

# Updates on Optics HRPPD #25

Ageing studies - Global Meet  
18 June 2025

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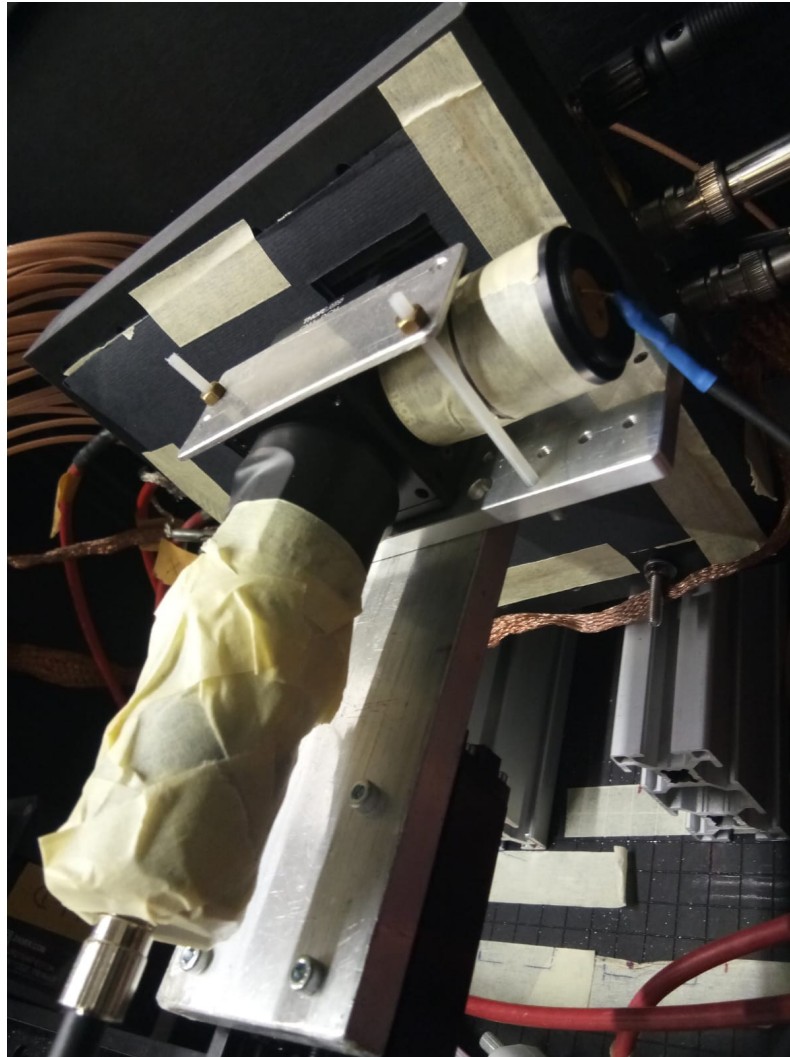
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# Outline

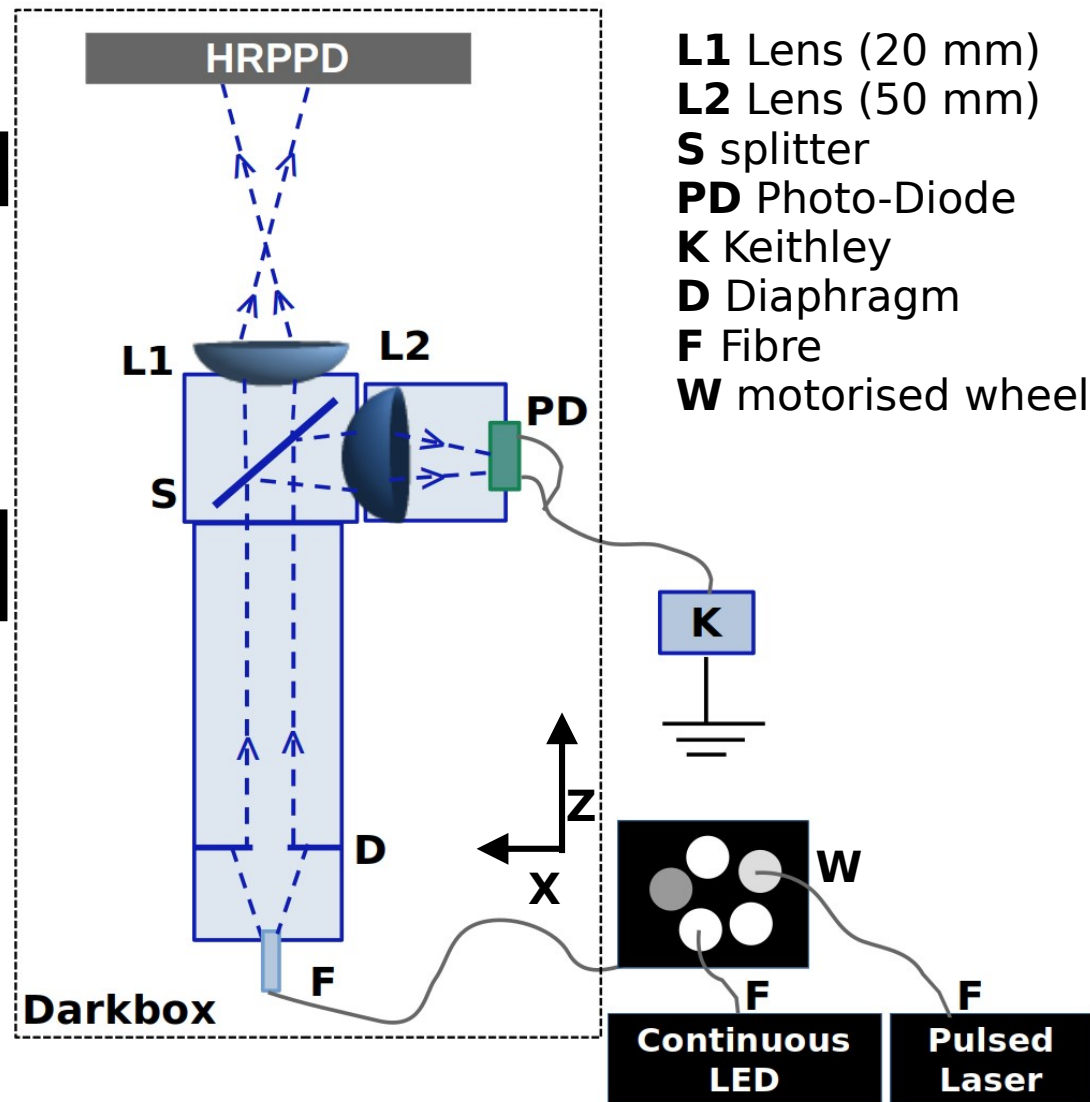
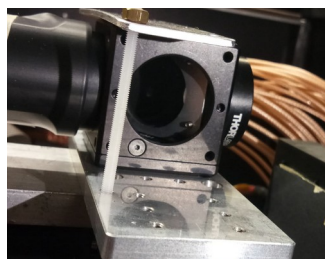
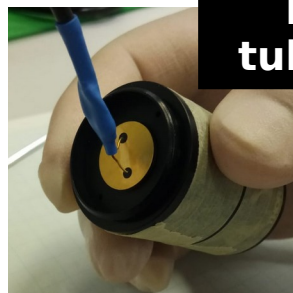
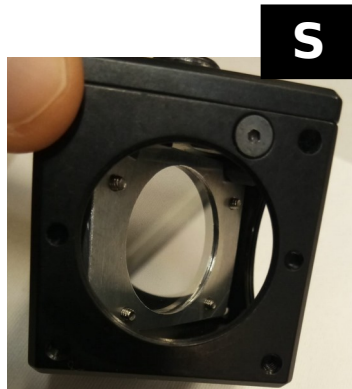
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- Optics set-up
- Five optics configurations
- Splitting ratio of the splitter

# Optics set-up

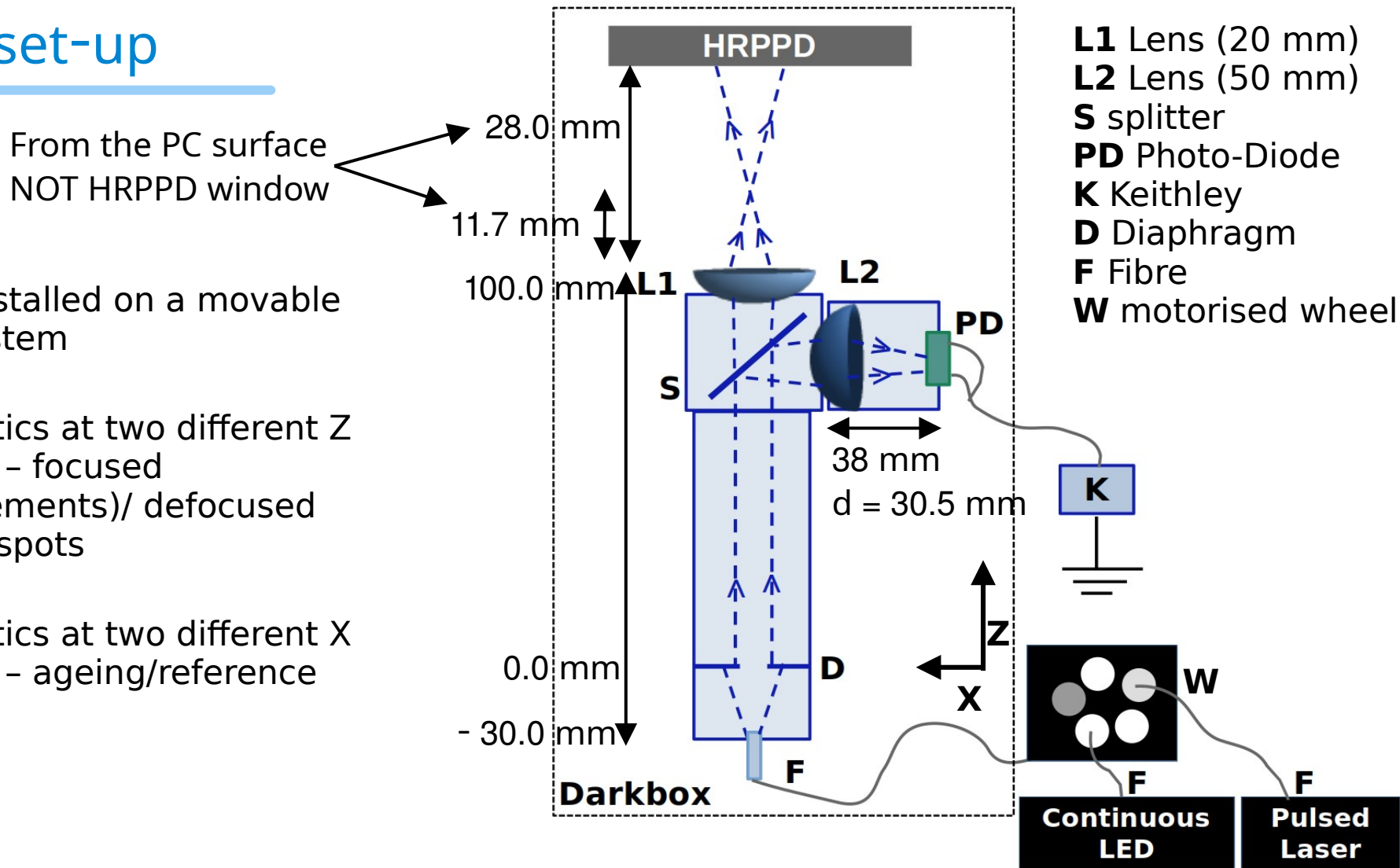


# Optics set-up



# Optics set-up

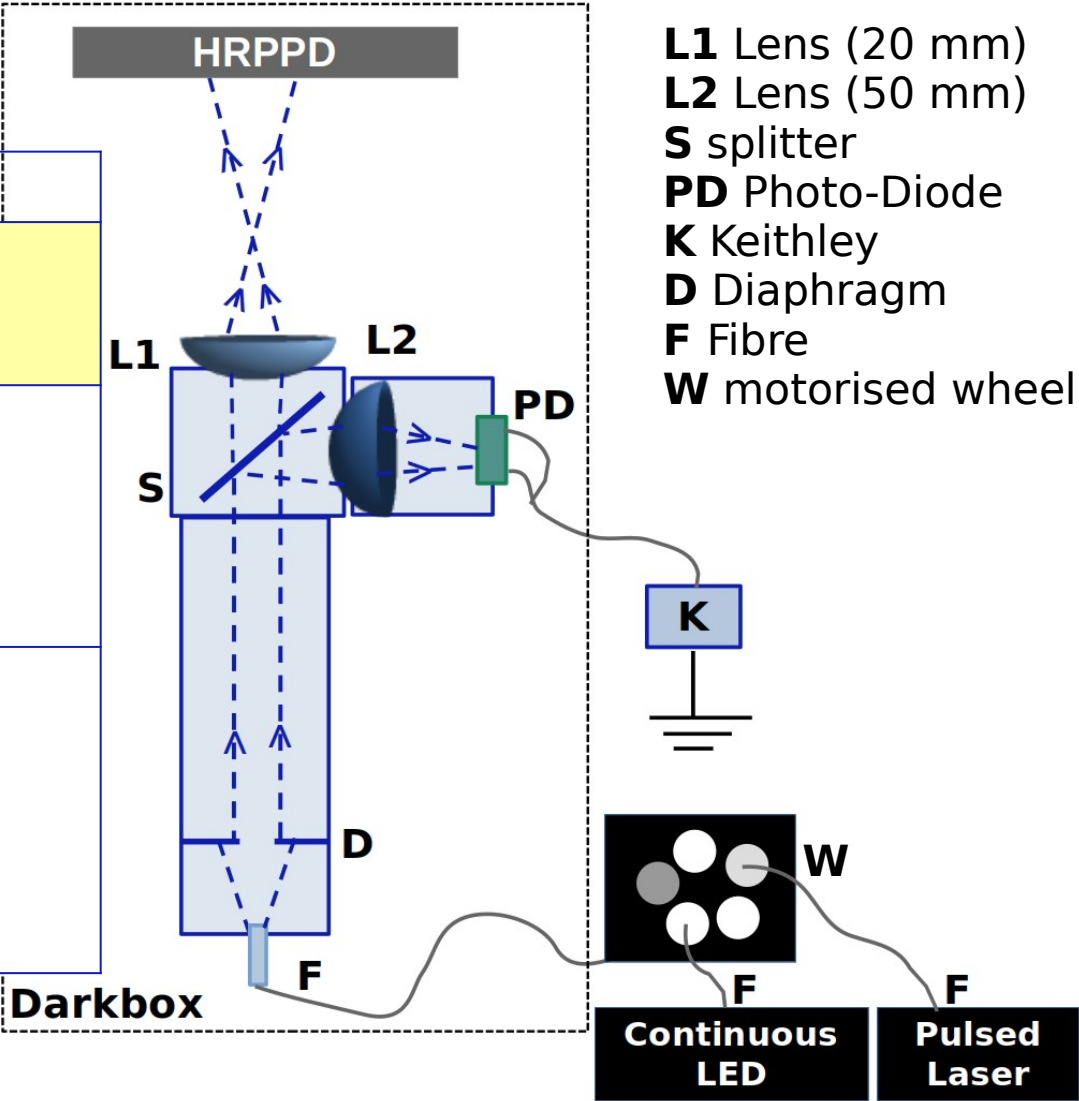
- Optics installed on a movable (XYZ) system
- Same optics at two different Z positions – focused (measurements)/ defocused (ageing) spots
- Same optics at two different X positions – ageing/reference spots



# Five optics configuration

Five configurations

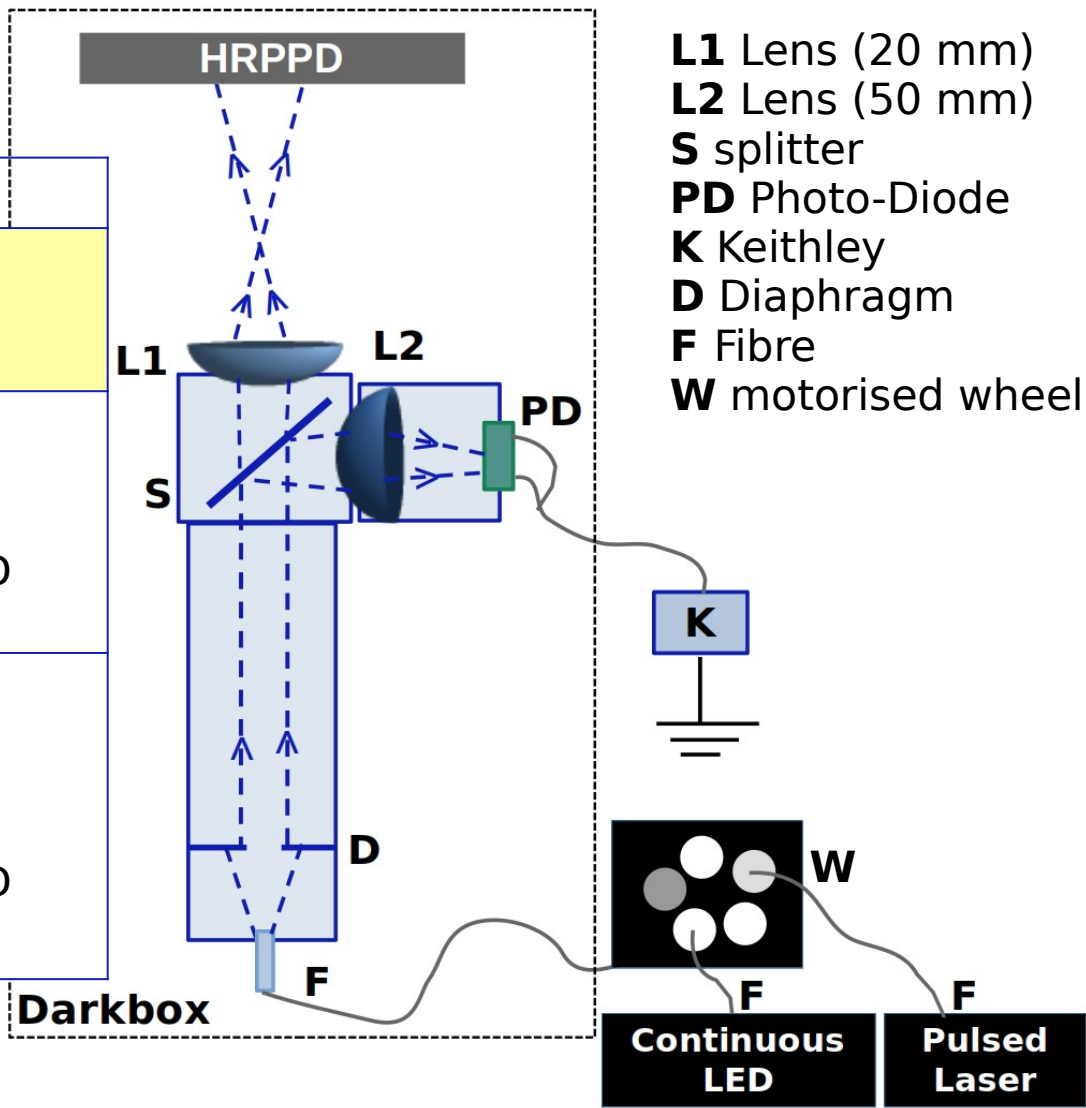
Pulsed Laser + ND filters in wheel	Continuous LED
1% Pure SPE ( $\lambda=0.01$ ) <b>measurements</b>	Direct for <b>QE</b>
15% SPE ( $\lambda=0.15$ ) <b>measurements</b>	Via wheel (empty) <b>Ageing</b>
3 PE ( $\lambda=5$ ) <b>measurements</b>	



# Five optics configuration

Five configurations

Pulsed Laser (Int.9.0,40MHz) + ND filters in wheel	Continuous LED
1% Pure SPE ( $\lambda=0.01$ ) <b>measurements</b>  PD(R) = 0.15 pA	Direct for <b>QE</b> PD(R)=3 nA @ LED $I_{SET}$ = 16 mA (min) PD(R)=191 nA @ LED $I_{SET}$ = 500 mA (max)
15% SPE ( $\lambda=0.15$ ) <b>measurements</b> PD(R) = 2.3 pA	Via wheel (empty) <b>Ageing</b> PD(R)=2 pA @ LED $I_{SET}$ = 16 mA (min) PD(R)=116 pA @ LED $I_{SET}$ = 500 mA (max)
3 PE ( $\lambda=5$ ) <b>measurements</b> PD(R) = 60 pA	



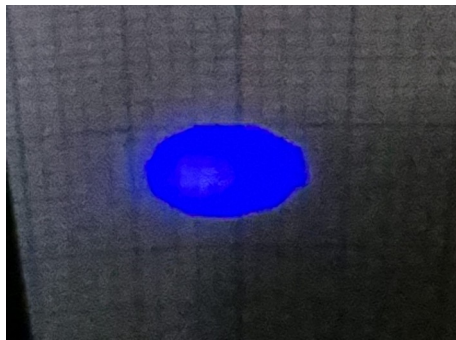


# Spot size



$r \sim 0.3 \text{ mm}$

10 mm from optics edge



$r \sim 4.9 \text{ mm}$   
 $S = 0.75 \text{ cm}^2$

20 mm from optics edge

Spot of on the Photocathode:

5 mm window thickness and its refractive index (1.47) at 405 nm had been taken into account

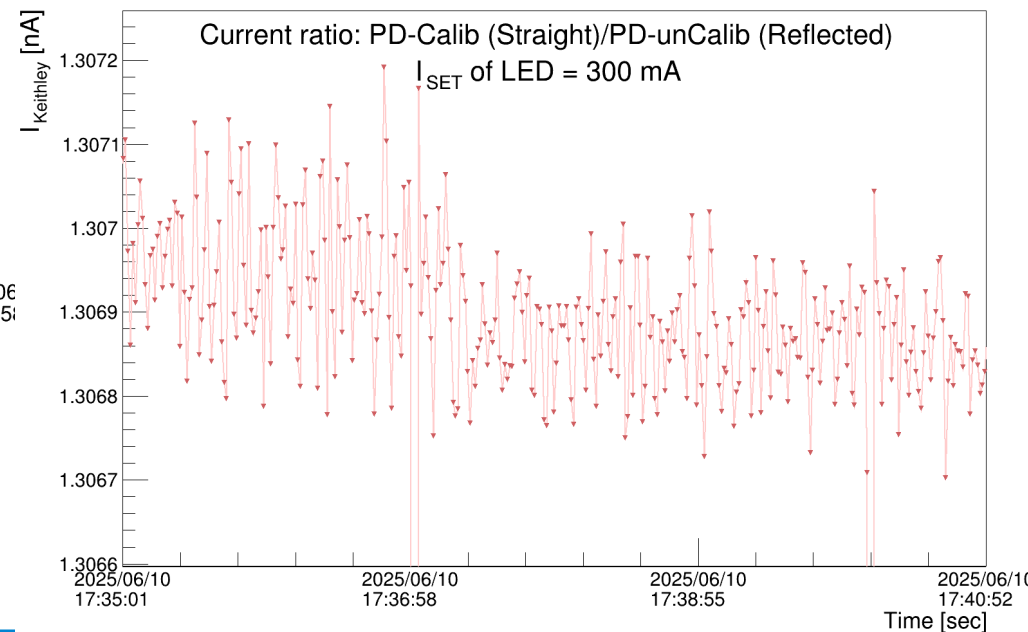
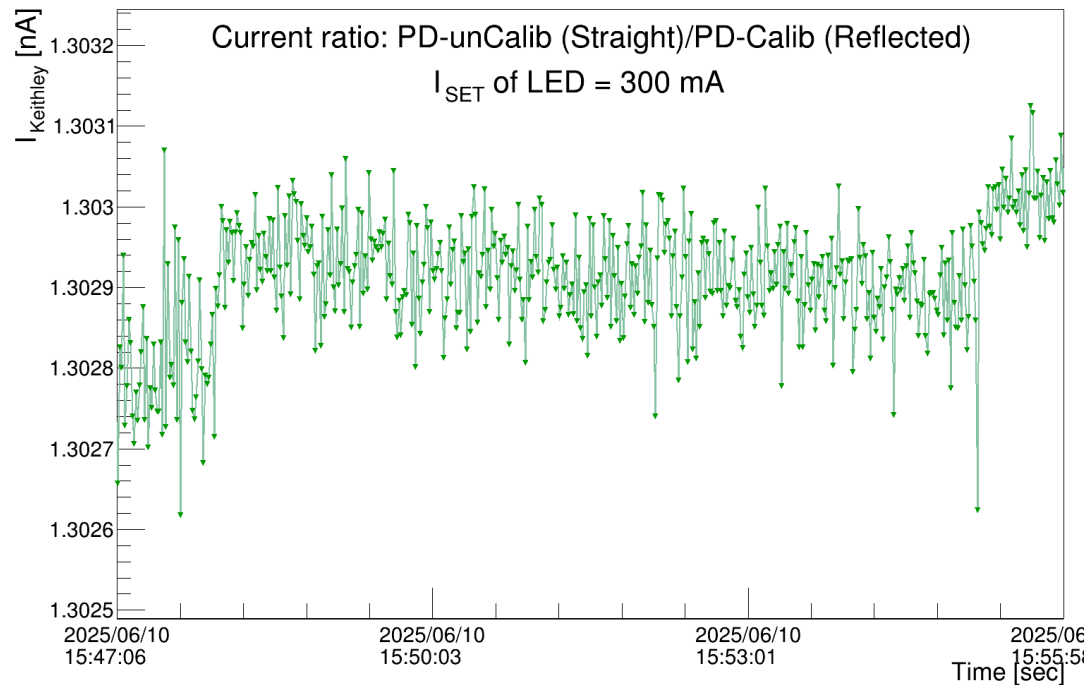
Corrected distance from the optics edge to PC

11.8 mm

28.0 mm



# SR of the splitter



SR (Straight/Reflected):

1.30296

1.30690

3% higher QE of the Calib PD

# Splitting Ratio

