RIPTIDE

October 2024

Gen-Z **Learner's Dictionary**

Cannare: v. tr. [prob. der. di canna, come metonimia di «fucile»; quindi, «fare cilecca col fucile»], gerg. – 1. Sbagliare, mancare, fallire, fare fiasco in qualcosa: ho cannato l'esame di guida. 2. Bocciare a un esame: il professore mi ha cannato.

Courtesy of G. Ricci

RIPTIDE

1) ORCA and MCP

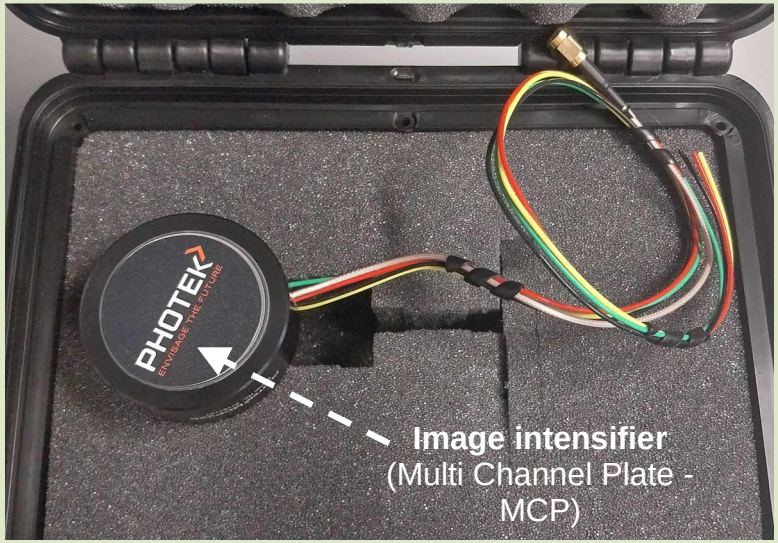
2) General problems

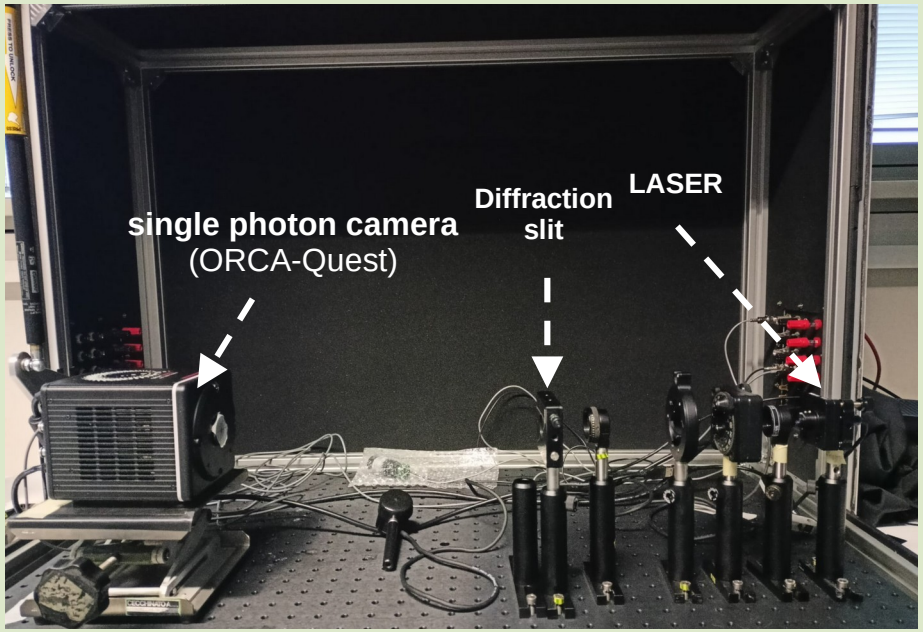
3) Where to find the data

4) Future plans?

1) ORCA and MCP

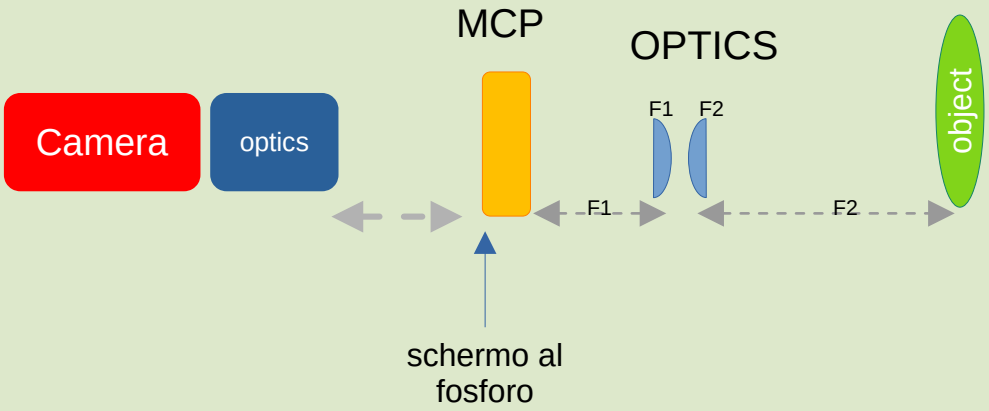
Image intensifiers VS Single photon sensors

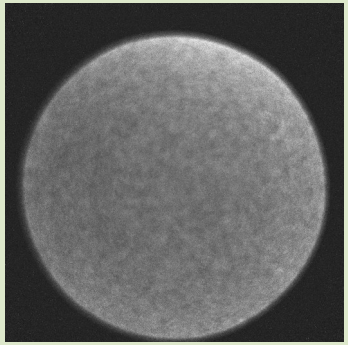




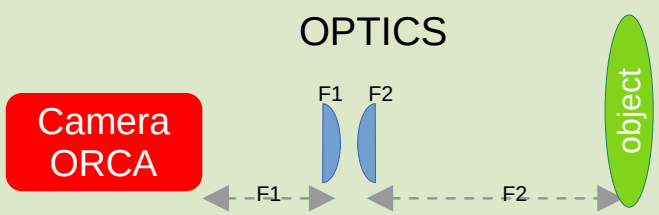
1) ORCA and MCP

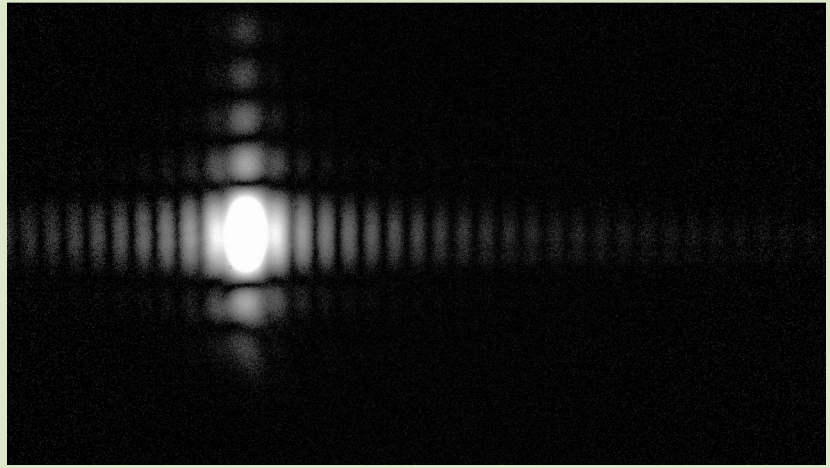
Image intensifiers VS Single photon sensors





5 sec exposizione
5 s





single photon counting mode
200 ms

1) ORCA and MCP

Analysis performed

	ORCA	MCP
^{90}Y β-emitting	V	V
Diffraction	V	X
Cosmic muons	V	V

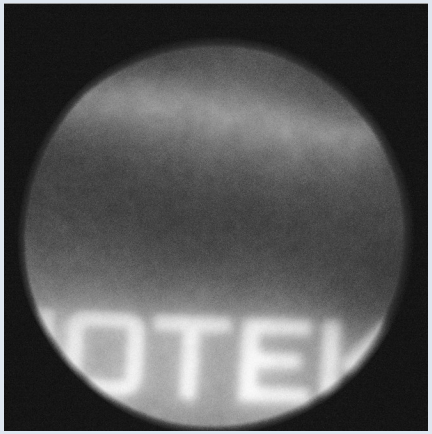
	ORCA	MCP
Pros	- self triggerable - very low readout noise - plug and play (almost) - high spatial resolution	- goes as fast as your external camera can reach (see Cyclon specifics) - high amplificatipn
Cons	- slow (minimum exposure time in single photon counting mode is 200 ms)	- needs an external camera (ASI-533) + trigger - way too much noise (to understand better) - lot of effort also for cable connection - low spatial resolution (to understand better)

2) General problems

too much photons inside the black box

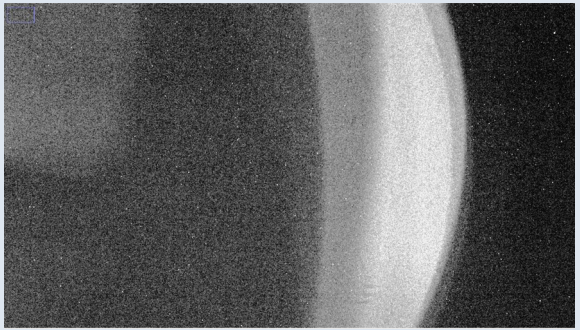
There are photons inside the camera (From outside or produced inside?)

MCP



By covering the MCP PhotoCathode with its cover and closing the box, it was possible to see the logo (PHOTEK)

ORCA



After some postprocessing, it is clearly visible the ‘shadow of the lenses used to focus the light into the camera.

The amount of noise is reduced using Cinefoil rolled around the camera, but there is still some noise all around (MCP image was obtained when the full structure was completely covered by cinefoil)

2) General problems

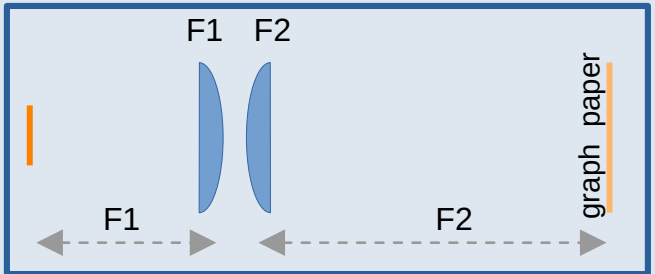
The optics

The optical system needs to be studied more.

- Less than 1 cm depth of focus (needs to be studied better)

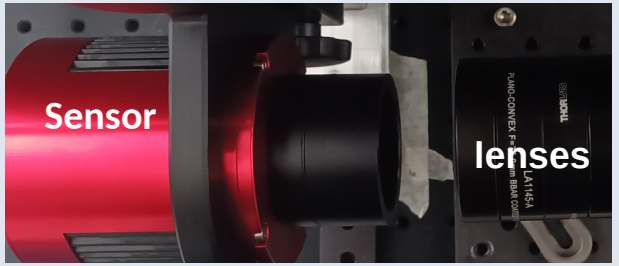
- The method used to calibrate the camera is not precise.

- is this effectively the best optical system?
- how much is the photon loss?



F1 = 75 mm
F2 = 125 mm

Sensor + Lenses



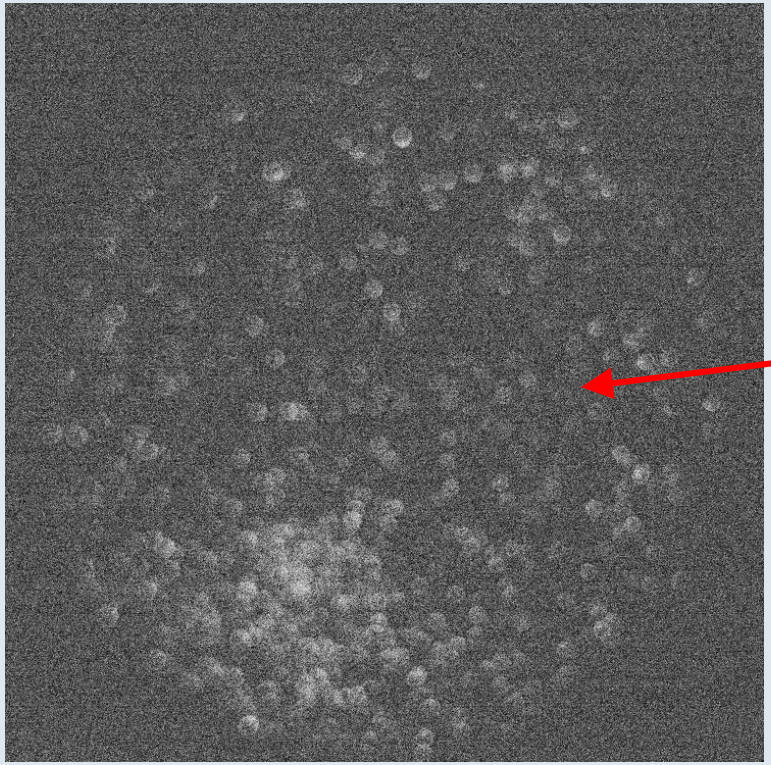
FOV

15 x 15 mm

DOF

15-20 mm

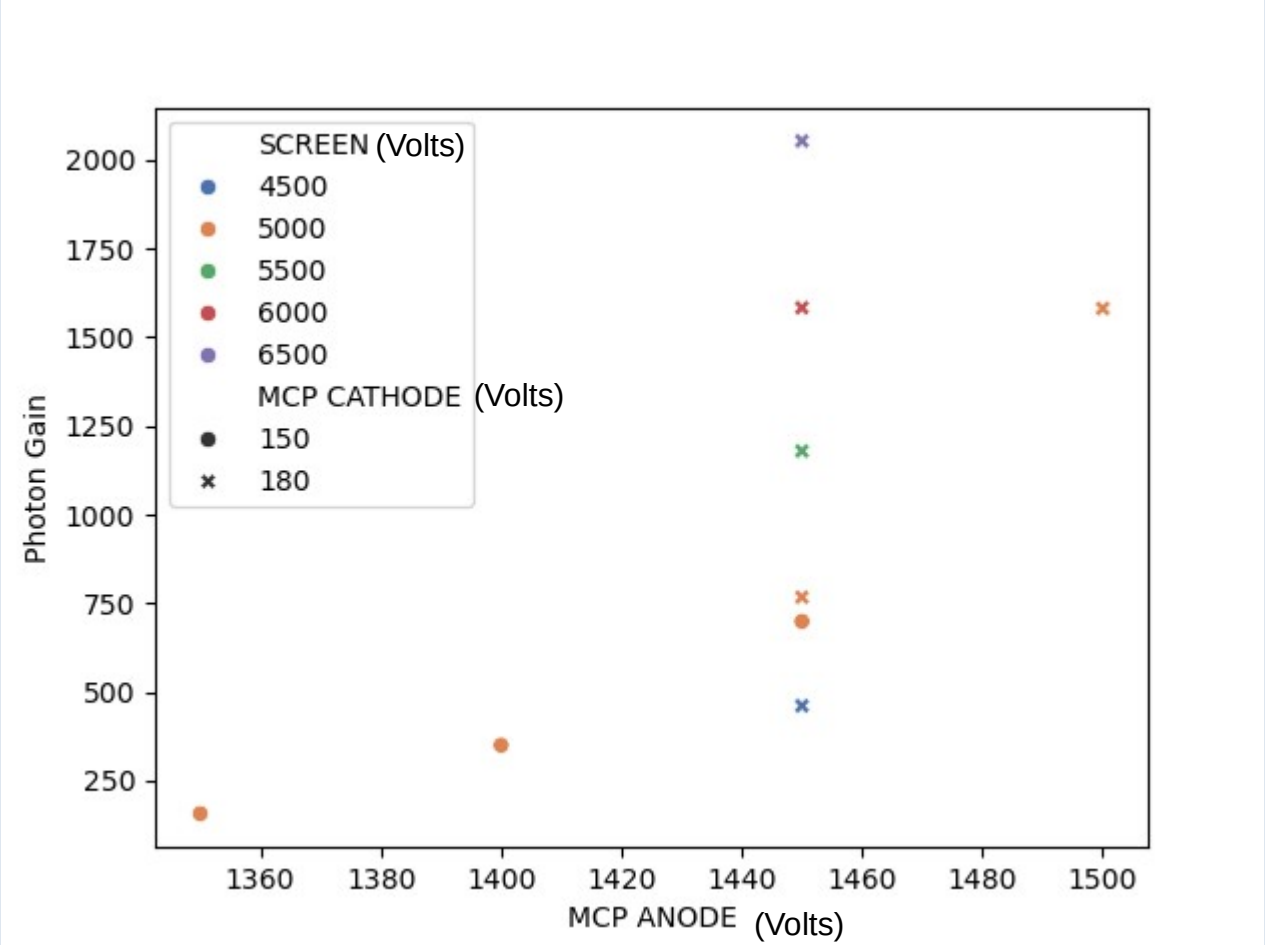
2) MCP problems



Gain = 600
Exposure = 10 ms

Single spot ~ 1 mm on the MCP screen
(declared: 0.1 mm)

2) MCP gain



Photon gain = #photon out / # photon in

photon out (measured with the camera)

photon in (measured with the photocathode)

(sketch on the blackboard)

3) Where to find the data

Backup in an hard-disk (currently in LAB).

- Directory = Backup_RIPTIDE_LAB_2024-10-08

- Windows: complete backup of windows partiton content (included TRIGGER_labview)
- Linux: All the data acquired with the camera ASI533 from the beginning (divided day by day)
- PC-lab: Images acquired with the ORCA-cam.

All directory names are not self-explaining. Using the logbook (Red book in lab) it is possible to get information on what is inside the images.

4) future plans??

Any idea for future tests with the MCP?

Do we need another type of MCP?

Quantitative analysis on the ORCA/MCP needs to be done