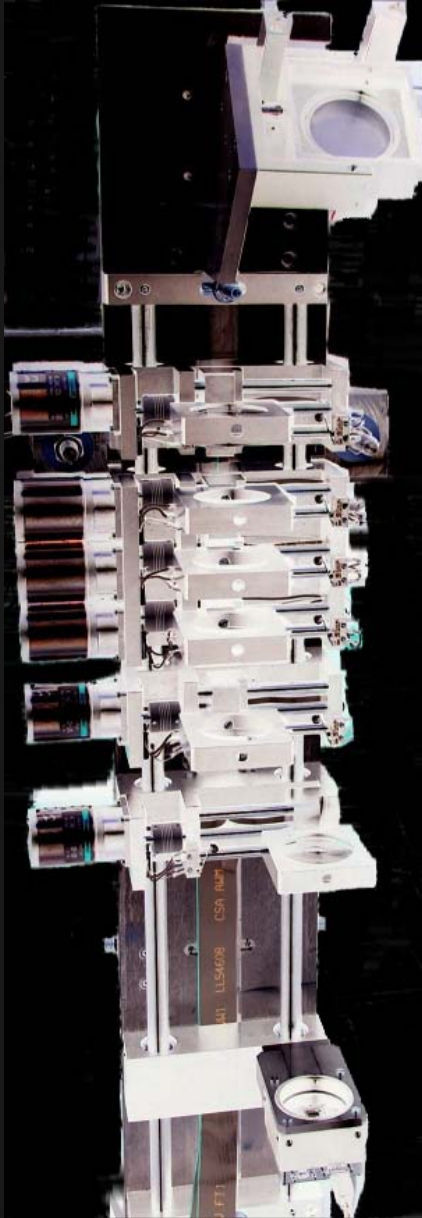


TTF-VUV FEL Optical Systems



LNF Frascati:

L. Cacciotti

M. Castellano

G. Di Pirro

O. Giacinti

R. Sorchetti

DESY

K. Honkavaara

Roma 2 :

L. Catani

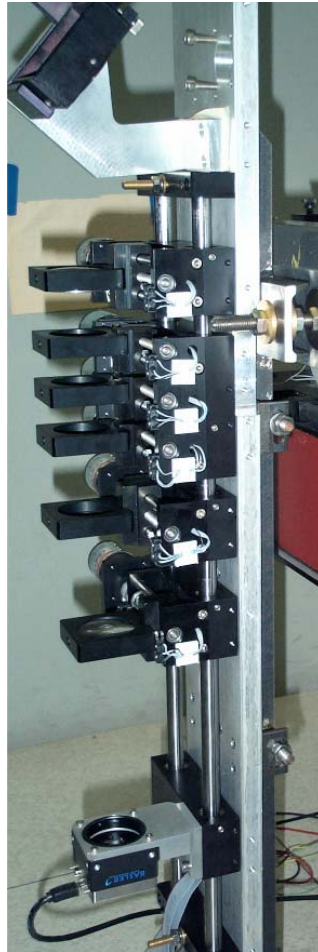
E. Chiadroni

A. Cianchi

M. Raparelli



TTF2 OTR Optical System

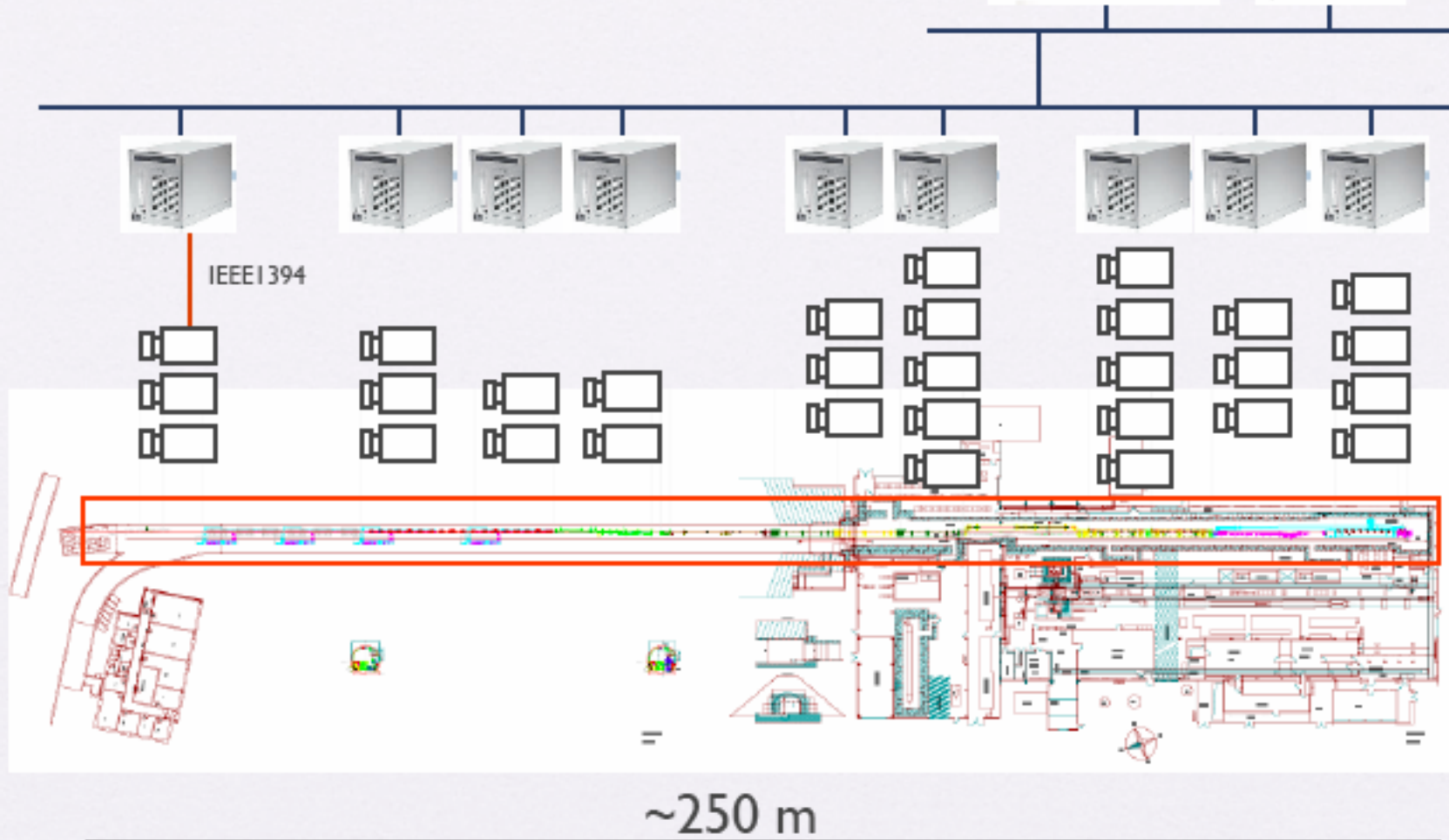


- New design for phase 2
- Flexible
- Remote controlled
- Protected
- Magnificatio 1, .39, .25

ODCS

Optical Diagnostics Control System

Image Server -
Display Tools -
Measurement applications -



Total Camera Number

18 Standard Optical System

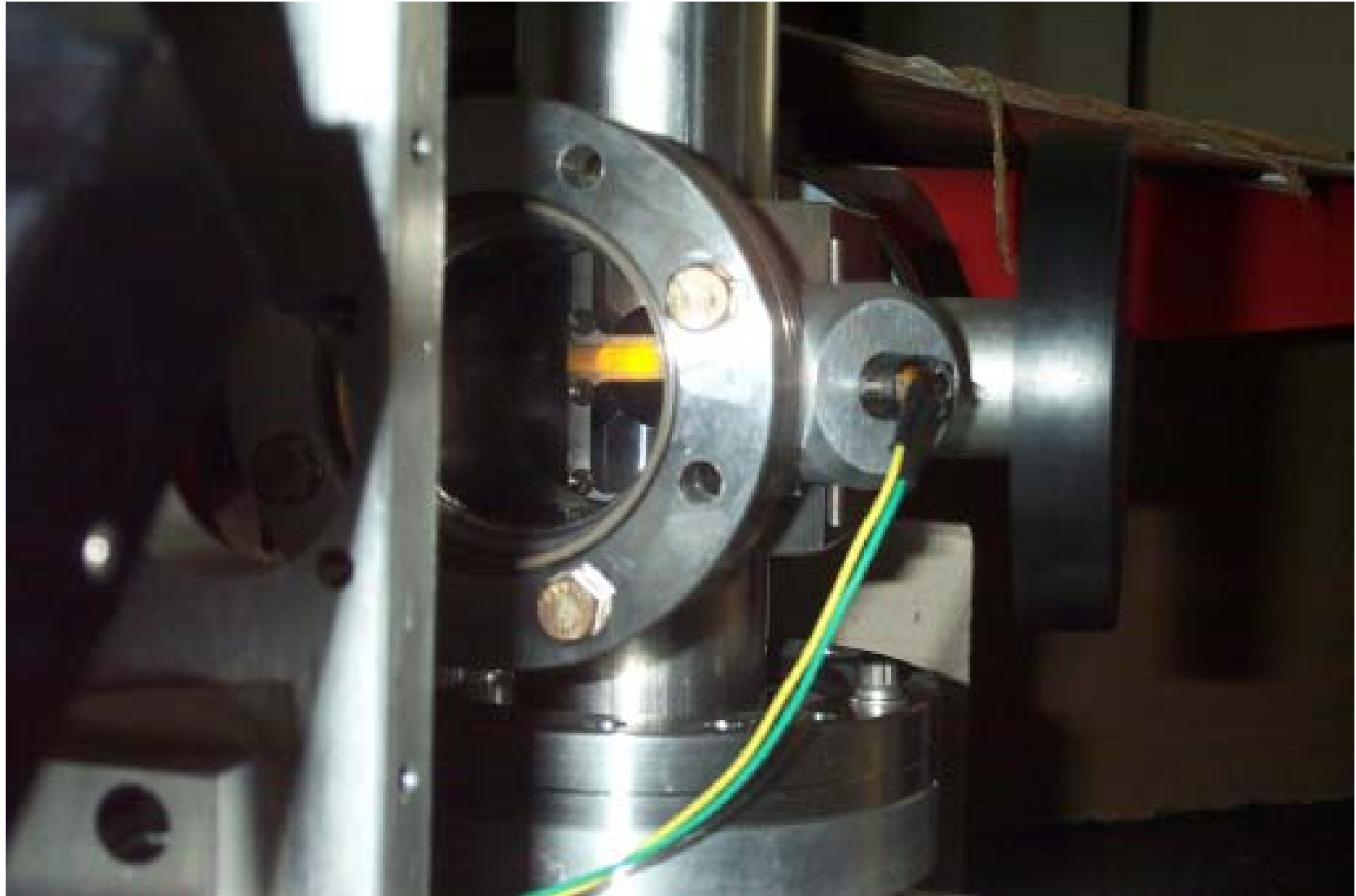
3 Gun Camera

4 Fixed magnification (1 BC2 3 Bypass)

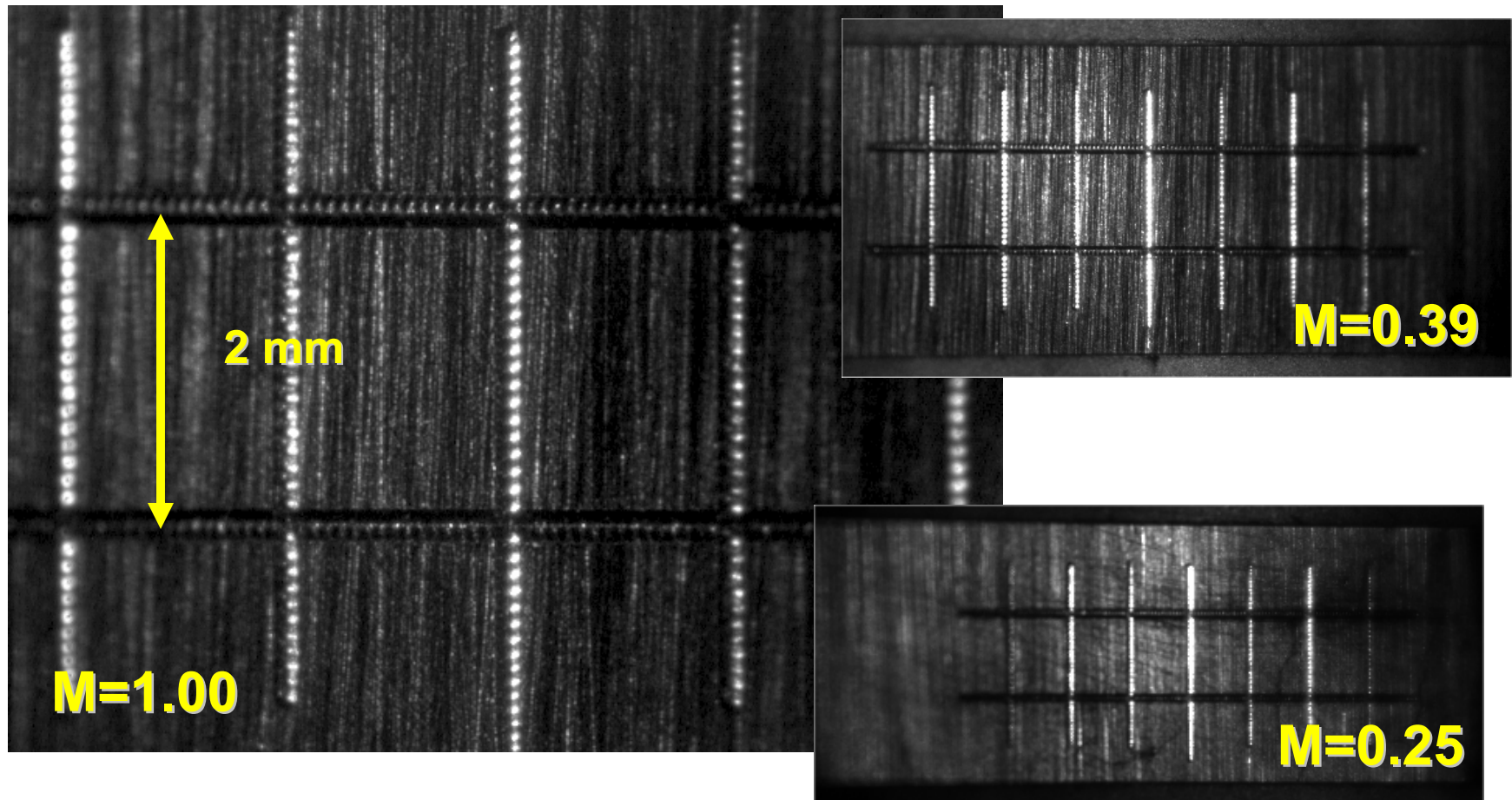
2 Diffractors

All of them are working

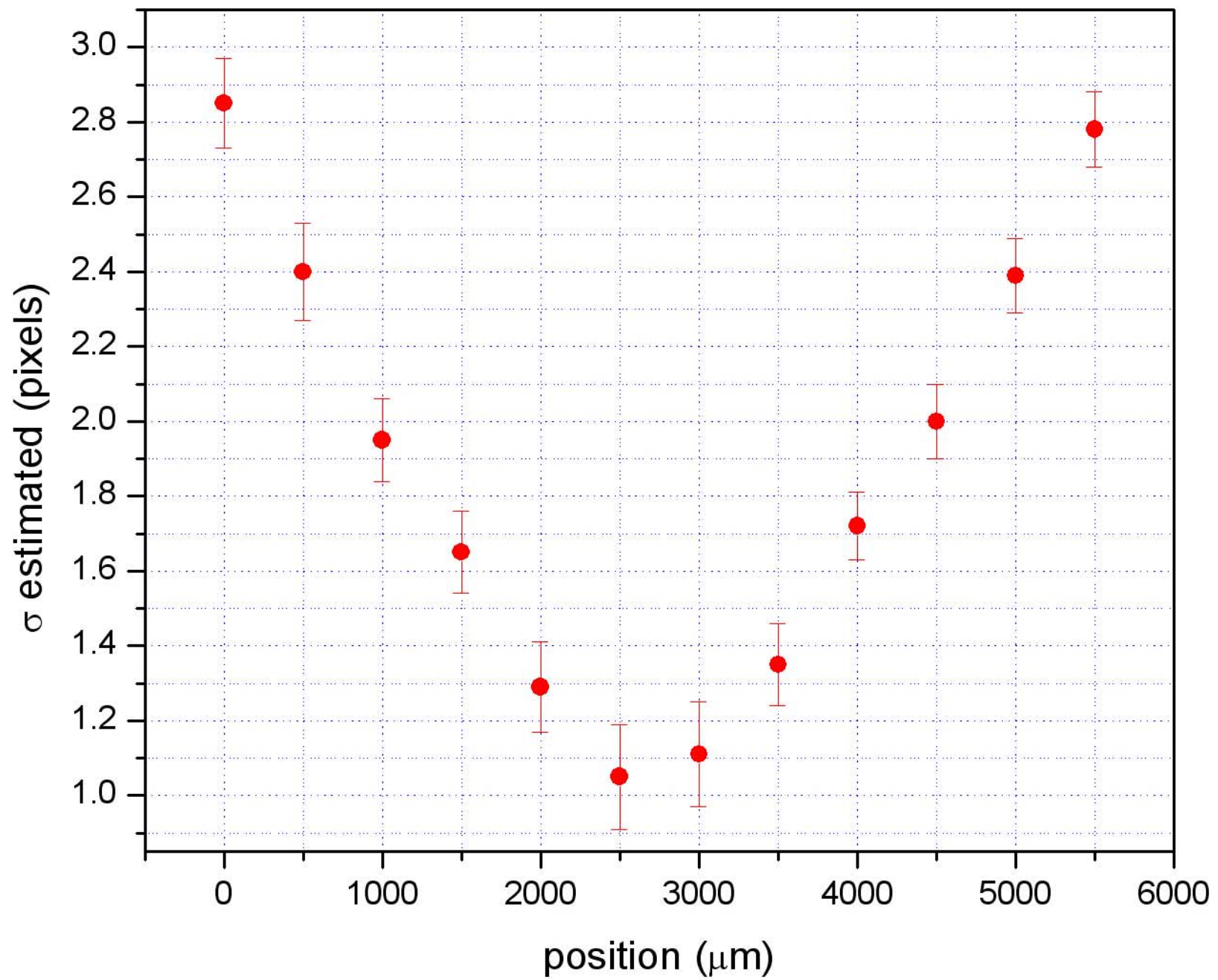
Calibration Screen



Calibration screens as seen by the different magnifications



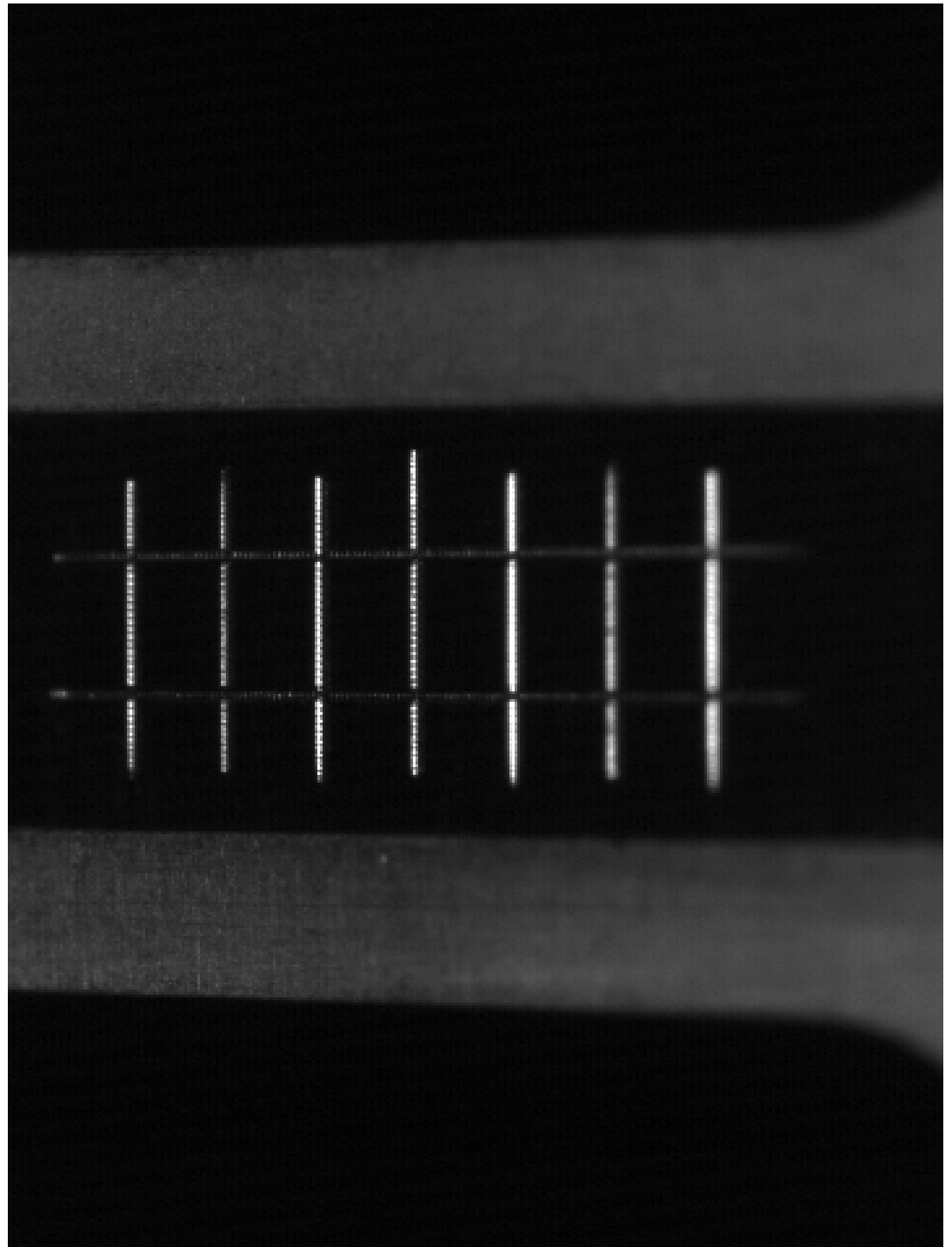
Depth of field



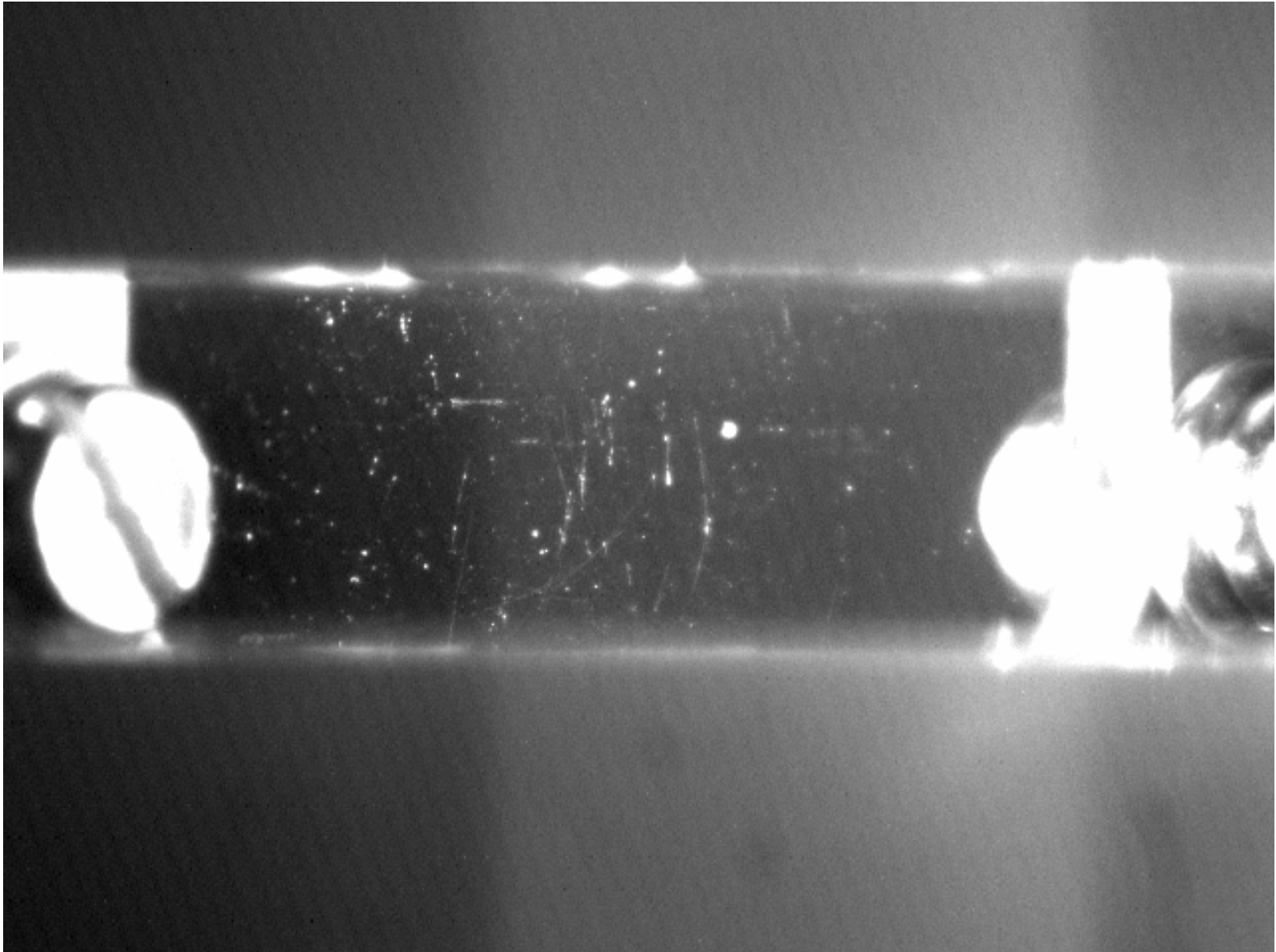
Bypass Camera




Bypass
Calibration
Screen



BC3 Small Screen

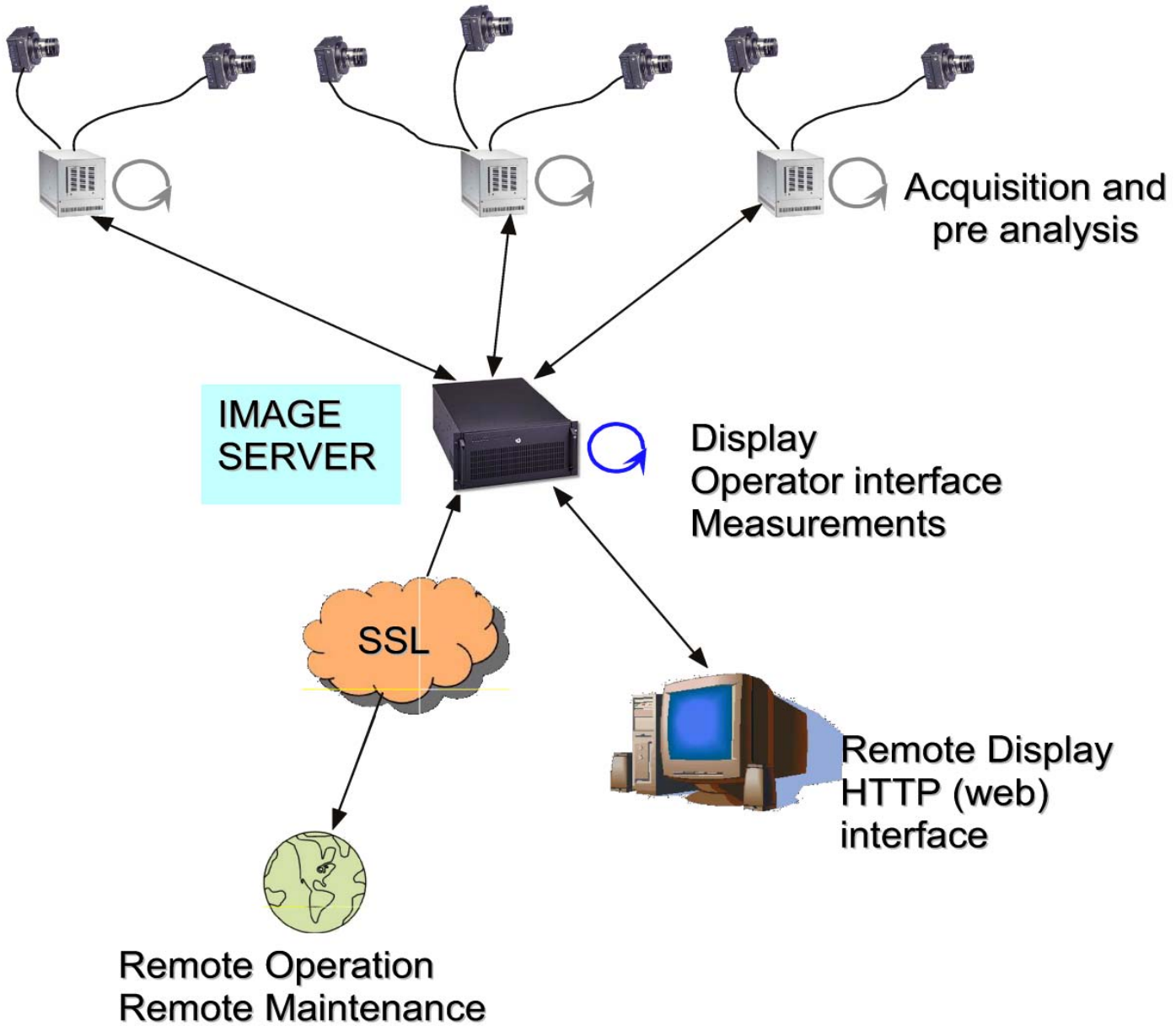


A Qualification Card for each optical System

	TTF 2 Optical System			
	ID system card			
System serial number			04	
Camera serial number			49289	
Distance table				
Lens 1 - CCD		Lens 2 - CCD		Lens 3 - CCD
45,636		23,504		15,795
Alignment data				
	Lasers	Lens 1	Lens 2	Lens 3
x	320	325	330	324
y	254	245	253	248
Lens table				
Lens	Magnification (theoretical)	Magnification (mounted)	Resolution (μm)	Diaphragm \varnothing (mm)
1	1,00	1,00	11 \pm 1	20
2	0,39	0,39	28,1 \pm 0.5	23
3	0,25	0,24	48 \pm 2	37
Annotation, operator and date				
Electronic box			3	

Back of the Industrial PC





Camera Control Panel

The screenshot displays the BeamImage_VIserver_1.1.3.vi software interface, which is used for controlling a camera. The interface is divided into several sections:

- Top Menu:** File, Edit, Operate, Tools, Browse, Window, Help.
- Left Panel (9DUMP):** Displays system information and acquisition parameters:
 - 02-09-2004, 10:56:02
 - shutter = 500.000000
 - brightness = 425.000000
 - v_mode = FALSE
 - t_mode = non-triggered
 - cam_on = FALSE
 - lgt_on = FALSE
 - magnif = 0.000000
 - atten = 1.000000
 - values in pixel
 - x0 = 319.695068
 - y0 = 239.496002
 - sigma x = 184.949890
 - sigma y = 138.564133
 - fwhm_x = 641.000000
 - fwhm_y = 481.000000
- CameraClient_1.1.vi (Sub-window):** Controls the selected camera (9DUMP).
 - Selected Camera:** 9DUMP (dropdown menu).
 - Buttons:** Acquire, StopCamera ACquisition, SNAP, STOP.
 - Parameters:** TRIG (checkbox), GRAB (checkbox), error (checkbox), displayImage (checkbox), Acquisition Speed (f/s) = 5.49451.
 - Sliders and Readouts:**
 - Brightness:** Slider from 0 to 511, readout 425.
 - Gain:** Slider from 0 to 213, readout 154.
 - Shutter:** Slider from 0 to 4095, readout 500.
 - Other:** getCameraAttribute ->, Edit Pref File, Camera status, Initialize CPU.
- Right Panel (Image Options):** Controls image display and processing.
 - Image Options:** FULL IMAGE (button), SUBTRACT Bkgnd (button), LEARN Auto ROI shape (button).
 - Display Options:** SET Background (button), SHOW Bkgnd (button), SHOW AutoROI shape (button).
 - Image_buttons:** Gray (dropdown), palette (dropdown), intensity (slider), frame_visible (checkbox), frame_color (dropdown).
 - History:** x0, y0, Sx, Sy (checkboxes).
 - Buffer:** Buffer (slider) = 200, Amplitude (slider) = 40.
 - show FWHM frame:** (checkbox).
 - Save Image as..** (dropdown), Save Raw Beam Image as.. (dropdown), Update Display (checkbox), Print Image (button).
 - Bottom Buttons:** CLOSE Panel, Show Panel CameraCl.

Hardware

- 8 tunnel computer
Industrial PC with Pentium III 1.3 GHz,
256 MB of ram, Ethernet interface and
up to 9 IEEE1394 ports;
- 1 Image Server
Industrial PC with Pentium IV 2.4 GHz,
512 MB ram and 2 Ethernet interface





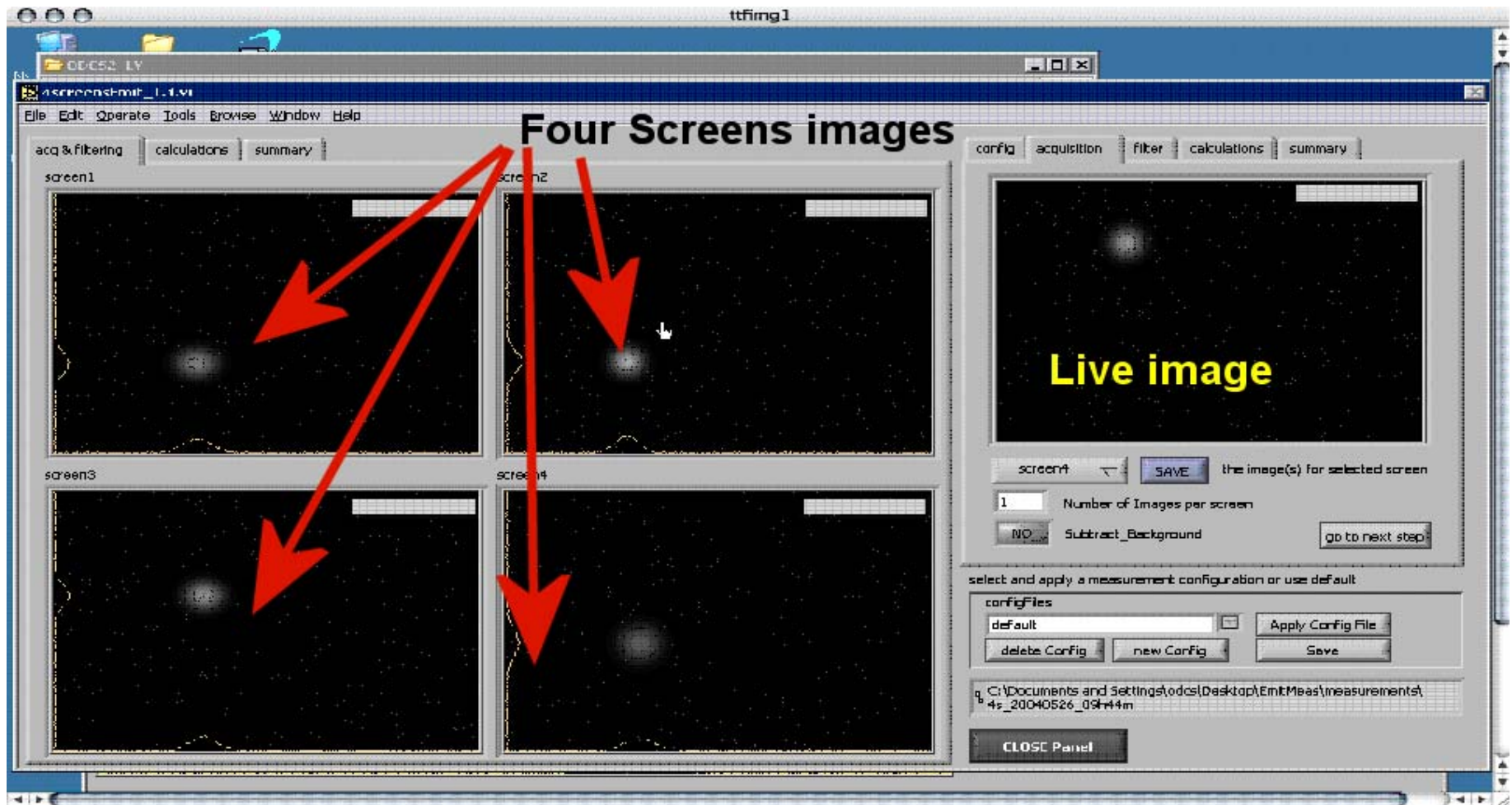
Remote Maintenance

- ssh to local server + rdesktop
- slow and some difficulties with some X-clients
 - ssl tunnel on port 3389 (RDP)
 - a little bit faster
- reasonably simple if Remote Desktop Connection on localhost
- RDC client on Windows does not allow connection on localhost
 - VPN to DESY
- OK! (DESY central computing account needed)

Remote “shifts”

- same as for maintenance + X11 session
- + VRVS conference room (must be booked in advance)
- + tunnel to other ports needed (es. 80)

Emittance Measurement with the 4 Screens method



Problems

The only problem encountered so far has been an occasional “hanging” of a camera, showing only half of the screen or only some lines.

The cure was to disconnect and reconnect the camera, implying the entering into the tunnel.

We have developed a small circuit that intercept the camera power lines of the fire wire cable and can switch it off and on again.

We think that this will solve the problem, and will be tested in the next run, because we could never reproduce this “hanging” in our laboratory.

The camera producer, Basler, has suggested that the cause could be the electromagnetic noise of the environment, and a not perfect shielding of the long fire wire cables.

A couple of more shielded, and more expensive, cables will be tested in the next run.