RIPTIDE

April 2025

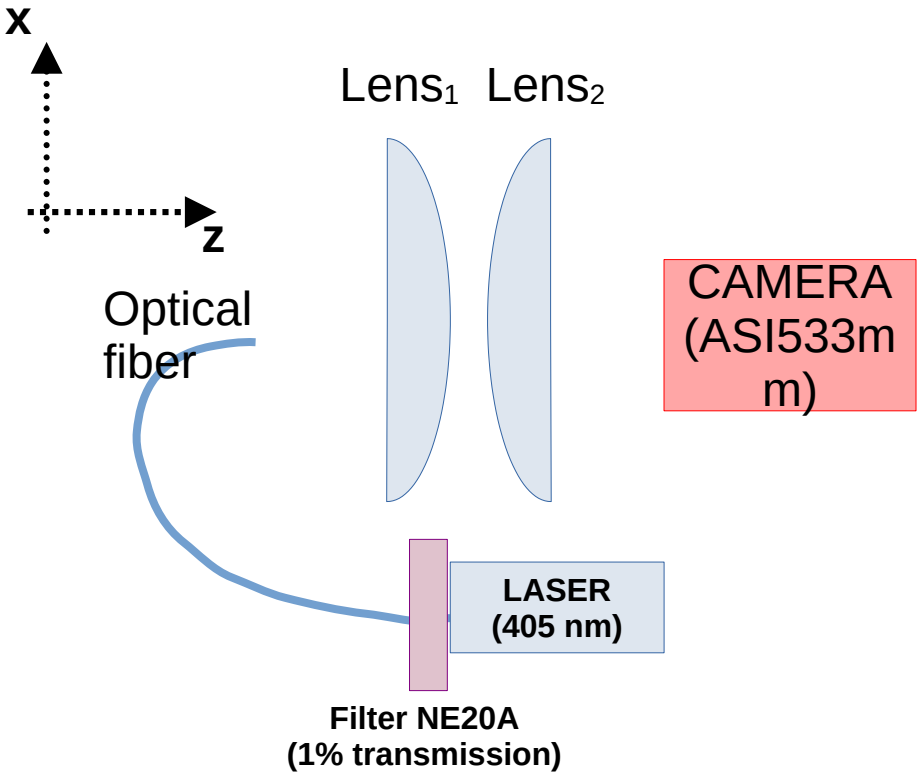
Gen-Z **Learner's Dictionary**

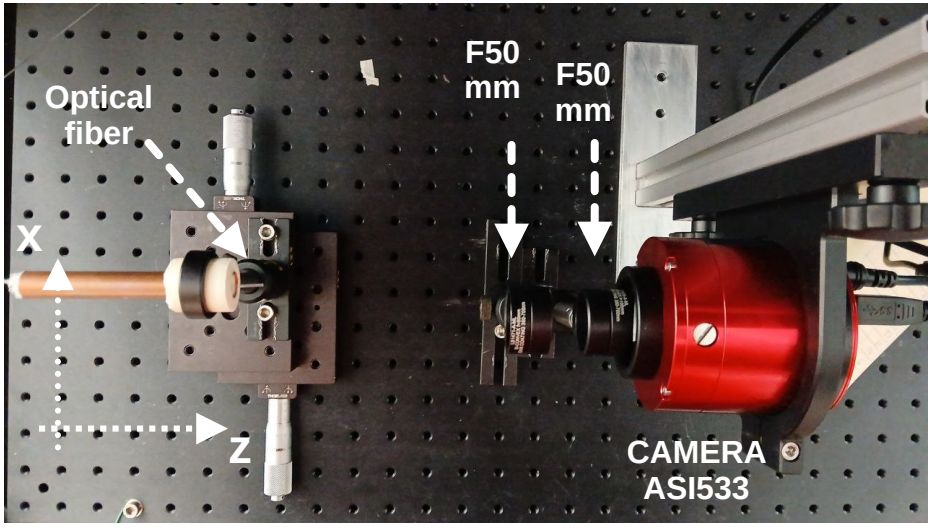
Feeling the glow-up: espr. idom. , gerg. – Refers to a positive transformation or improvement, suggesting a sense of progress and a feeling of having overcome chanllenges.

RIPTIDE

1) Experimental studies of the optics

1) Experimental studies of the optics Setup

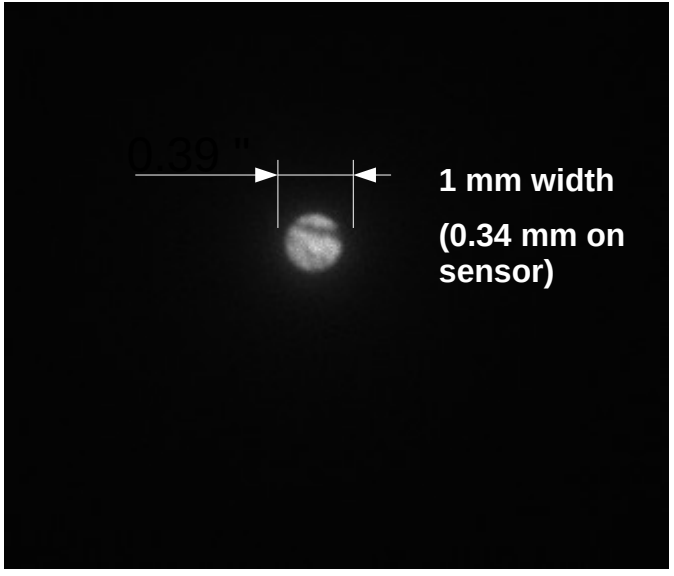




Moving the spot along x and z we studied the luminosity of the optical fiber varying the fiver position

1) Experimental studies of the optics

Preliminary...



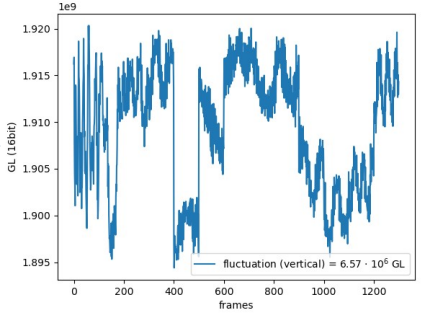
Magnification = 0.34 mm
Field Of View = 60 mm (for 20 mm sensor)

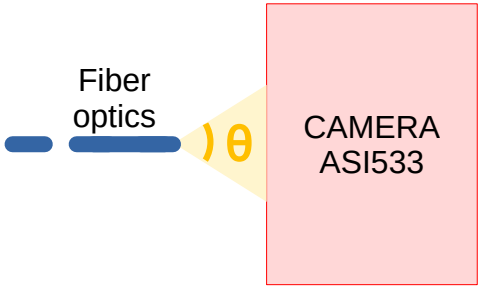
Light intensity = 0.335 µW (= 4.78E8 photons)

Laser Fluctuations = 6.6E6 GL

(- acquire 100 imgs of 700µs
- do GL integral for each image.
- wait 180 s
- repeat for 10 times
- Do standard deviation of the results.

NB: the fluctuation didn't diminish waiting more)





1) Experimental studies of the optics

Preliminary...

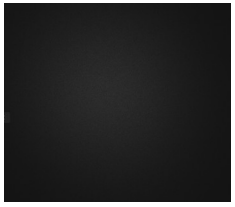
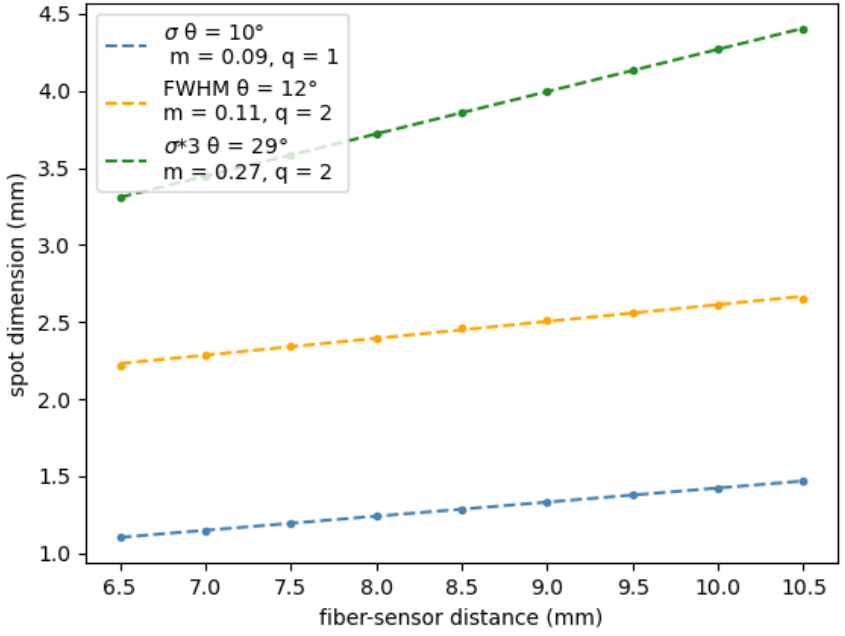


Image on sensor



Hipothesis: the angle of aperture should be proportional to the dimension of the spot on the sensor (w/out the optics) and the distance of the fiber optics and the sensor.

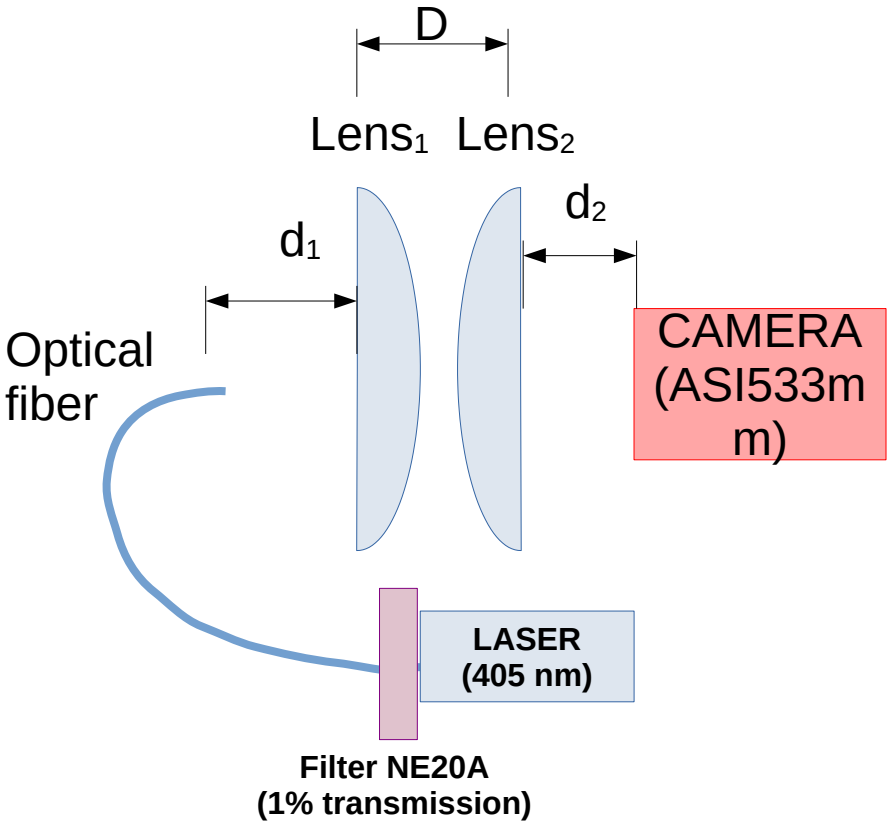
(tan(θ) = ½ spot dimension / fiber-sensor distance)

NB: minimum distance possible is 6.5 mm

The angle of aperture is **~30°** (3σ = 99.7% of the gaussian curve)

1) Experimental studies of the optics

Three optics designs



Lens1	Lens2	d1	d2	D
50mm	50mm	105mm	15mm	~50mm
50mm	50mm	80mm	30mm	~3mm
75mm	60mm	110mm	35mm	~3mm
Nikon optics		110mm	60mm	--

Nikon diaphragm open, focal lenght at minimum (=50mm)

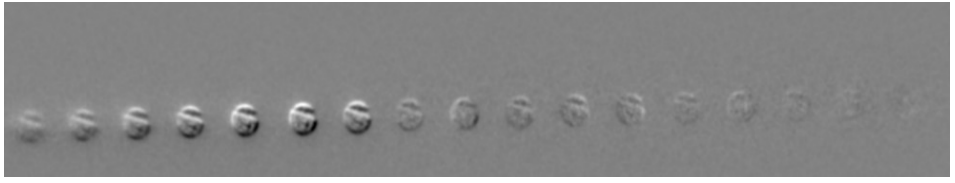
1) Experimental studies of the optics

Light intensity along x axis

On single slit, move optical fiber along x axis and acquire the output.
The aim is to check less instense is teh signal due to the lack in luminosity.

Superimposition of all the images. Bias was removed.

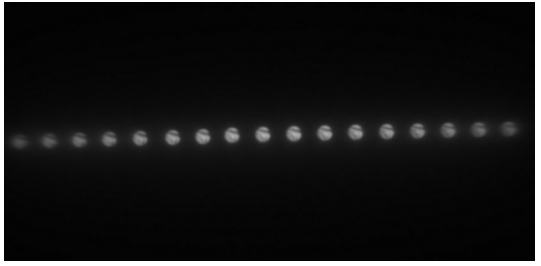
ho fatto andare la slit avanti e indietro per vedere se c'erano grosse variazioni del segnale. Non ho grossi variazioni di segnale.

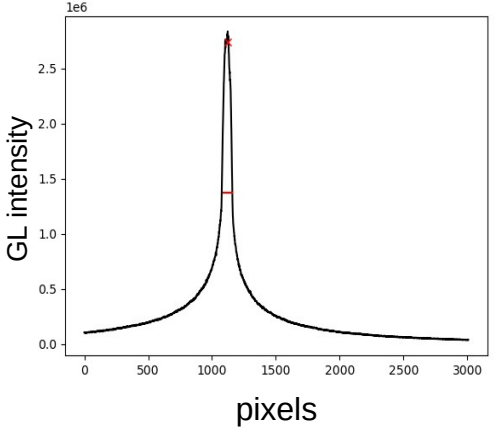


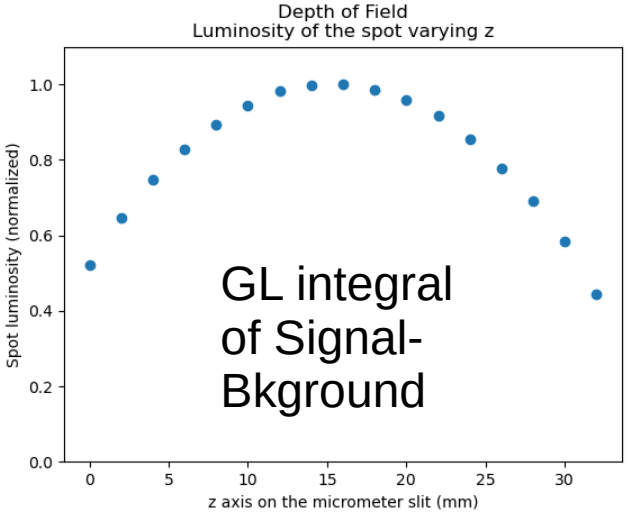
1) Experimental studies of the optics

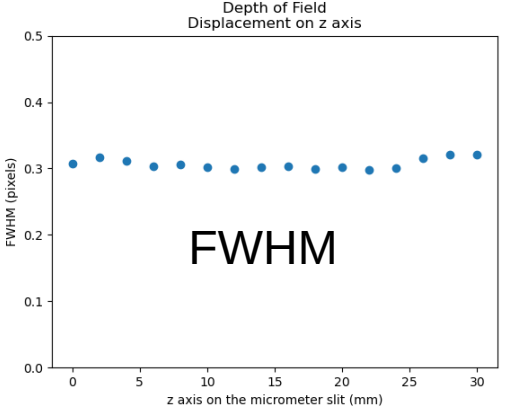
Light intensity along x axis

Measure GL intensity and FWHM of each spot.
The FWHM is done on the projection on x-axis of the spot.







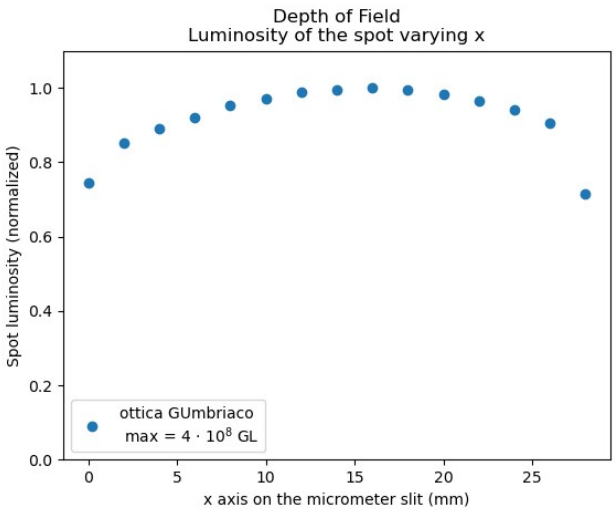


GL integral of Signal-Bkground

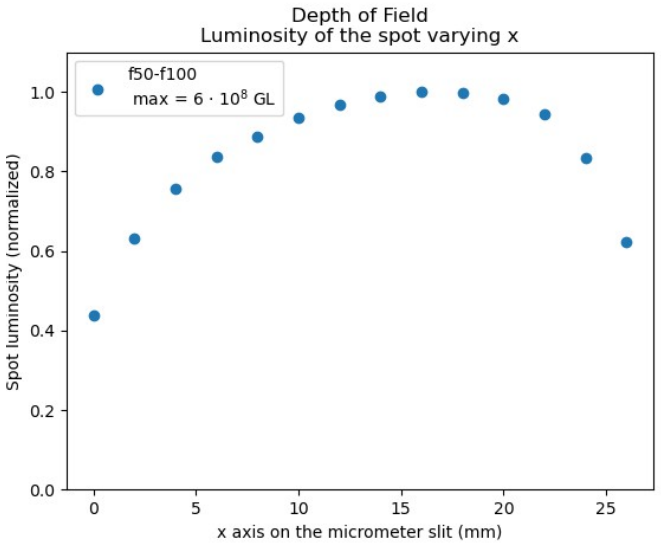
1) Experimental studies of the optics

Light intensity along **x axis** – lenses comparison

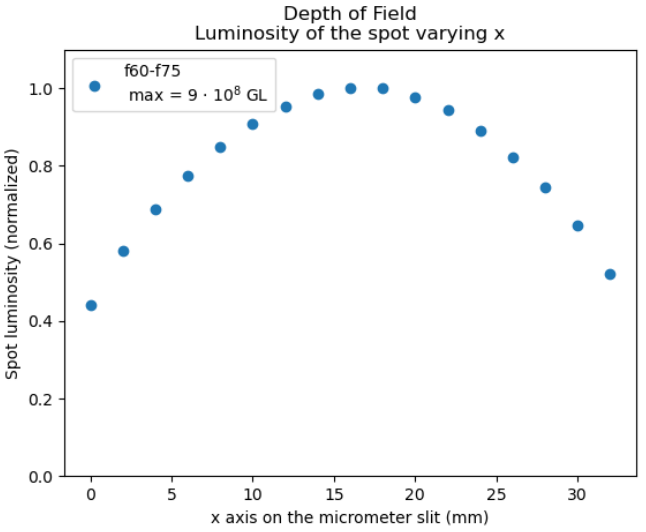
Ottica umbriaco



f50-f50



f60-f75



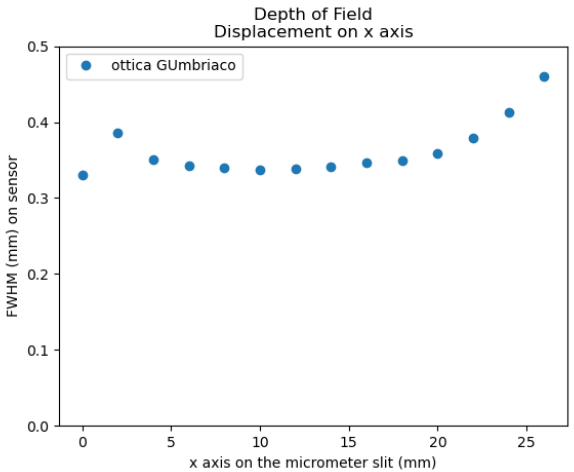
Light intensity is more uniform

FWHM

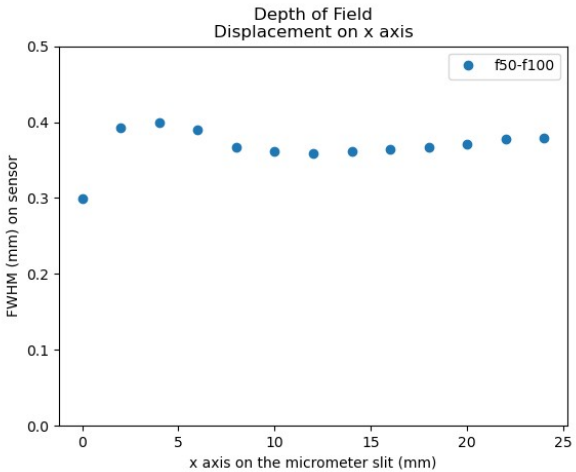
1) Experimental studies of the optics

FWHM along **x axis** – lenses comparison

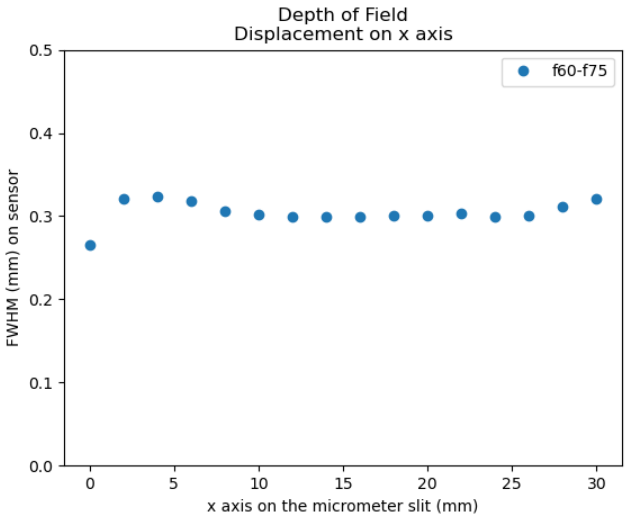
Ottica umbriaco



f 50 f50



f60-f75



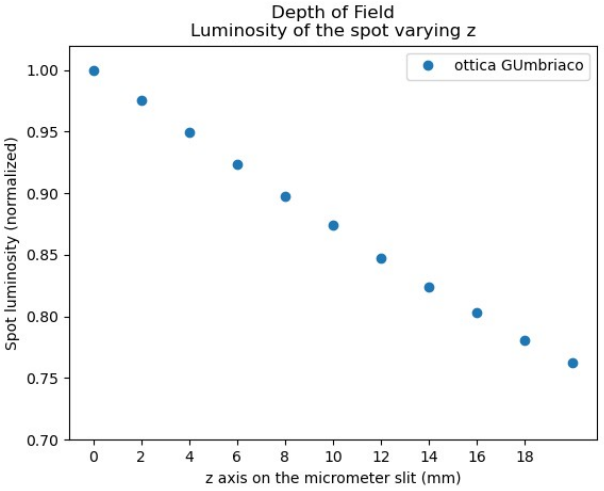
FWHM is more constant

GL integral of Signal-Bkground

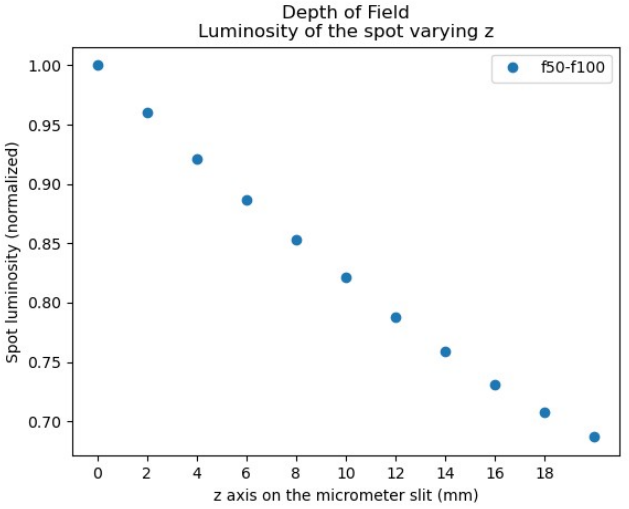
1) Experimental studies of the optics

Light intensity along **z axis** – lenses comparison

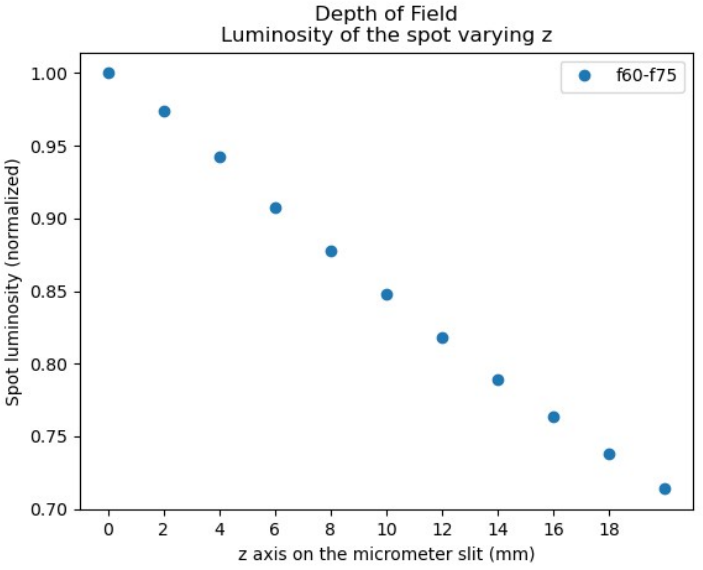
Ottica umbriaco



f 50 f50



f60-f75



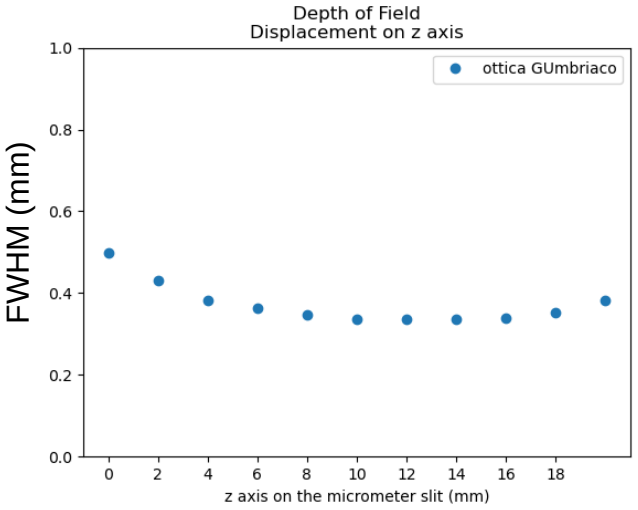
The same for all (obv.)

FWHM

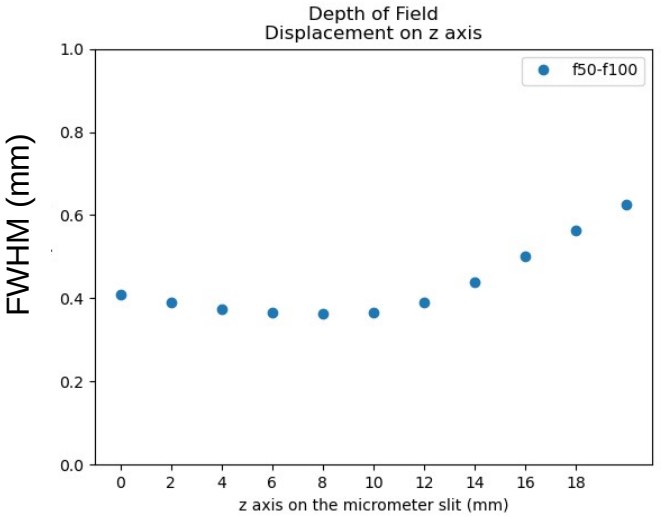
1) Experimental studies of the optics

FWHM along **z axis** – lenses comparison

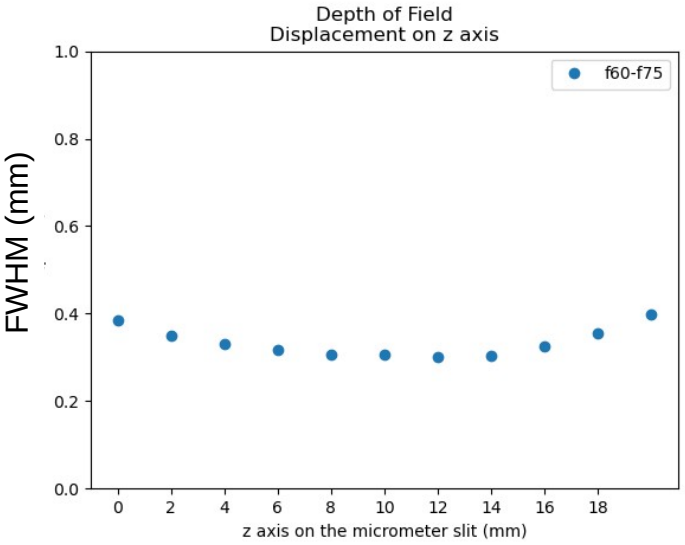
Ottica umbriaco



f 50 f50



f60-f75

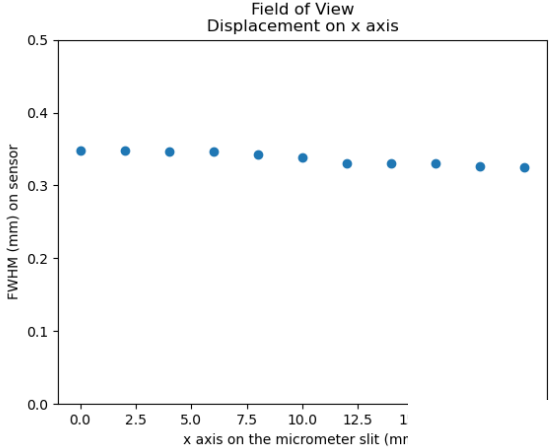


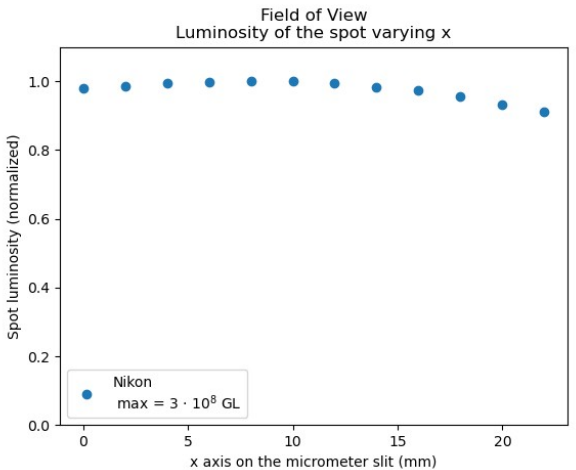
DoF is higher

1) Experimental studies of the optics

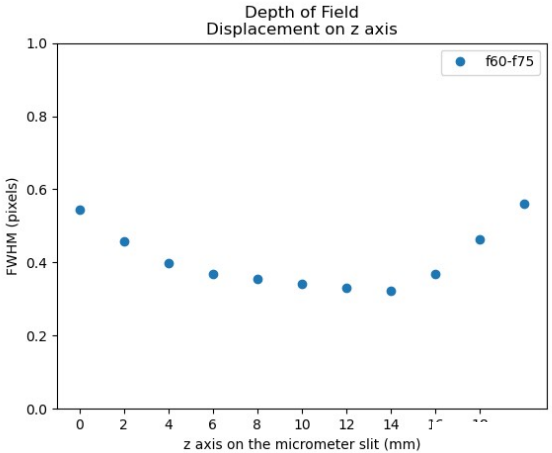
Ottica Nikon

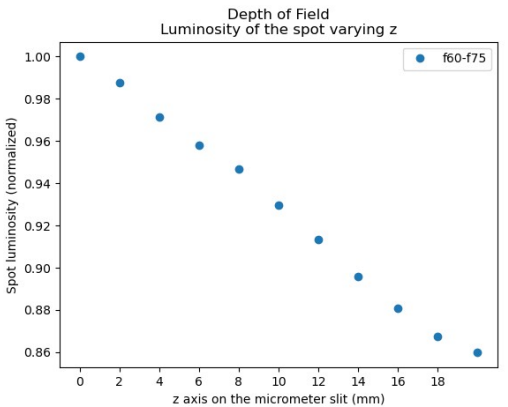
X axis





Z axis





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