

Updates on HRPPD #25 activities

Ageing studies - Global Meet
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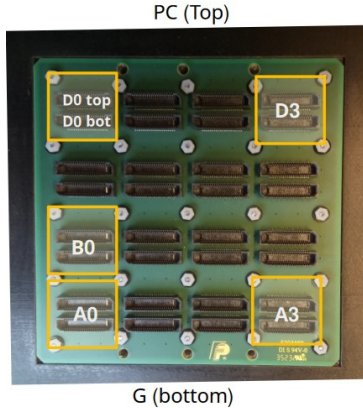
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Outline

- Dark Count Rate scan (32 pads)
- Digitizer data acquisition
- QE measurement strategy
- Ageing studies – measurement setup

Dark Count Rates



- Good light-tight
- HV: -200_-700_-200_-700_-200 V (ROP)
- Without amplifier
- CAEN Discriminator (N417), CAEN Scalar (N145)
- 4 x 8 Pads from A0Top

Two measurements per pad x 3 Th. values
(6 mV, 10 mV, 20 mV)

An example (Th 6 mV):

I. 3079/50 sec

II. 3137/50 sec

$6216/100 \text{ sec} \cdot 0.09 \text{ cm}^2$ $3 \times 3 \text{ mm}^2 \text{ pad}$
error = $\sqrt{6216}$

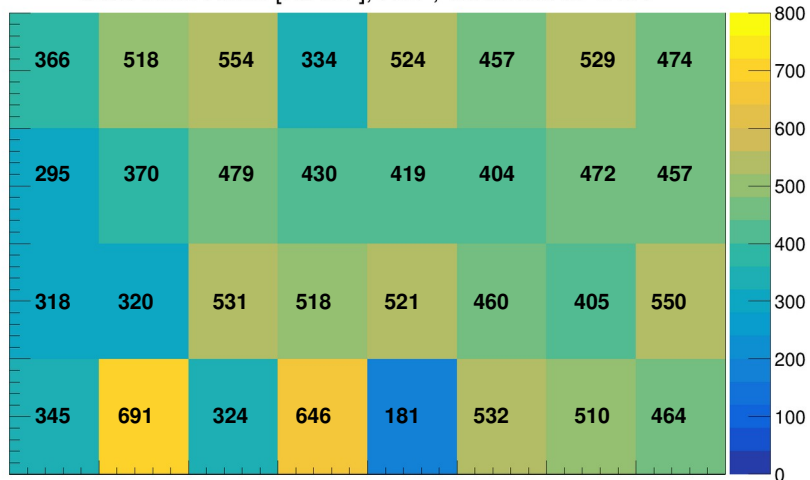
$691 \pm 8 \text{ Hz/cm}^2$

A0 TOP

37	27	33	?	19	14	11	9
34	39	29	24	20	13	3	10
30	40	31	21	17	7	4	1
38	28	32	22	?	8	12	2
2	12	8	18	22	32	28	38
1	4	7	17	21	31	40	37
10	3	13	20	24	29	39	34
9	11	14	19	23	30	27	33

Dark Count Rates

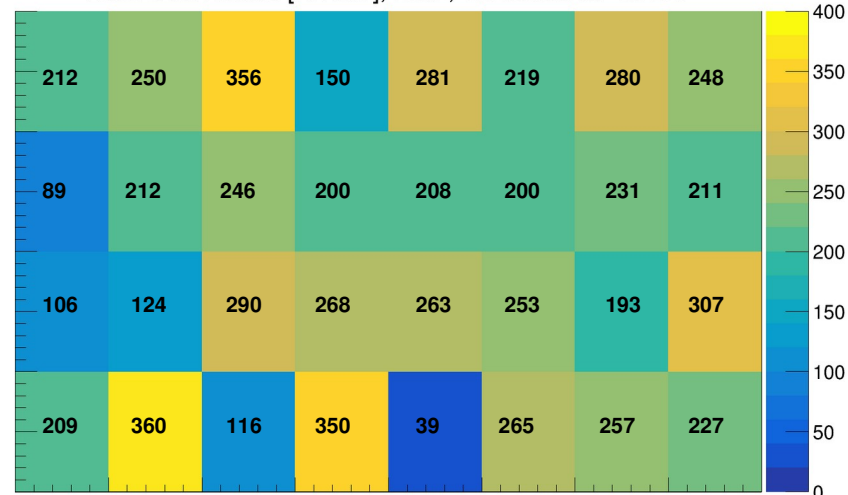
Dark Coun Rates [Hz/cm²], ROP, Threshold at -6 mV



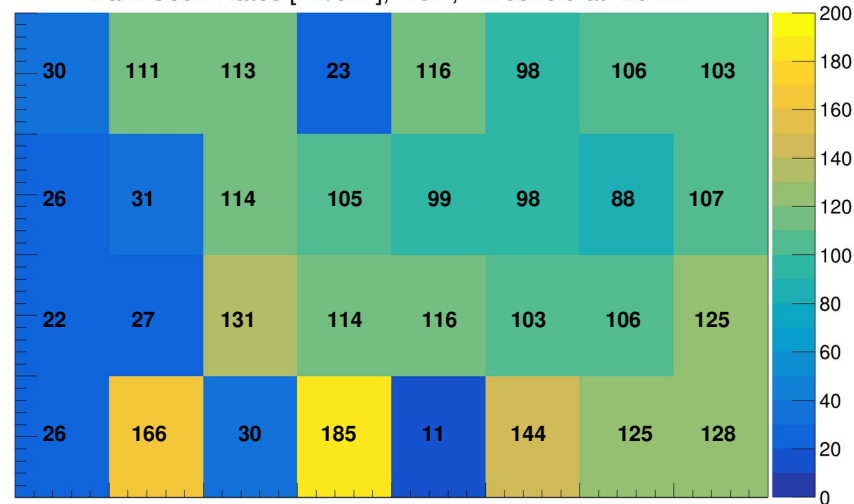
37	27	33	?	19	14	11	9
34	39	29	24	20	13	3	10
30	40	31	21	17	7	4	1
38	28	32	22	?	8	12	2

? → 23, 18

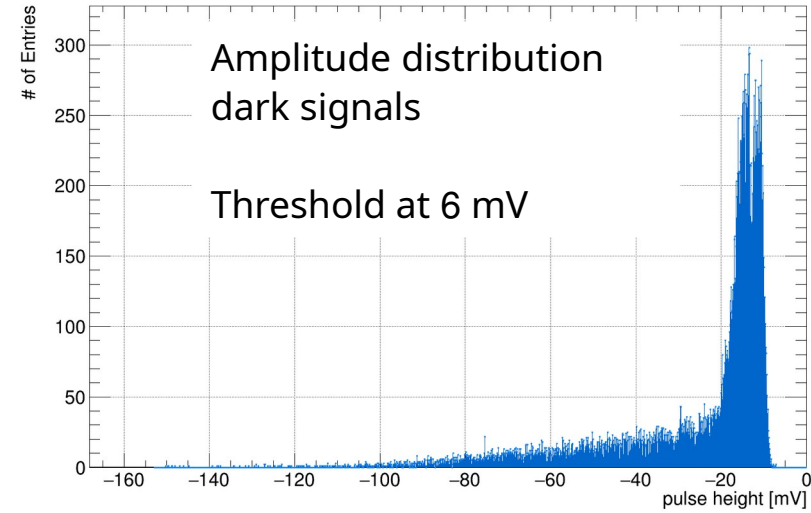
Dark Coun Rates [Hz/cm²], ROP, Threshold at -10 mV



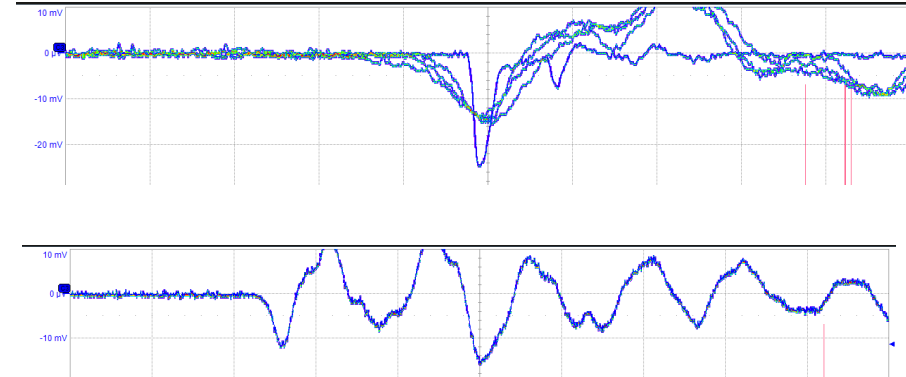
Dark Coun Rates [Hz/cm²], ROP, Threshold at -20 mV



Dark Count Rates

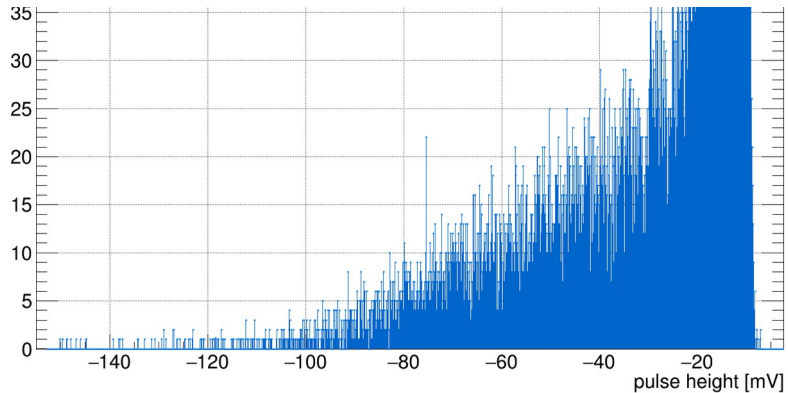
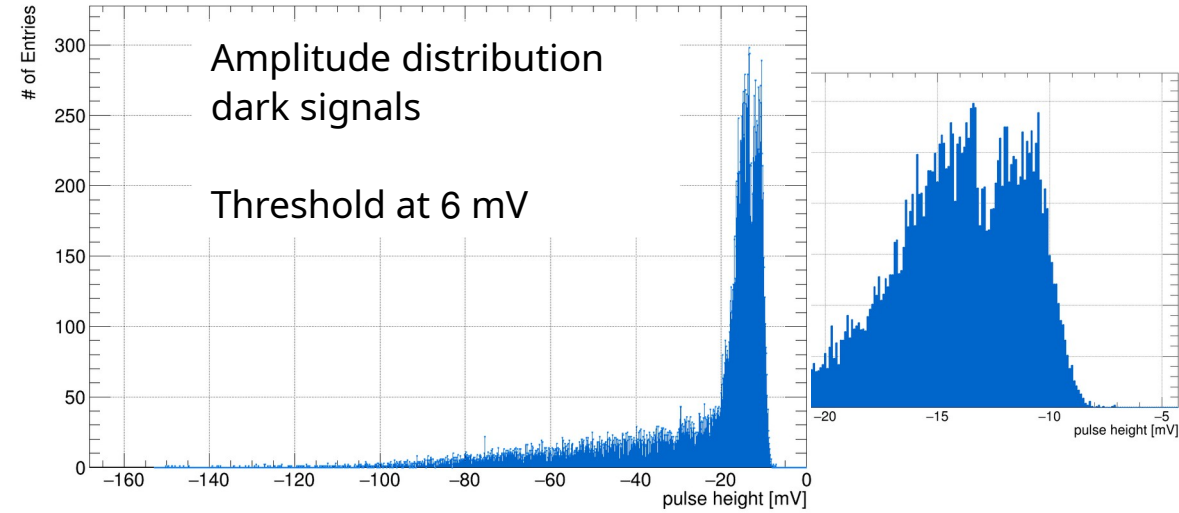


Fraction of dark signals have some patterns
that are common to several pads

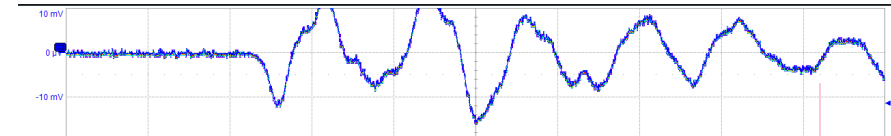
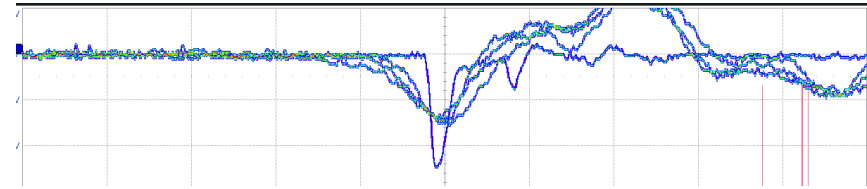


Crosstalk measurements will be performed

Dark Count Rates



Fraction of dark signals have some patterns
that are common to several pads



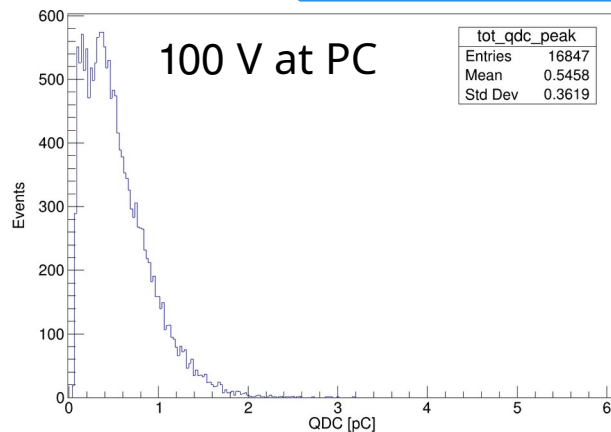
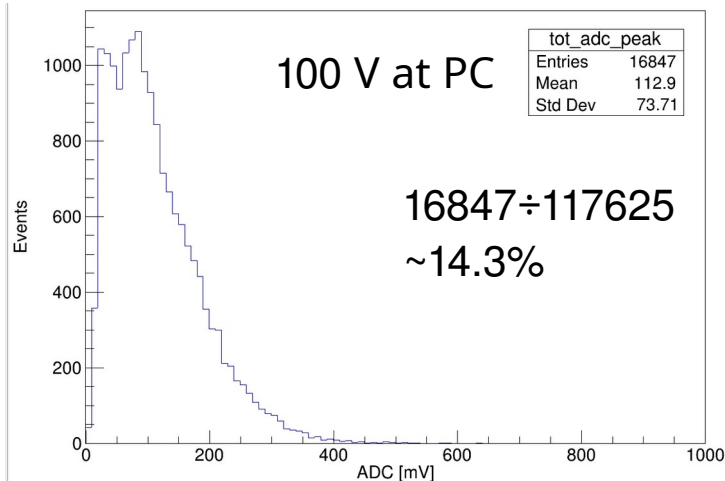
Crosstalk measurements will be performed

Data acquisition with digitizer

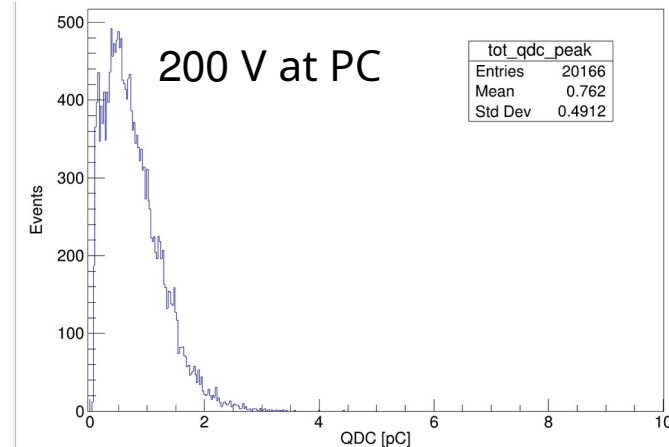
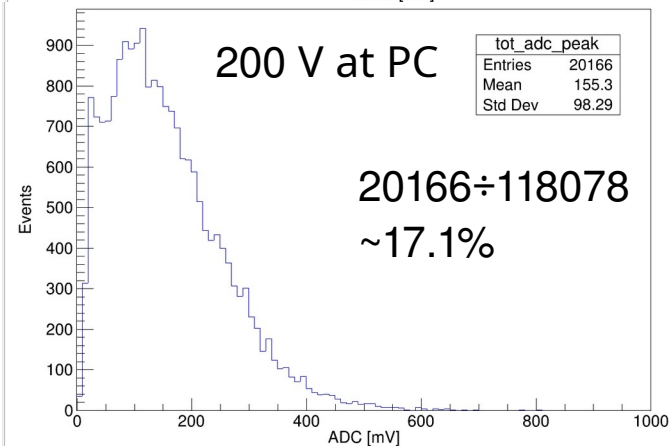
HV: -200_-650_-200_-650_ ΔV

Trigger on Sync pulse

Int. 2.0; With amplifier + 1 k Ω resistor; Pin #12A0Top

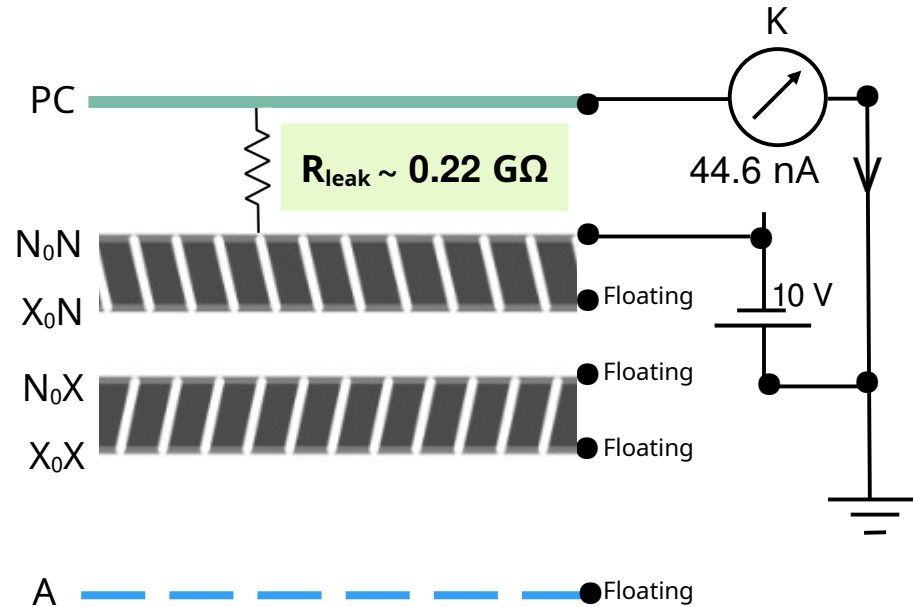


→ WaveDump Codes
working fine



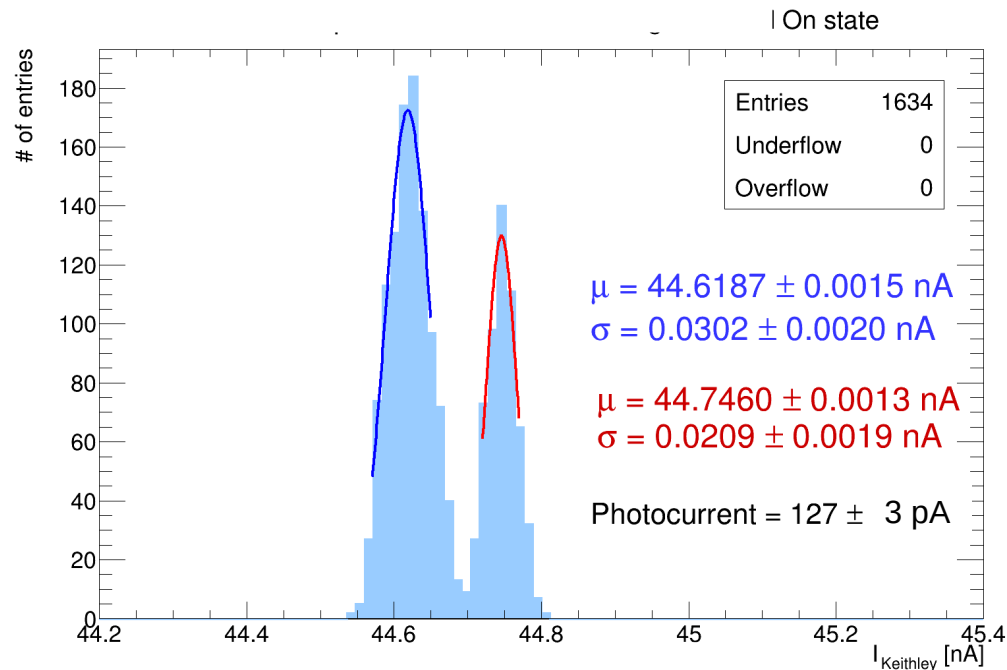
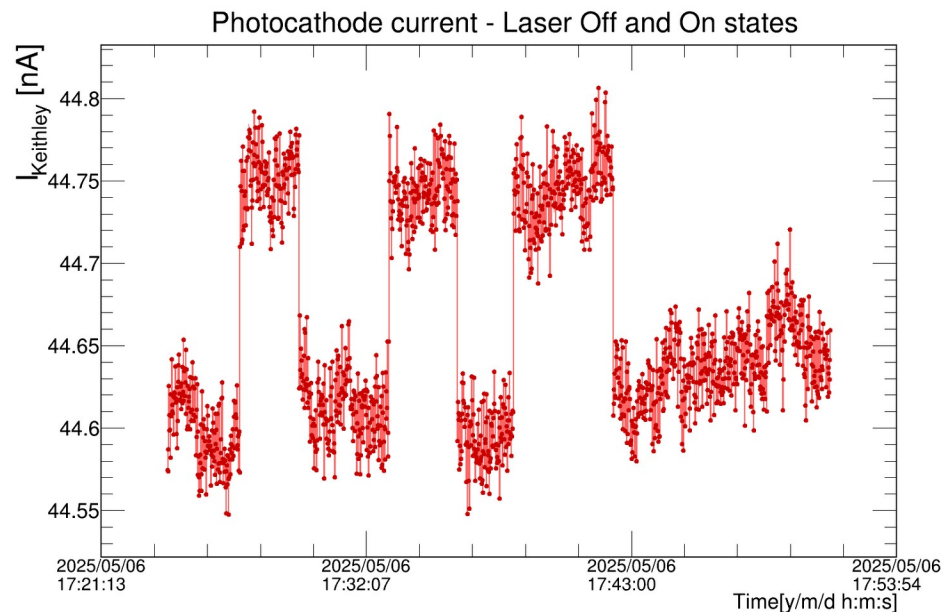
QE measurements

Measurement of Photo-current



QE measurements

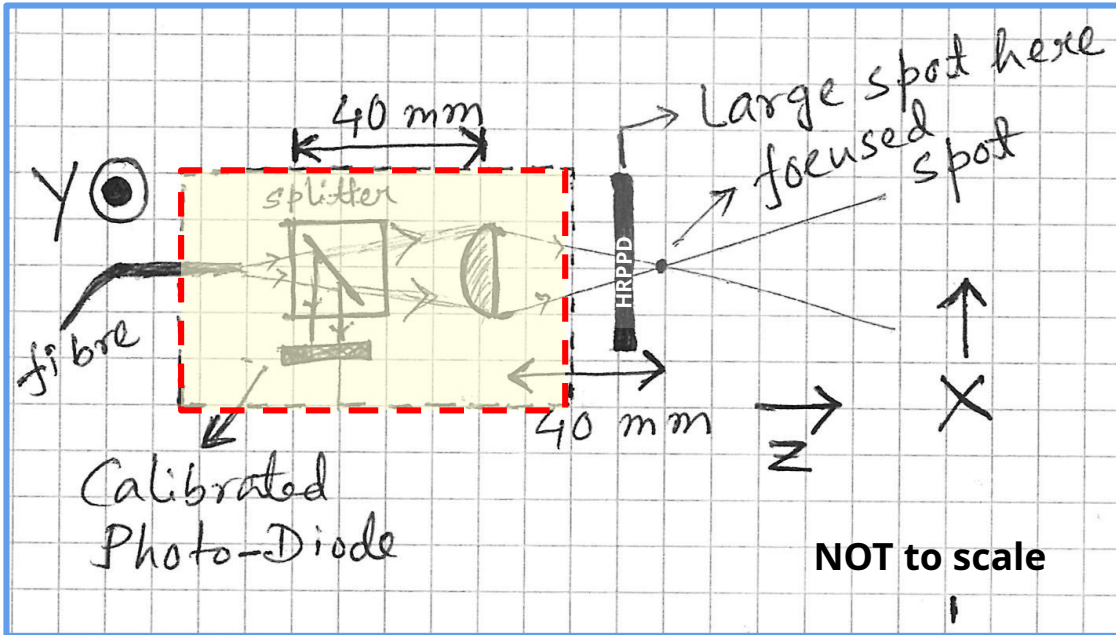
Light On state: Intensity 3.5 (~25 p.e.), Internal Trigger 40 MHz
NoN at +10 V



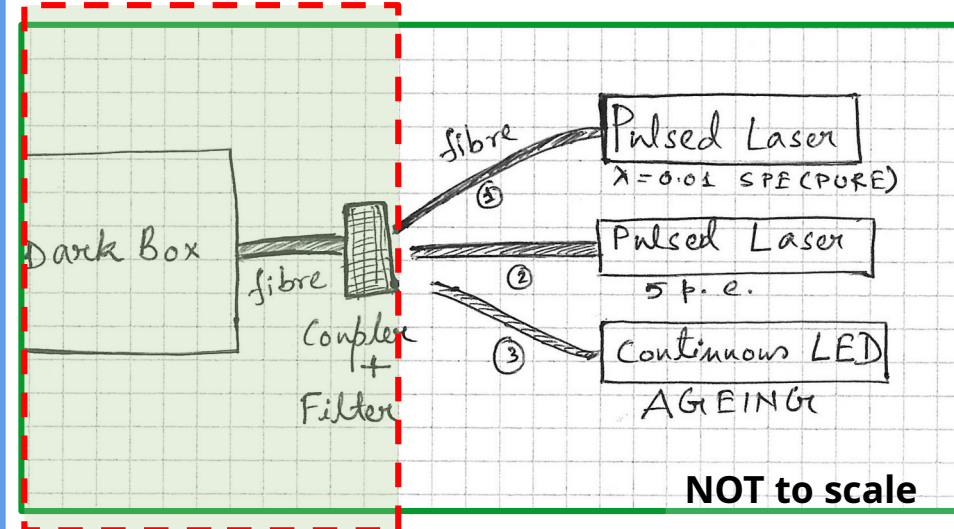
$8 \times 10^8 \text{ p.e./sec}$

Ageing study – measurement setup

Optics inside dark box (Top view)



Optics outside dark box
3 configurations



Area inside dotted lines mounted on moving system

Spot size in Z

Window XY plane

Conclusion

- Dark count rates have been measured for 32 pad for different threshold values
- Digitizer software updated and working
- QE measurement strategy
- We are defining the measurement setup and protocol for the ageing studies in detail