LENTINO

SpotOptics

The software people for optics

LENTINO

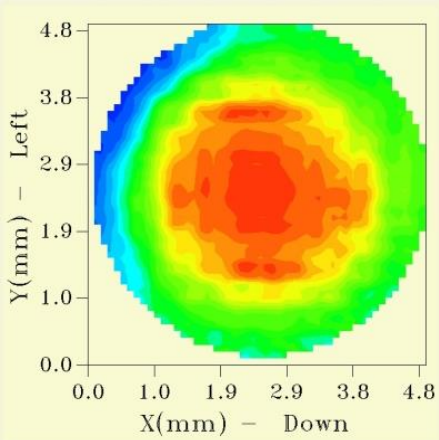
AUTOMATED WAVEFRONT SENSOR

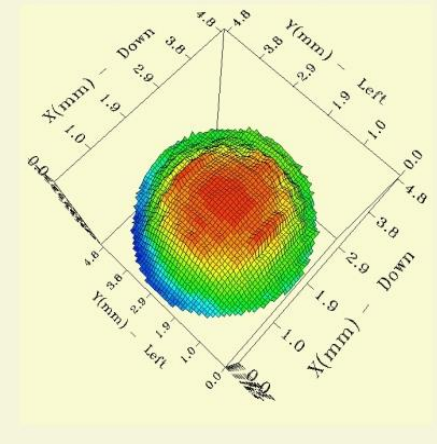
- **Accurate Metrology of standard and aspherical lenses**
- **ϕ=0.3 to ϕ=20 mm**
- **F/1 to F/15**
- **Accurate motor for z-movement**
- **Accurate XY and tilt stages for easy centering of lenses**

TECHNICAL SPECIFICATIONS

Focal ratios covered	f/1 to f/15 standard
Diameter of lens that can be tested in parallel light	20mm
Diameter of lens that can be tested with pinhole at focus	15mm
No of spots (with standard camera)	23x23
Maximum no. of spots (large format camera)	80x80
Diameter and focal length of standard lenslets	(0.2,11),(0.2,22),(0.3,41) mm
Measure aspherical elements	~15% variation in longitudinal spherical aberration
RMS repeatability of computation of Zernike polynomials	1-2nm rms (λ/600-λ/300) at 633nm
RMS repeatability of wavefront measurements	< λ/200
Accuracy	λ/10- λ/100 – depending on the accuracy of the calibration elements
Dynamic range of measurements sub-pupil (tilt subtracted)	-±50 λ
Wavelength range	UV (0.193-1.1µ), Vis (0.193-1.1µ), 0.95-1.7µ
Light sources	LEDs, LDs and Halogen lamps available (at one wavelength or in white light)
Software (control and analysis)	Sensoft
Camera - connections	Cameras with Gigabit and USB2 and USB3 connection available. 10-bits to 16-bits
Acquisition speed	15-500Hz (camera dependent)
Processing speed	5-150 Hz (camera and PC dependent)
Power requirement for stepper motor	24V/2A DC

SENSOFT: THE SOFTWARE





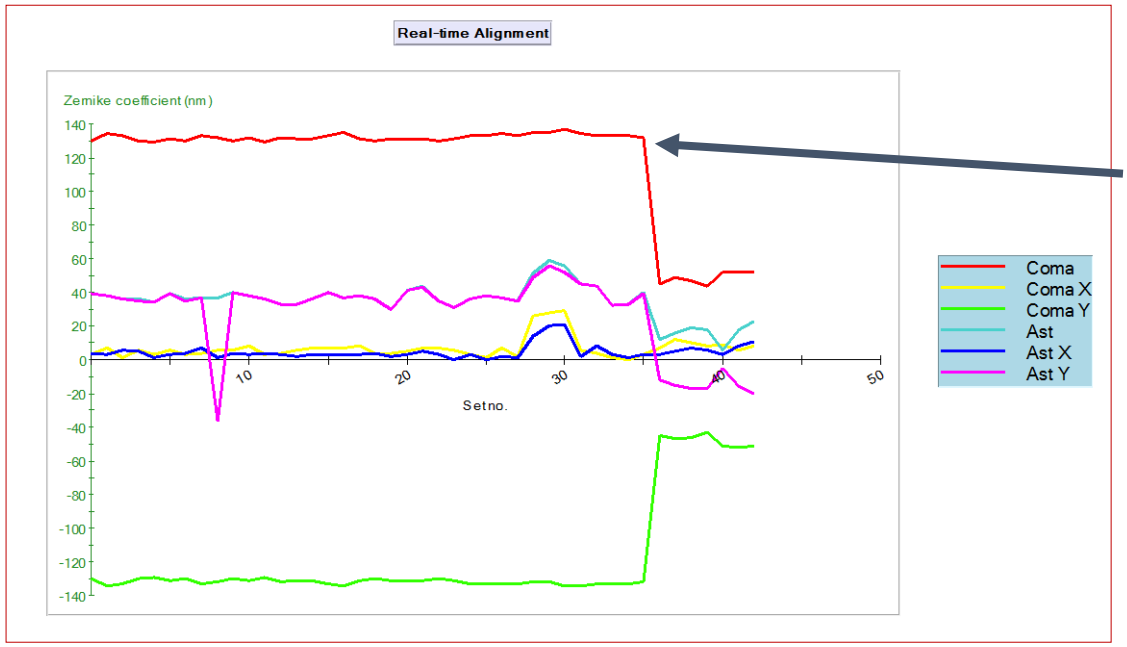
Sensoft: The modular software package:

- Fully controls the hardware of Lentino
- Performs the Shack-Hartmann (SH) analysis
- Computes Zernike cefficients, diagnostics (alignment and correct focal plane), wavefront, MTF, spot diagram
- Has a Loop mode for on-line adjustment of optical system

Lentino in your production line:

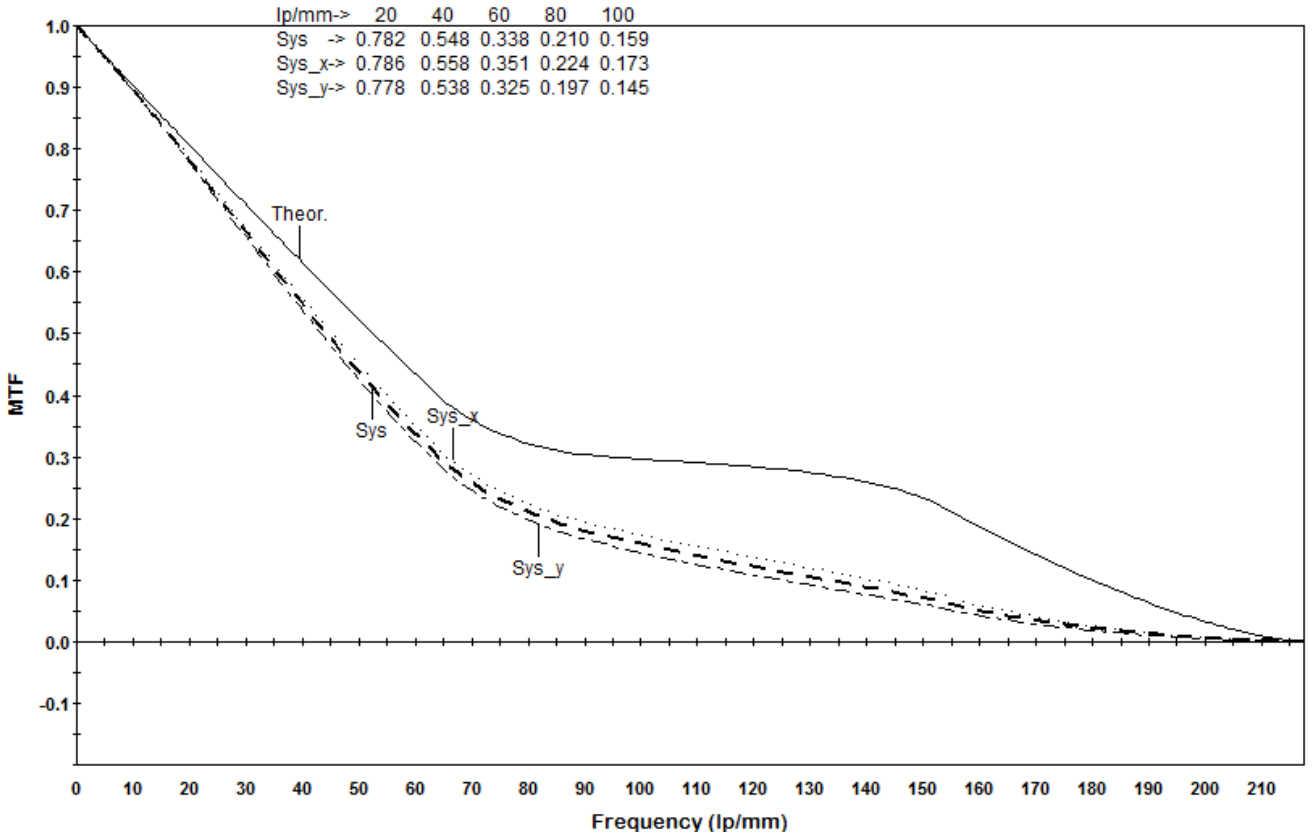
- Lentino – with its own PC - can easily be adapted to the production line
- It can work in a closed-loop with the PC of the manufacturing machine
- A software module defines the communication protocol and transfers the results between the PCs

ON-LINE ALIGNMENT OF COMPLEX OPTICAL SYSTEM IN A FAST LOOP



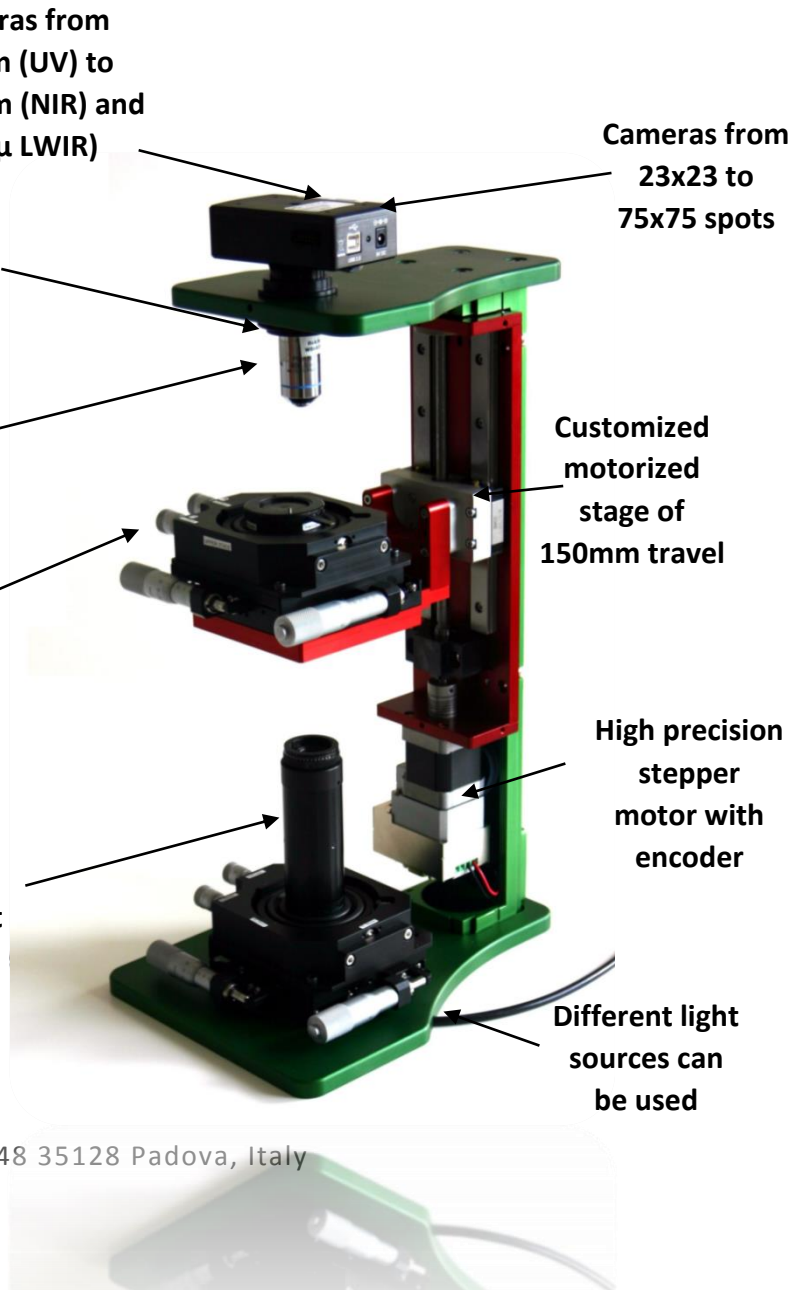
- The alignment of complex optical systems becomes easy by monitoring coma and astigmatism in a continuous loop
- The individual (x, y) components of coma and astigmatism, as well as the total coefficients are displayed
- The optimization can be done for one component at a time, as the software can display one component of interest
- Optimal alignment is reached when the coma and astigmatism components converge towards a given tolerance

MTF MEASUREMENTS



MTF after subtracting the contributions of tilt and defocus present in the data

LAYOUT



PHYSICAL

Dimensions: 20 (L) x 29 (W) x 45 (H) cm
Weight: ~5 Kg
Cameras: USB3, Gigabit Ethernet
Motor power supply: 24V, 2A

KEY FEATURES

Measurement technique
Shack-Hartmann wavefront sensor
Test in parallel light or at the lens focus
Parallel light (with a collimator)
At the focus of the lens (with a pinhole)
Light sources with different wavelength available
Calibration
High-quality parallel light source
Pinhole calibration unit
Easy access to optical elements
Easy access to optical group for on-line alignment

SOFTWARE

Easy alignment of lens group via software: the software gives graphical indication of the misalignment of the optical system, using coma and astigmatism.

May 2014