



**High  
Luminosity  
LHC**

# **LHC Fluorescence measurements**

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The HiLumi LHC Design Study is included in the High Luminosity LHC project and is partly funded by the European Commission within the Framework Programme 7 Capacities Specific Programme, Grant Agreement 284404.



# Outline

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- ① Aim of the experiments
- ① Planned experiments for Run 3
- ① Camera module at LHC
- ① Control application



# Aim of the experiments

## Fluorescence cross-sections & LHC beam profile

- Neon - working gas
  - Locally distributed to LHC pipe
  - Max -  $5 \times 10^{-8}$  mbar
- Protons
  - Flat top - 6.8 TeV
  - Injection - 450 GeV
- Lead beam - end of 2022

# Planned experiments at LHC - 2022

## Background light

- Synchrotron radiation

## Distributed gas measurements

- Max pressure -  $5 \times 10^{-8}$  mbar
- First injection
  - Carefully observing BLMs, and local RadMONs
  - In contact with OP

Injection tests

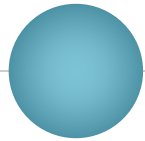
First injection

Main measurements

Interesting physics

When: (May? ->)

- Commissioning:
  - First nominal bunch
  - 450 GeV train
  - First stable beam
- Proton physics fill
- Ion beam



# Camera module at LHC

# Camera Assembly

## Intensified camera

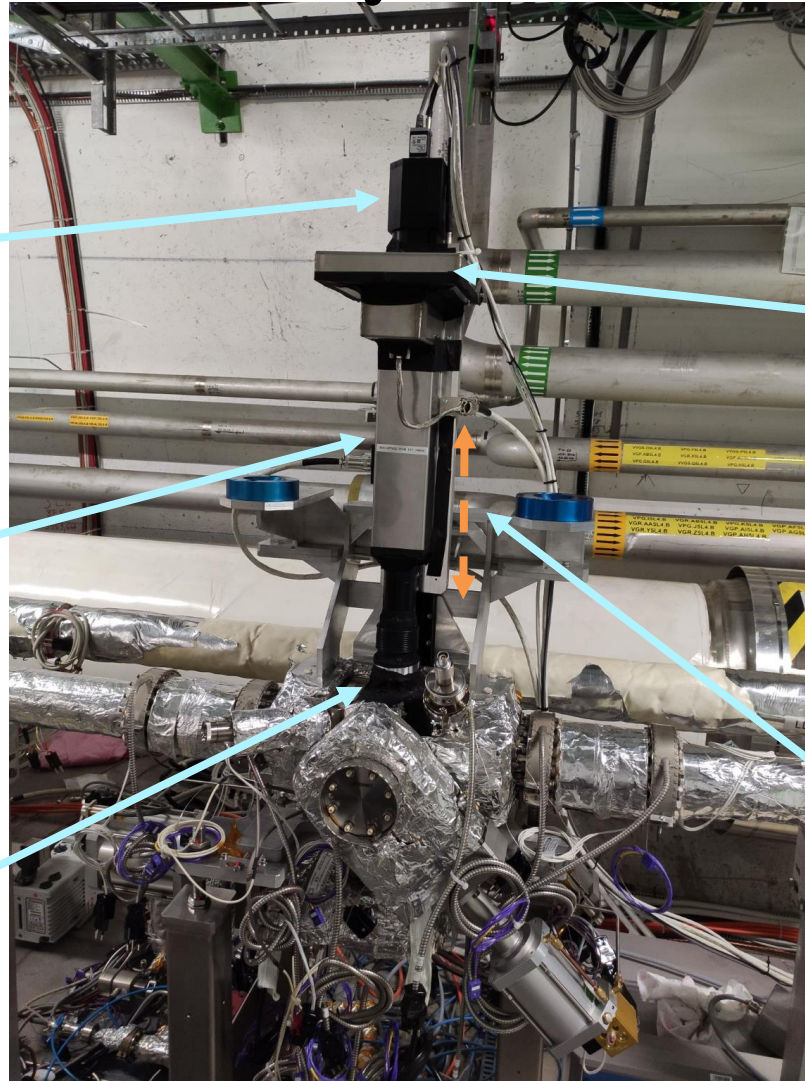
- From V3

## Lens

- Achromatic triplet

## Target

- For focusing
- Insertable



## Filter wheel

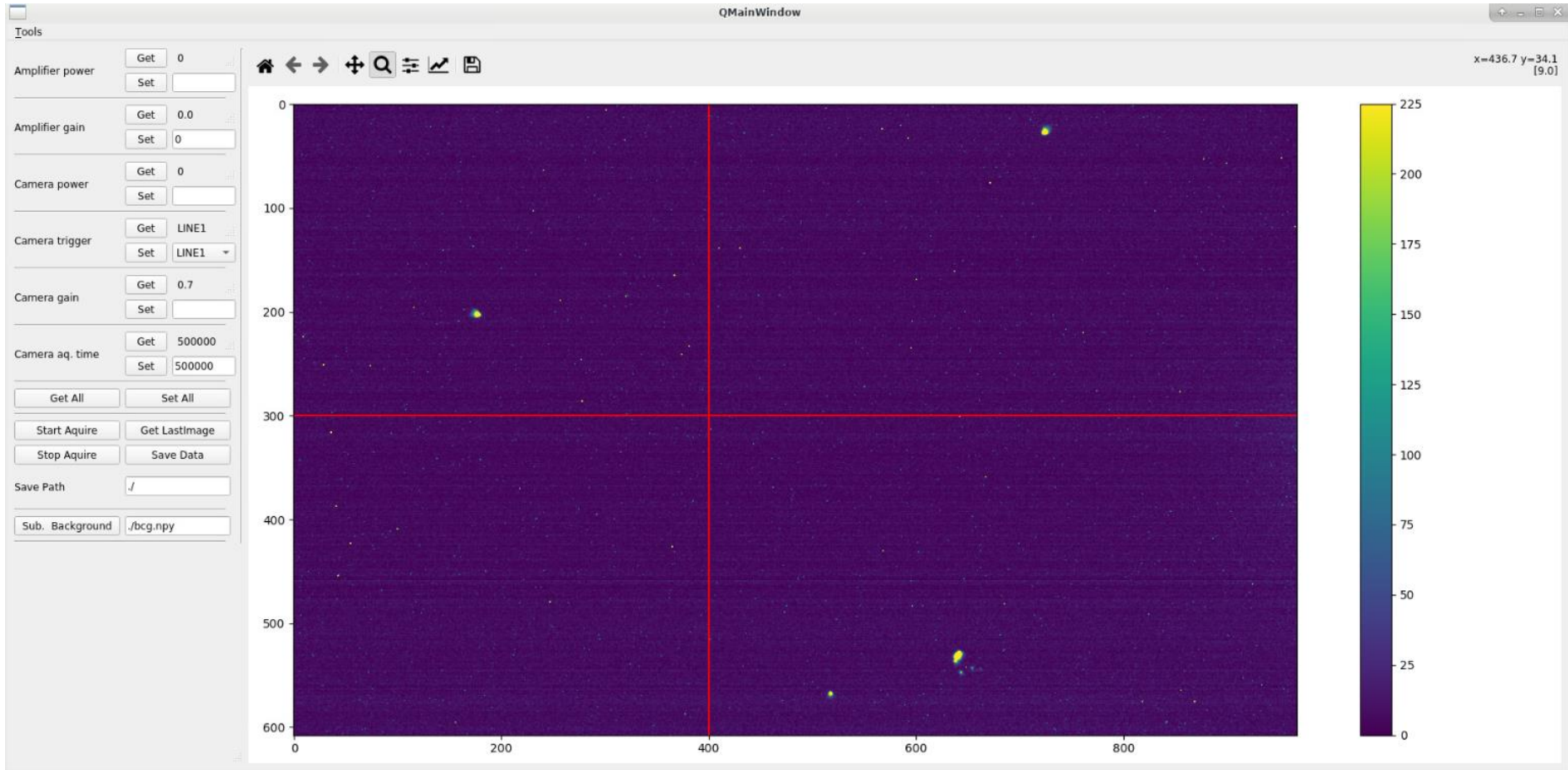
- $585 \pm 10 \text{nm}$
- $340 \pm 40 \text{nm}$
- ND3
- Block
- Through

## Motorized vertical mover

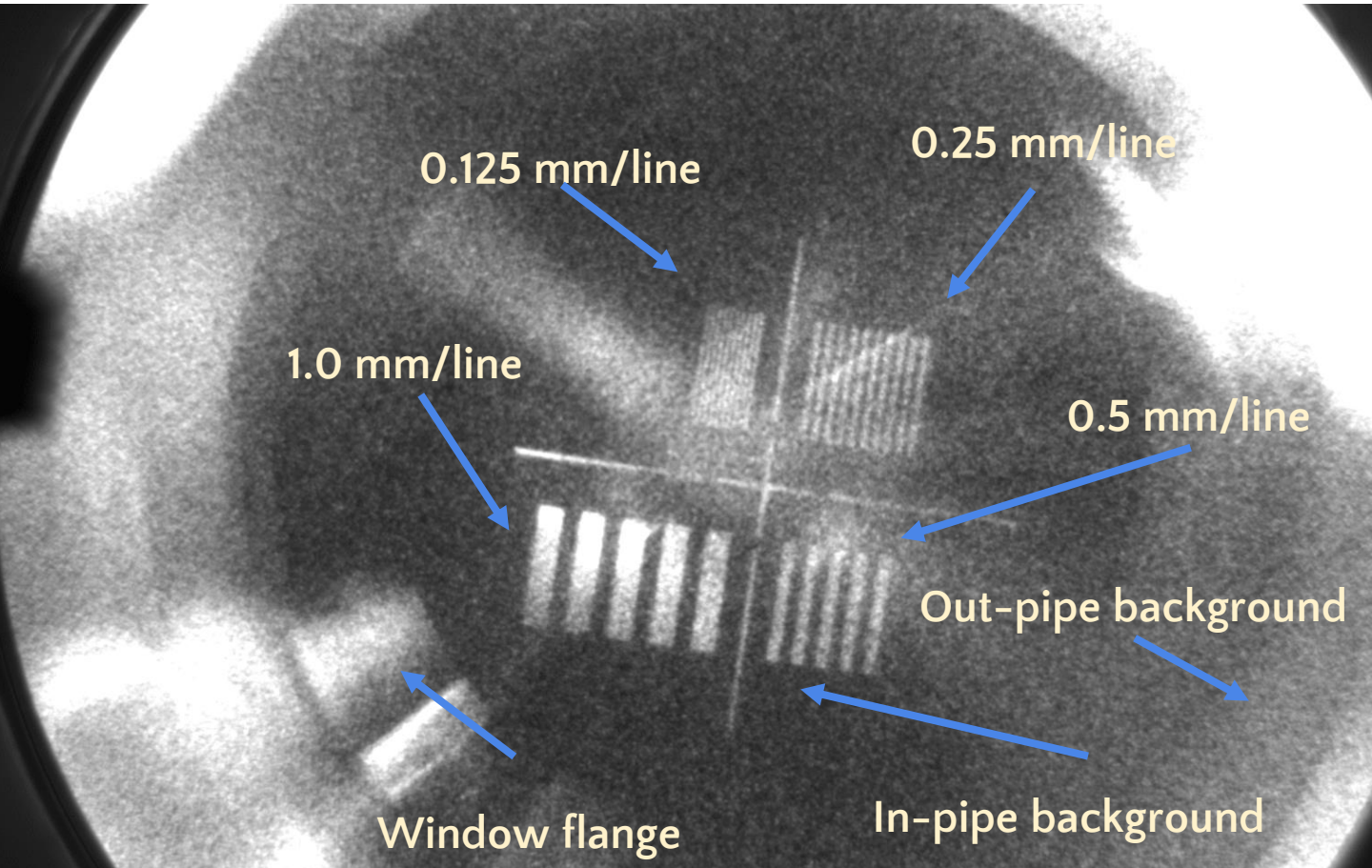
- Adjusting the position of focal plane



# Control application



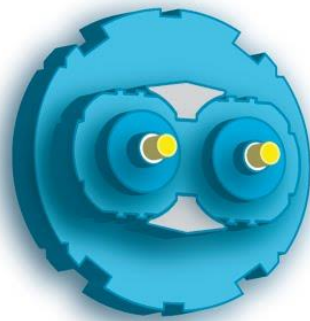
# Optical system



- Optics focused
- System ready for beam

Magnification	0.205
Pixels/300um	10.5





# High Luminosity LHC

## Thank you for your attention

### Any questions?

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# LIV.

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0101	0000	010101001010
0011	111001	010101001001
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The Cockcroft Institute  
of Accelerator Science and Technology



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