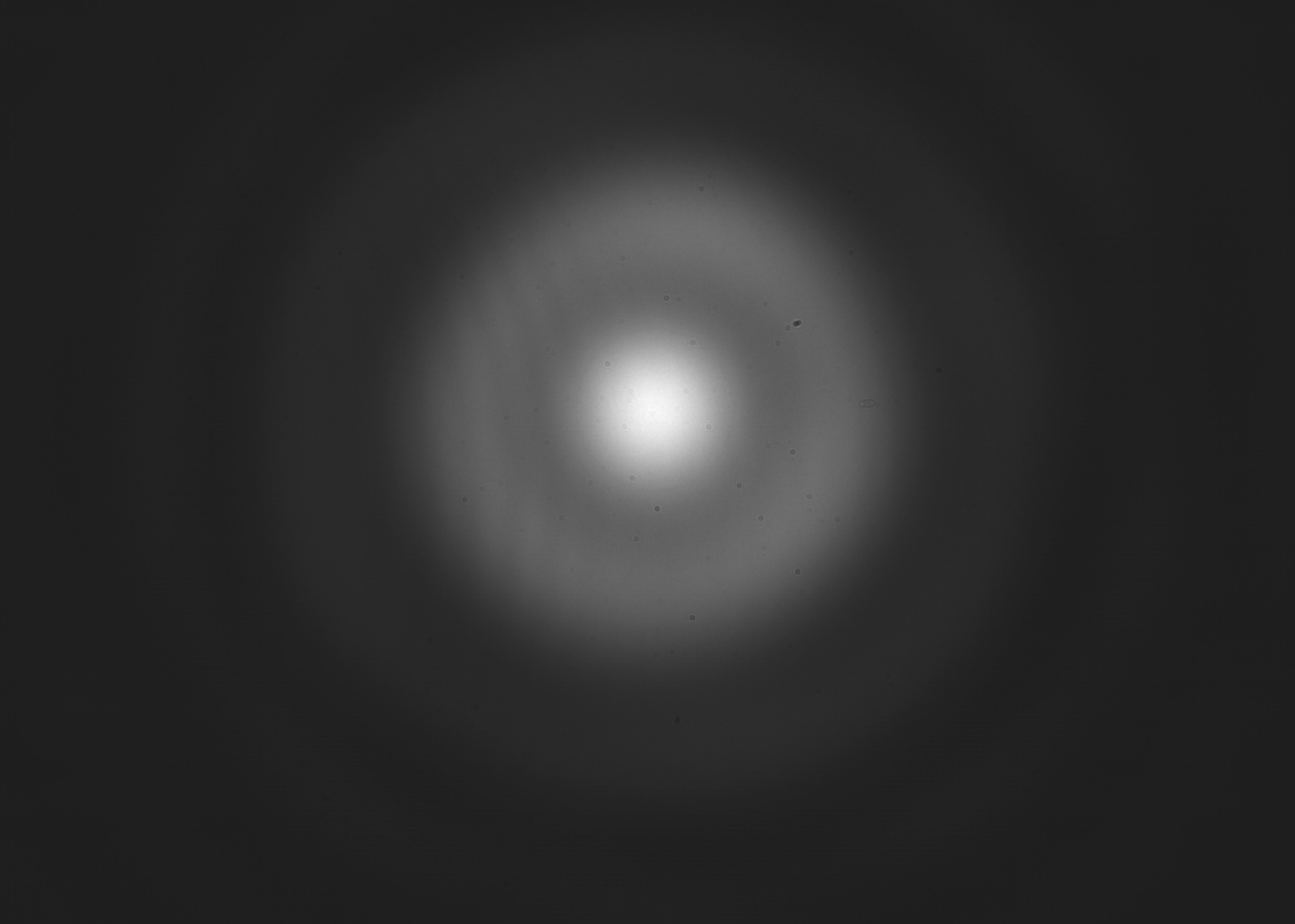
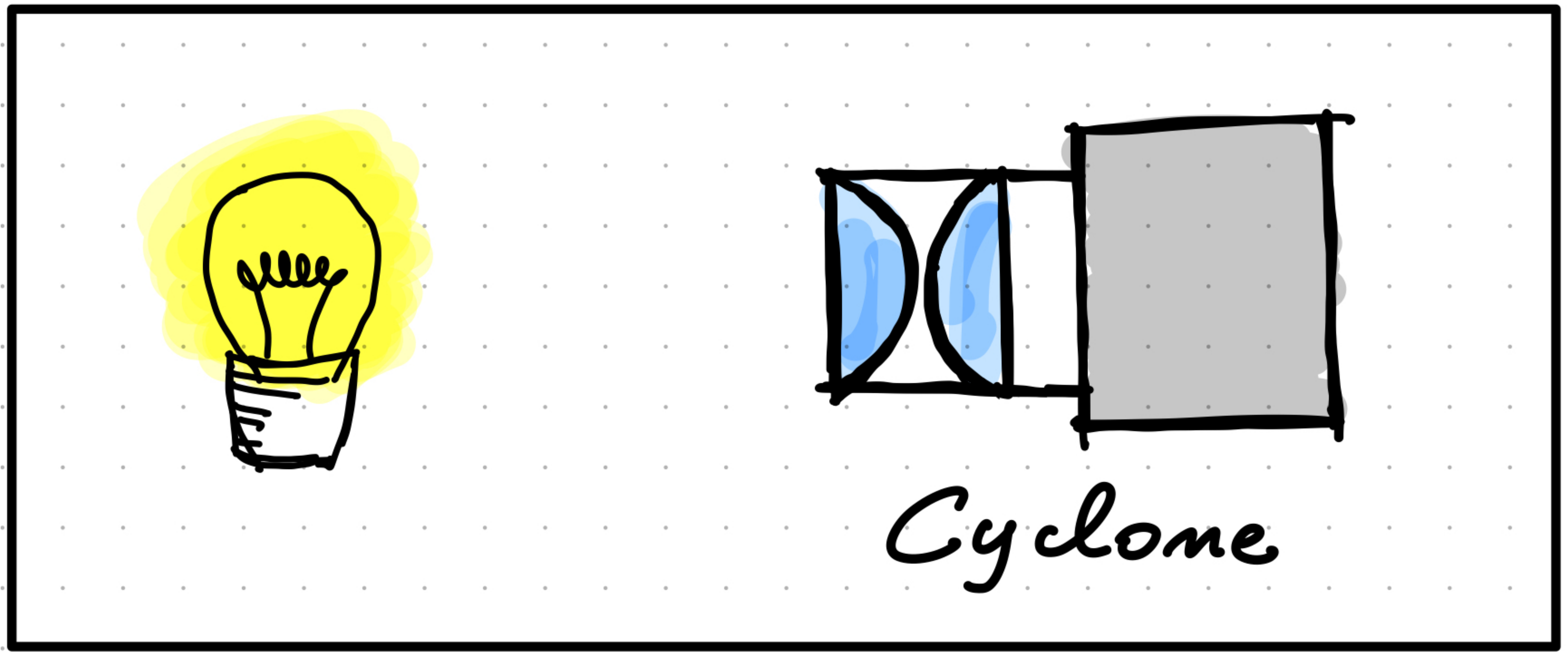
Laboratorio & Simulazioni

Samuele Lanzi - Aprile 2025



Profondità di campo *Ramsden eyepiece*



Obiettivo: Verificare se la DOF corrisponde a quella attesa mettendo a fuoco il filamento di una lampadina

Risultato: DOF ~ 5 mm, simile a quanto ci si aspettava usando la formula

$$\text{DOF} \sim \frac{2f_{eq}^2 C(1+M)}{D^2} \sim 1 \text{ mm}$$

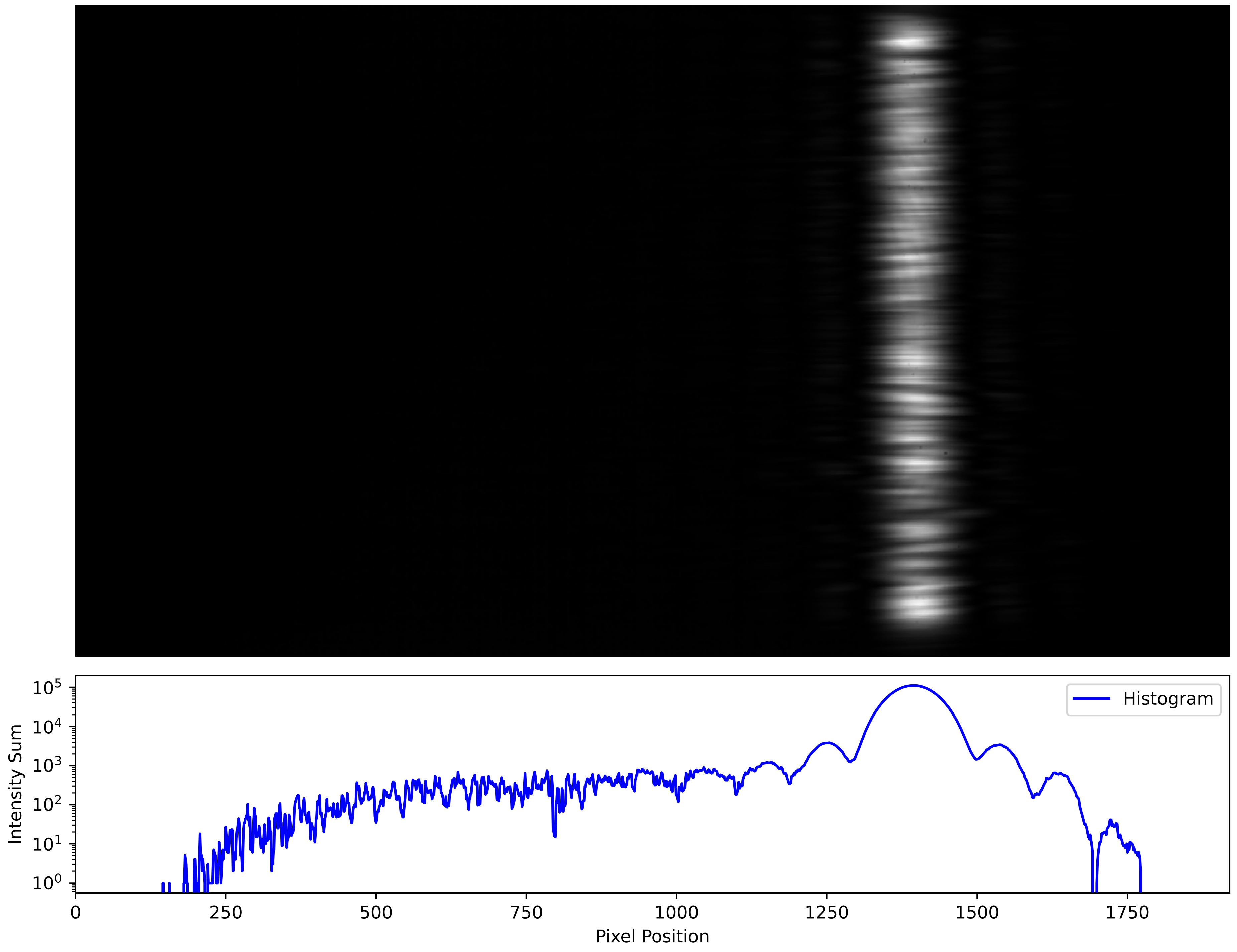
f_{eq} focale equivalente sistema di lenti

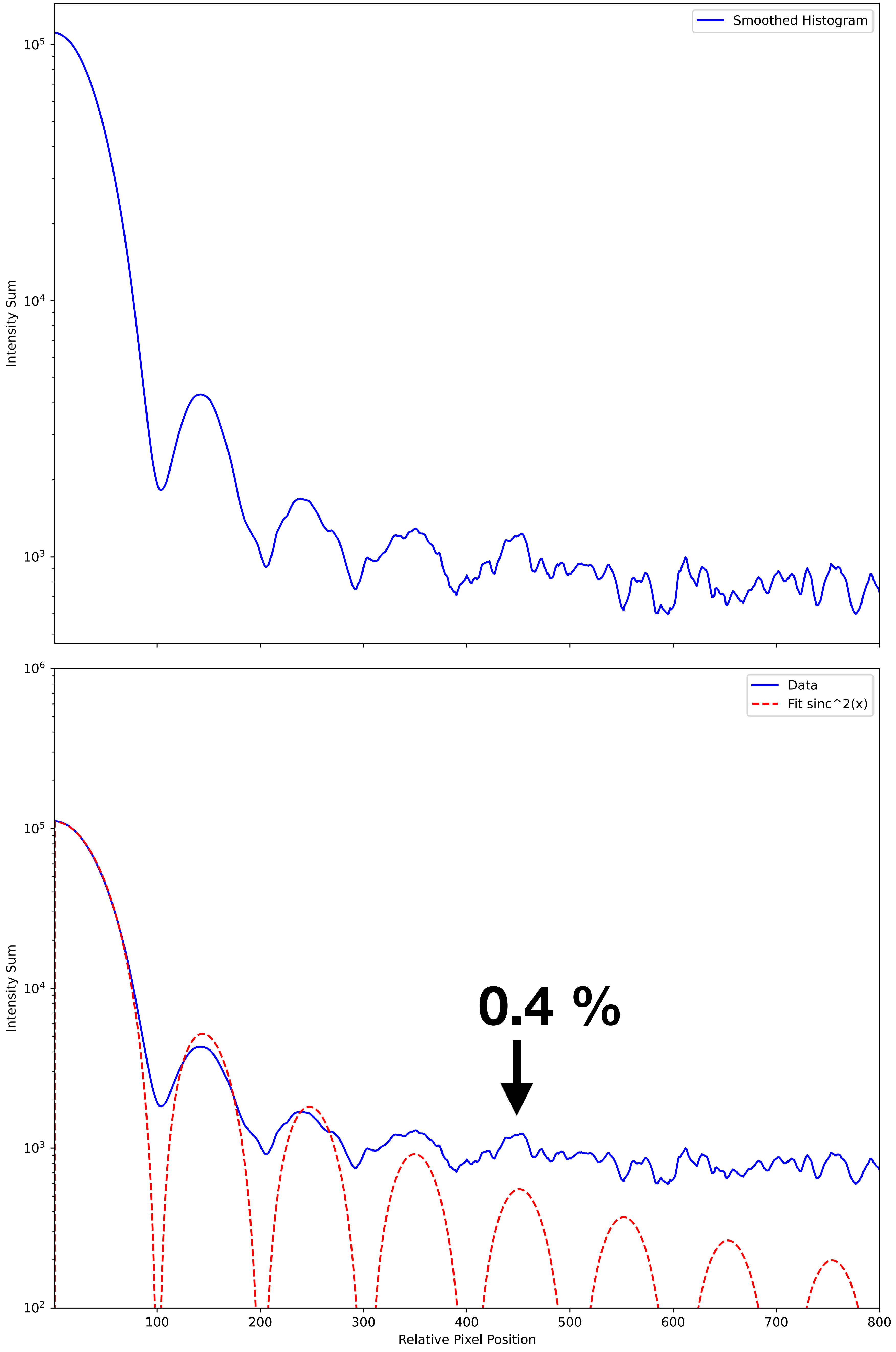
C circle of confusion

M ingrandimento

D diametro lenti

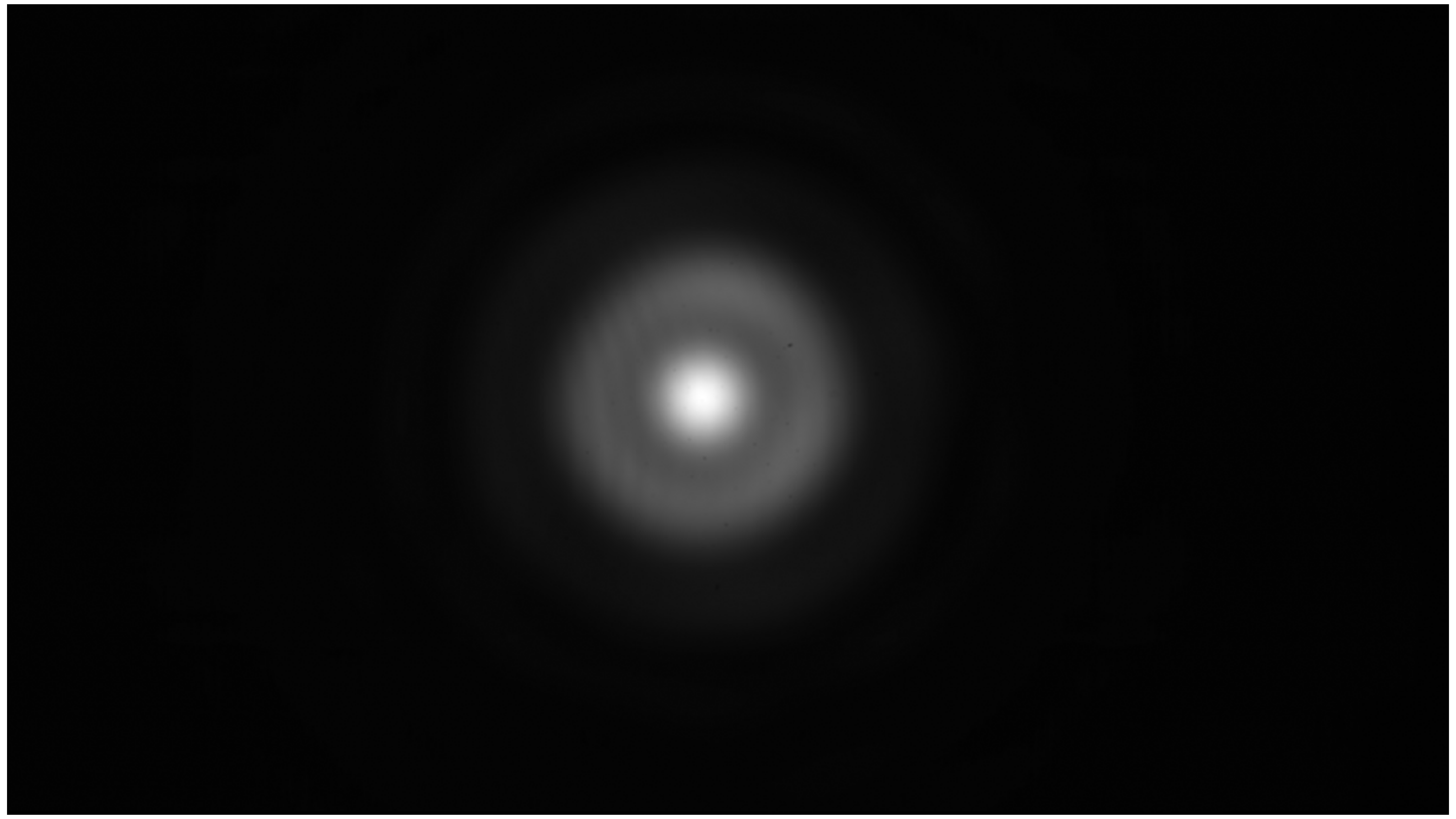
Diffrazione slit 50 μm

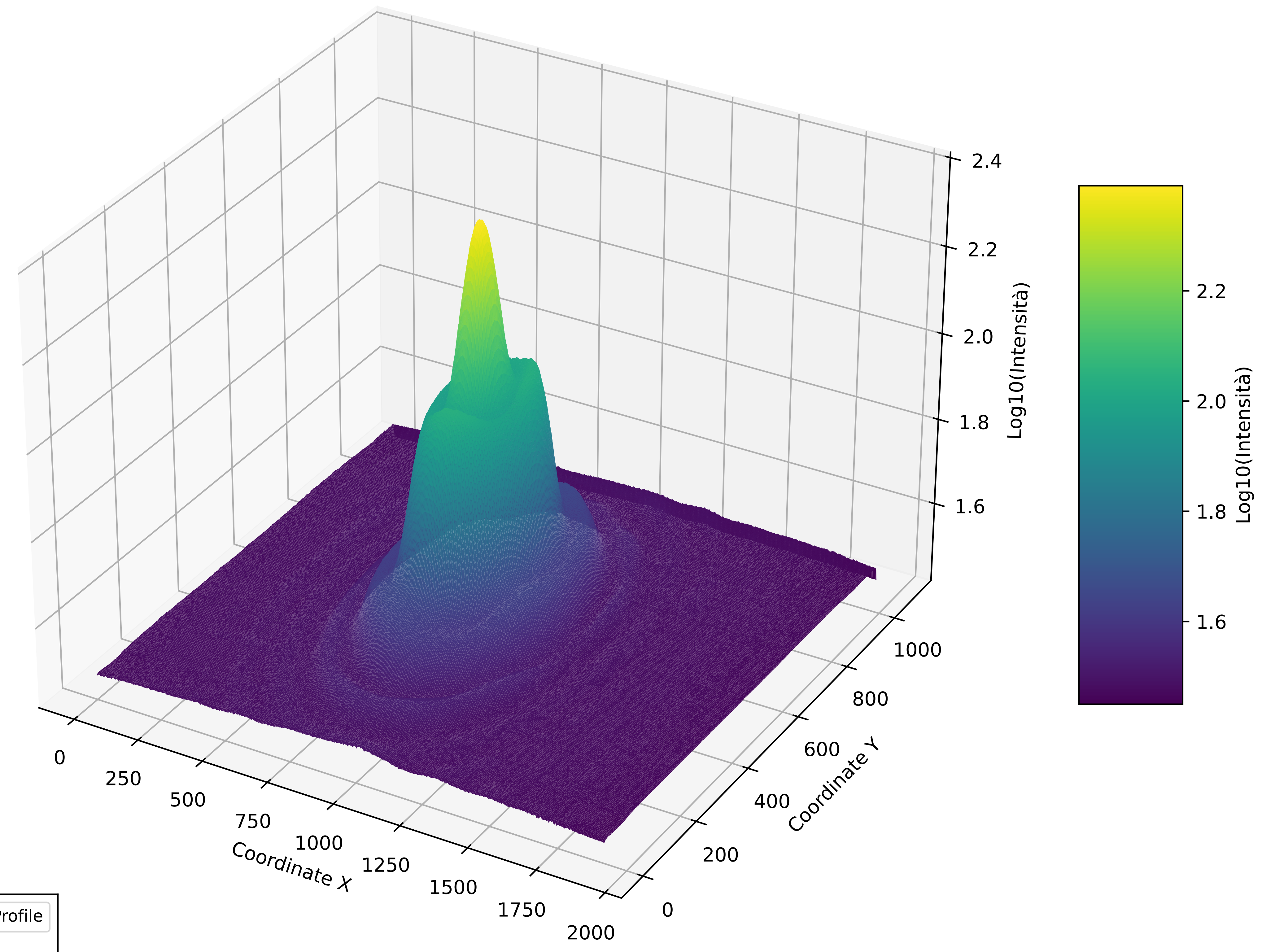


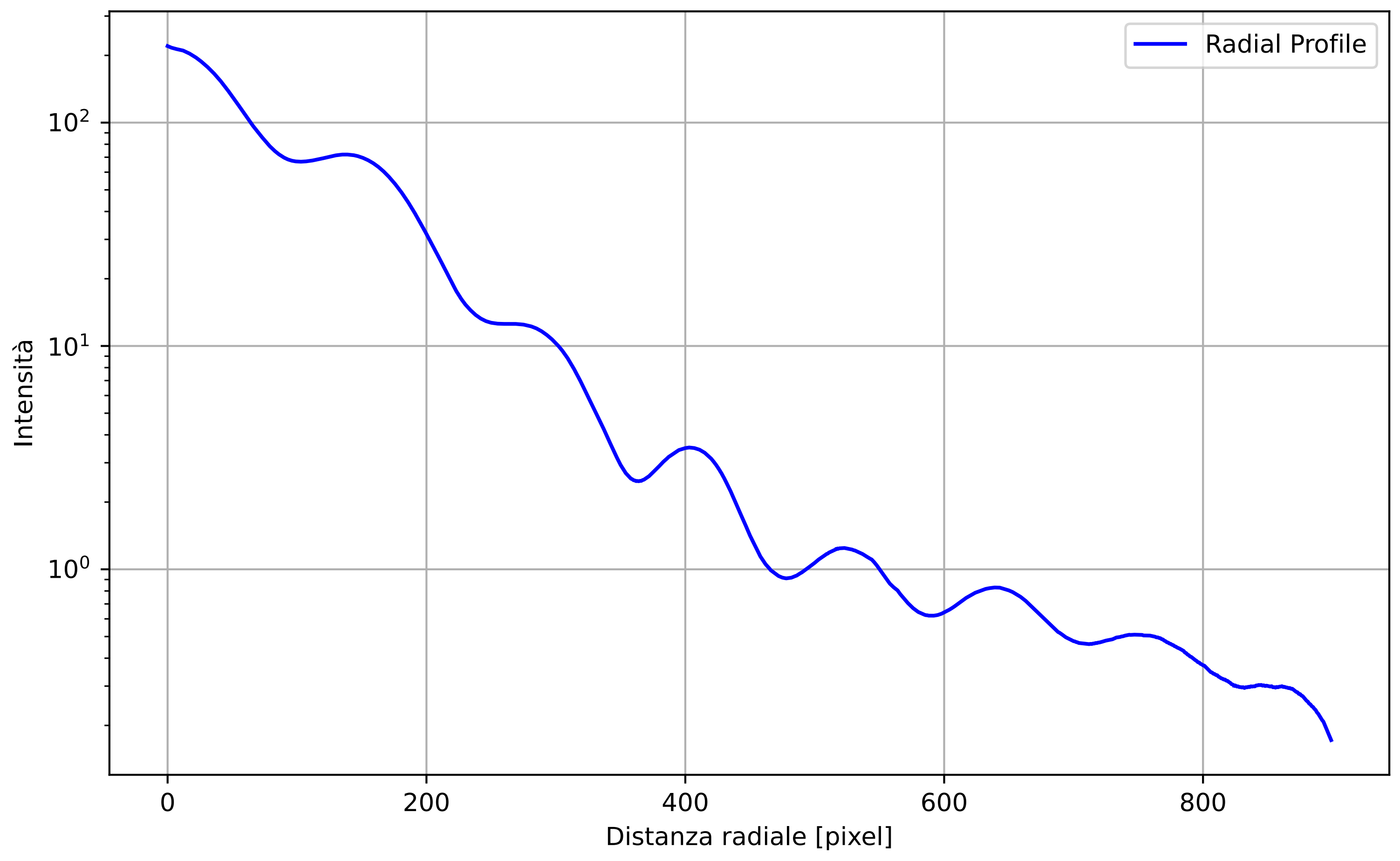


Svolgendo il calcolo $N_{fotoni} = Pt_{exp}/E_{fotone}$ nella finestra considerata mi aspetto ancora una volta ~ 100 fotoni

Diffrazione pinhole







Varie strategie di fit non hanno portato a risultati significativi

Proceeding ISGC

max 15 pagine, deadline 21 Aprile

PROCEEDINGS OF SCIENCE

Scintillating light track reconstruction for fast neutron detection based on deep learning techniques

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Tracking imaging systems have progressed from manual examination to utilizing contemporary photodetectors, like SiPM arrays and CMOS cameras, to convert scintillation light into digital data and obtain physical information. This study presents RIPTIDE, a novel recoil-proton track imaging system designed for fast neutron detection, with an emphasis on the use of deep-learning methods. RIPTIDE utilizes neutron-proton elastic scattering within a plastic scintillator to produce scintillation light, creating images that document scattering occurrences. A deep neural network is employed to rectify optical distortions in proton track images, enhancing their form and alignment. This adjustment improves the precision of track length measurements, which directly affects proton energy estimation and neutron kinematics reconstruction.

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