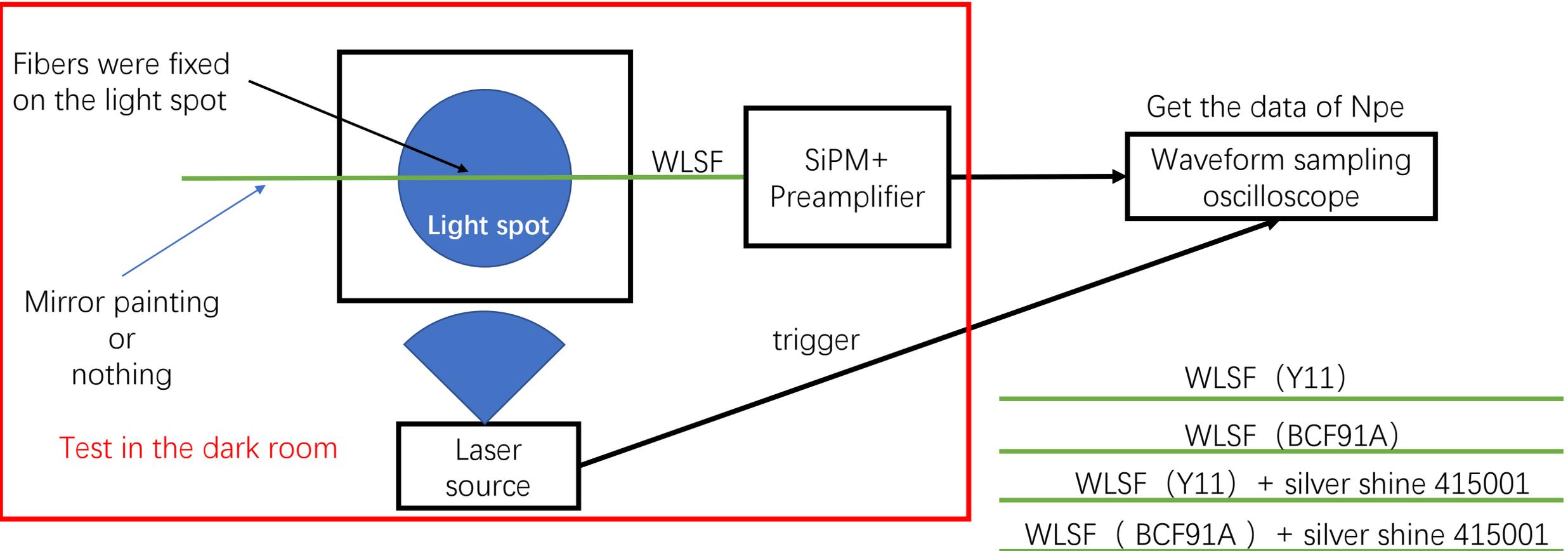


Test of two different fiber & mirror painting



For laser source:

- 420 nm
- 1 MHz

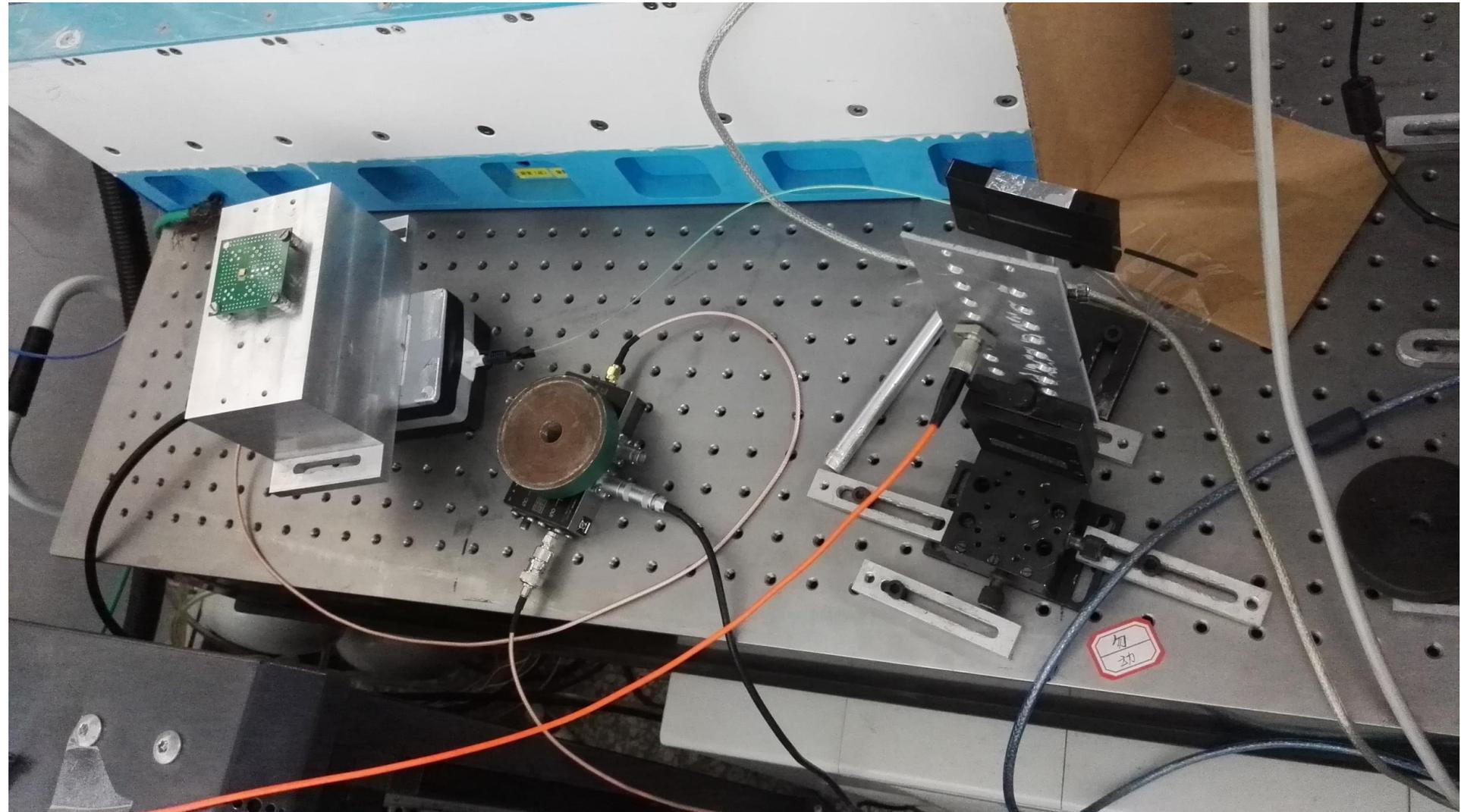
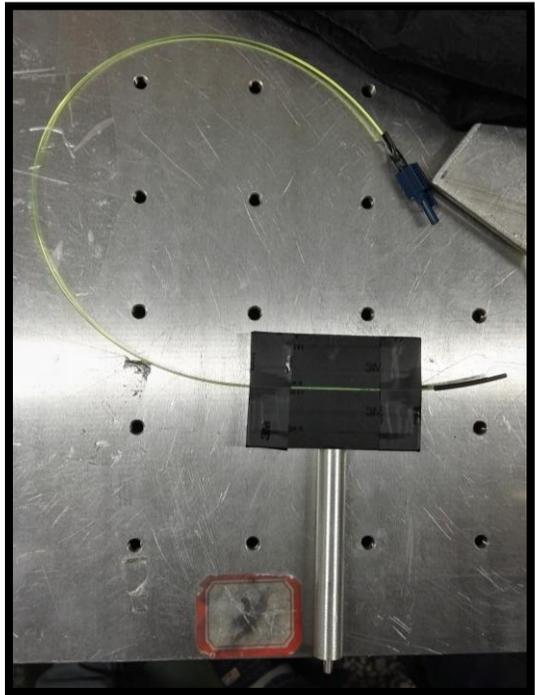
For SiPM:

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

For the fibers:

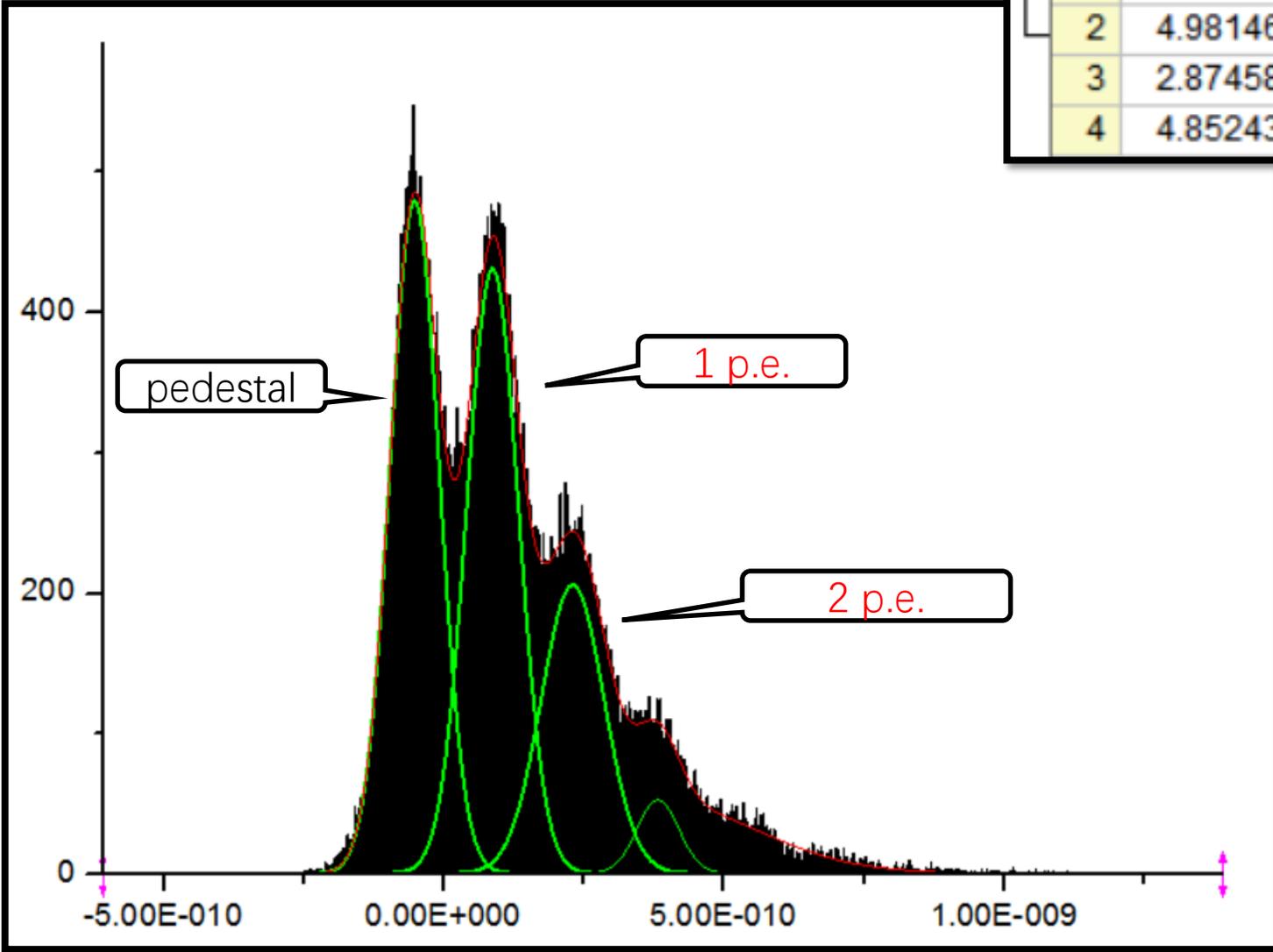
- 50 cm
- Have been polished

Set up



Gain of the SiPM (SPE)

	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

$$\begin{aligned}
 &= \frac{(\text{Center}2 - \text{Center}1) + (\text{Center}3 - \text{Center}2)}{2 \cdot 100 \cdot R \cdot e} \\
 &= \frac{1.408 \text{ pvs}}{100 \cdot R \cdot e} = 1.76 \times 10^5
 \end{aligned}$$

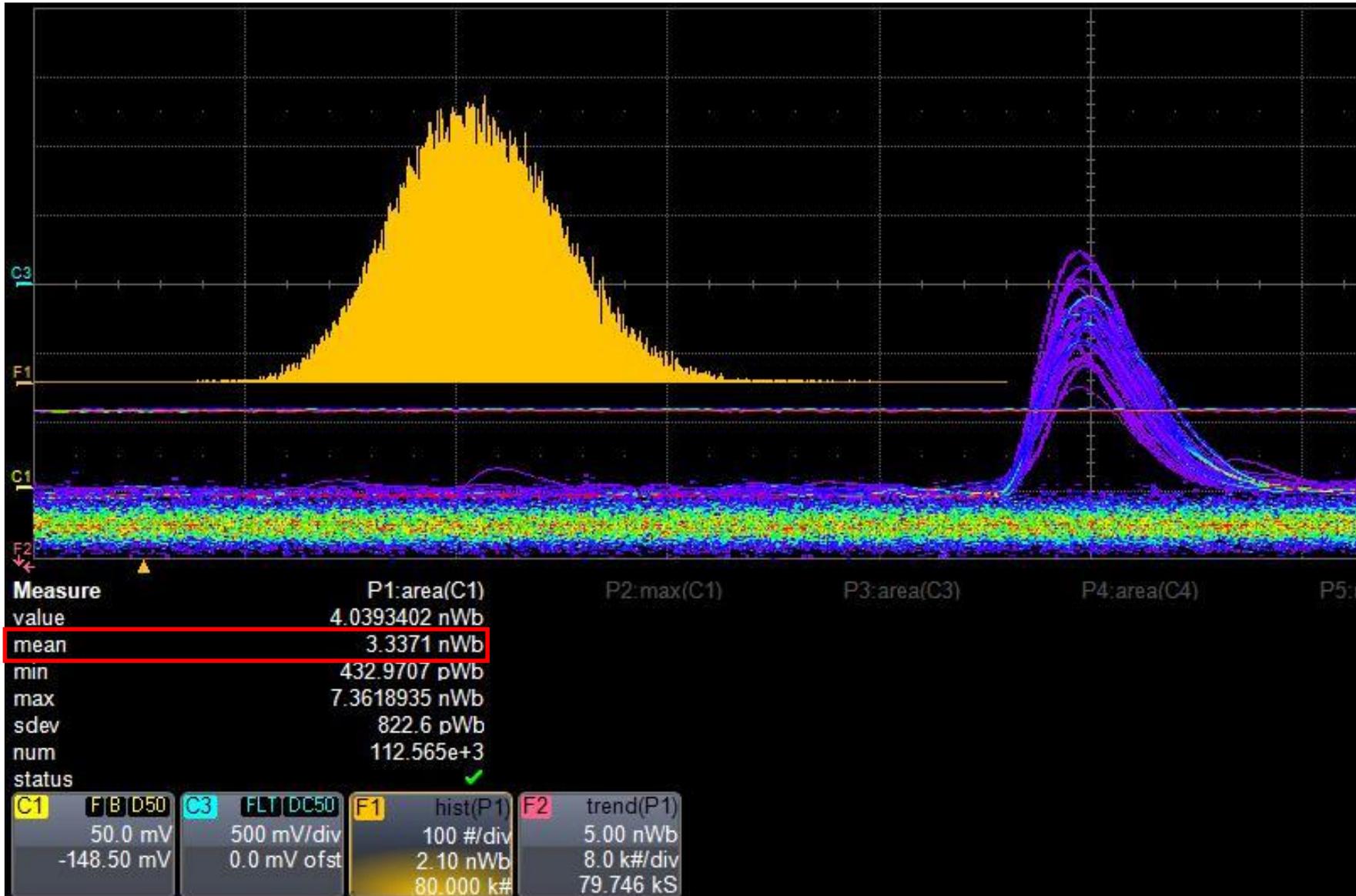
Preamplifier 50Ω for oscilloscope

1.408 pvs = 1PE

BCF91A (no mirror painting)

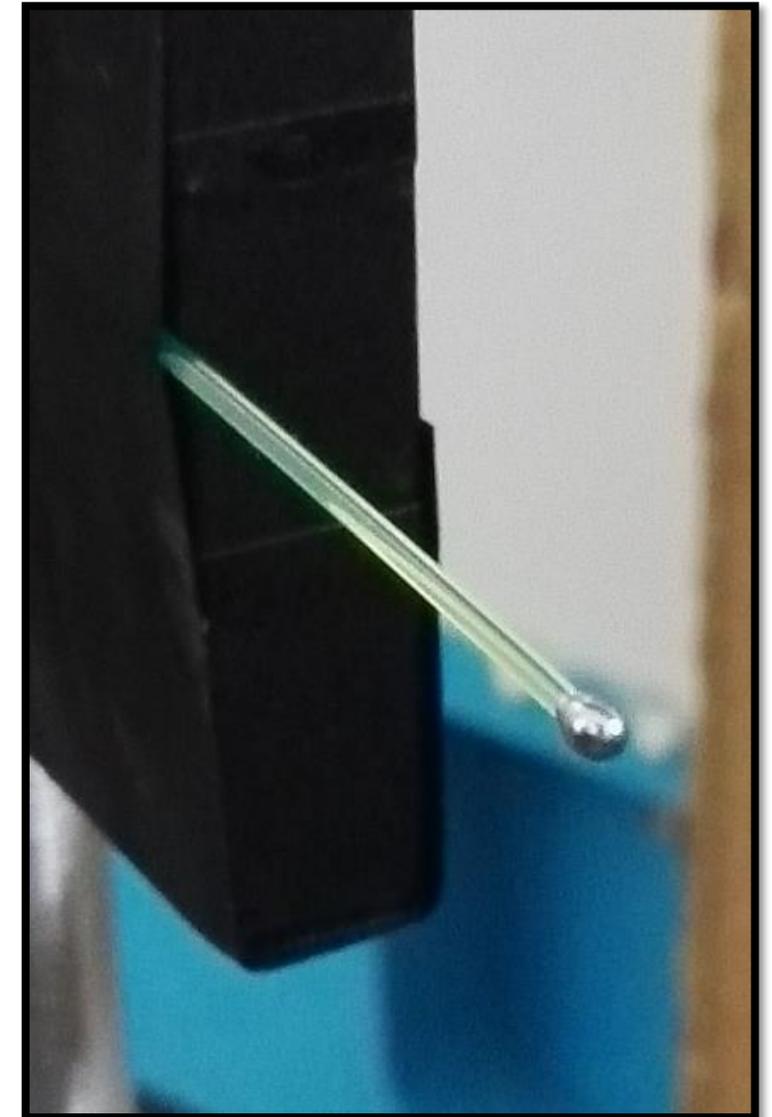
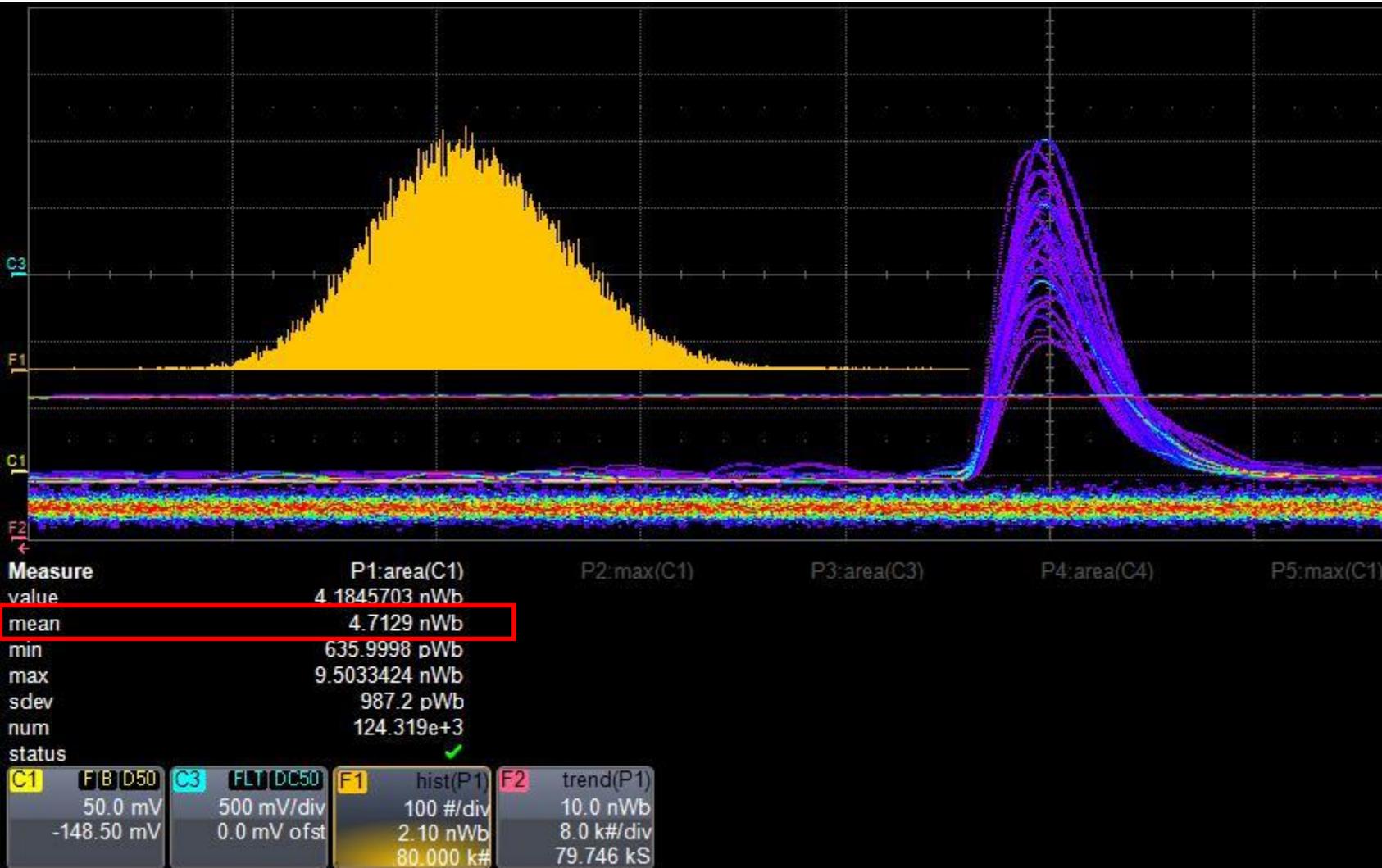
1nWb=1000pVs

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



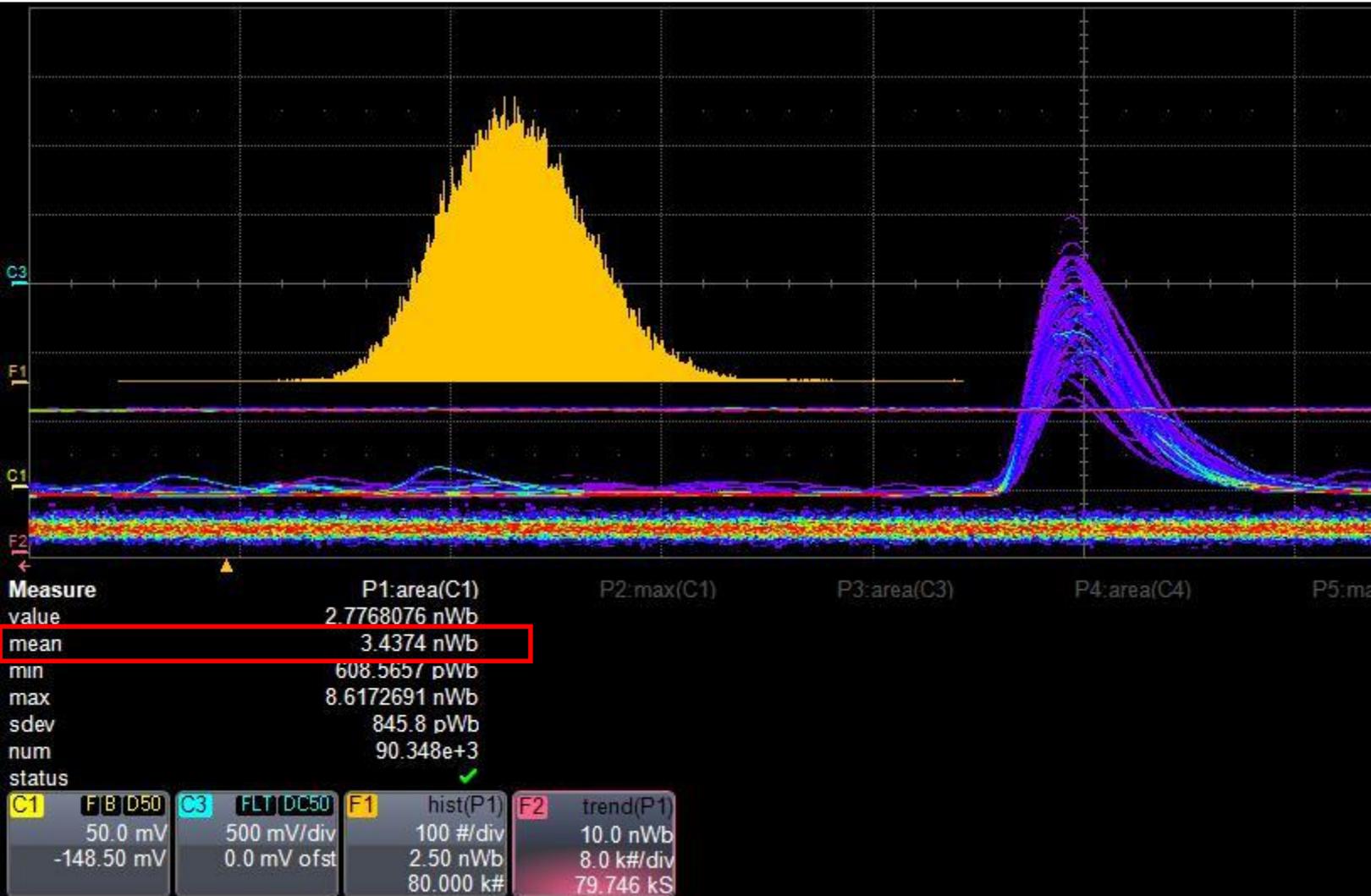
BCF91A + silver 415001

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



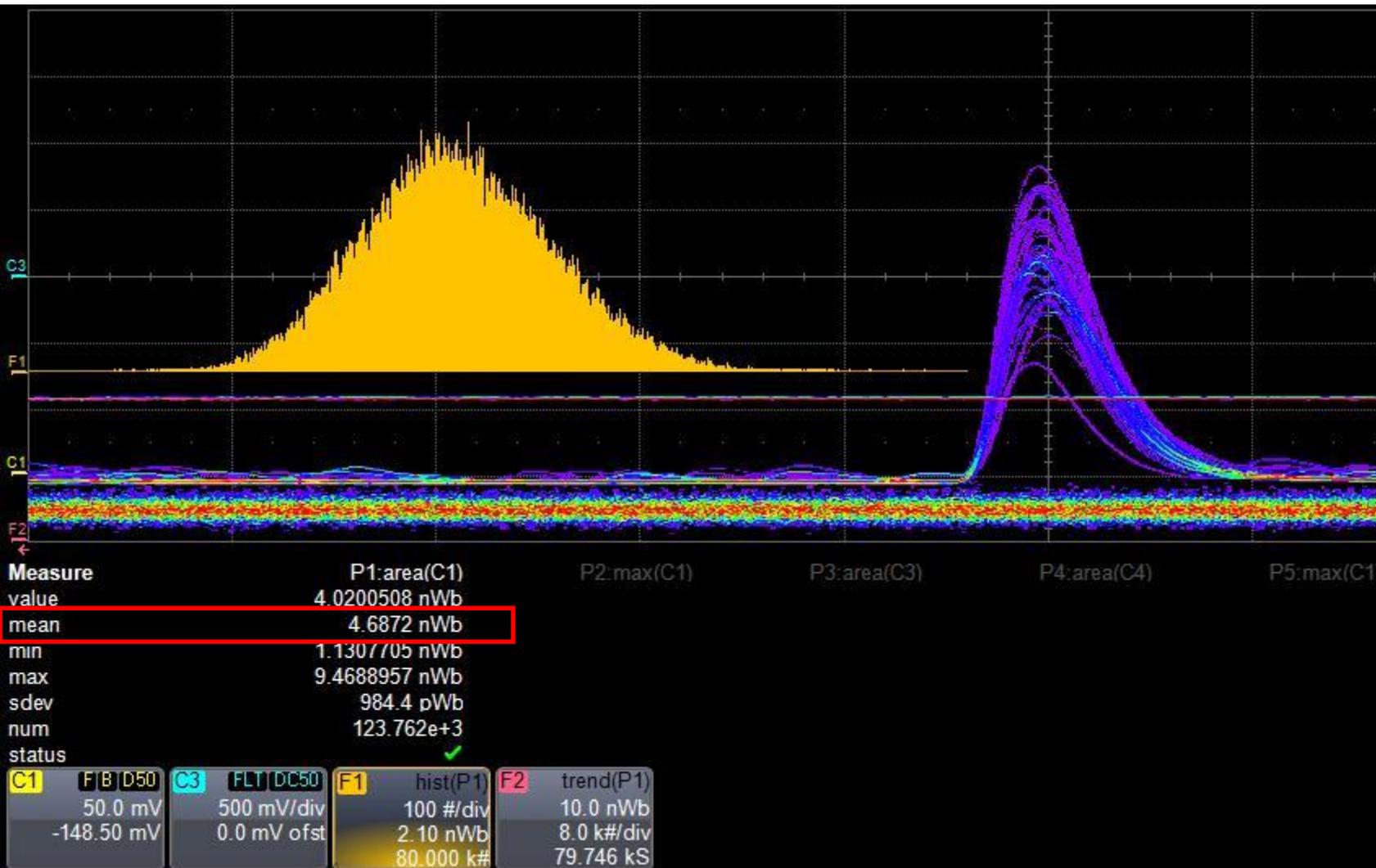
Y11 (no mirror painting)

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



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)