OMI-CMOS-DUV

SpotOptics s.r.l. – leaders in accurate metrology

OMI-CMOS-DUV to NIR

VERSATILE WAVEFRONT SENSOR

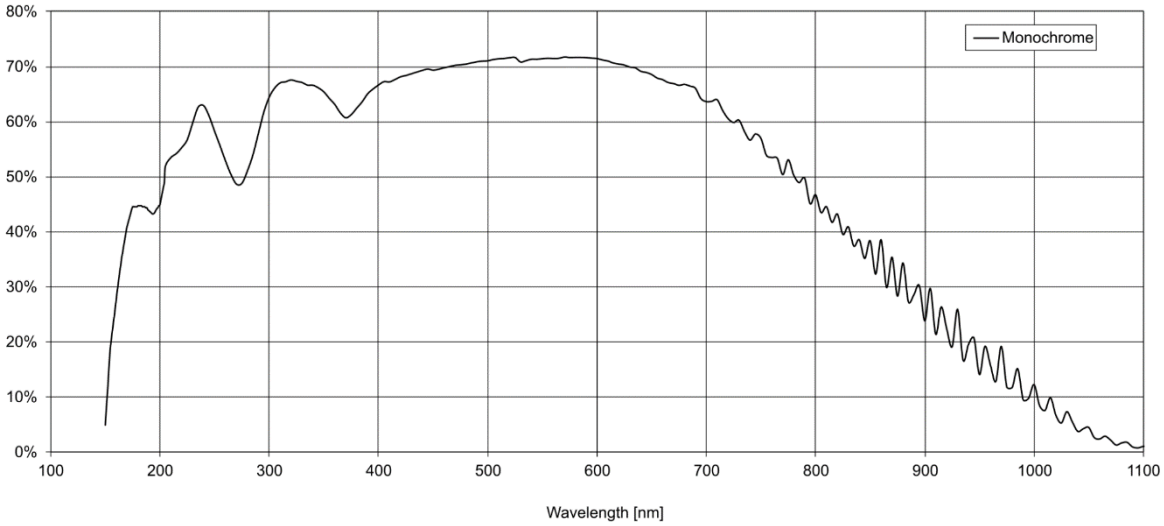
- Accurate metrology in single pass
- Optical elements, lasers and laser diodes
- Test any focal length and diameter (with accessories)
- Large dynamic range
- For R&D and production
- Optimized for DUV->NIR wavelength ranges (170-1000nm)

More than 25 years' experience in accurate metrology

TECHNICAL SPECIFICATIONS	
HARDWARE	
Test	Optical elements, lasers and laser diodes
Power of laser diode that can be tested	Few mW. Higher powers require a power reduction system (available)
No of spots (see cameras below)	35x35 (DUV-VIS-NIR) for a pupil size of 7mm
Diameter and focal length of standard lenslet arrays	• ϕ=0.2mm, f=22mm– for UV-Vis region from 170-750nm • ϕ=0.2mm, f=11mm - for NIR region – from 751-1000nm • Other lenslet arrays with smaller diameter and/or shorter focal length are available on request
SOFTWARE	
Software (control and analysis)	Sensoft for 64bit Win 10
ACCURACY AND REPETABILITY	
Resolution	1nm
RMS repeatability of Zernike coefficients (zonal wavefront)	<2nm rms
RMS repeatability of modal wavefront measurements	< λ/100
Accuracy and dynamic range	λ/20- λ/100 (calibration dependent), -±50 λ
CAMERA	
Detector, wavelength range and cooling	CMOS BSI technology (DUV-VIS-NIR). Quantum efficiency: Over 40 % at 200 nm, < 70 % at 650 nm. Uncooled
Chip size, pixel size	1280 x 1024 pixels, each of 7.4 μm. 9.5 x 7.6 mm^2
Connection, A/D convertor bits	Gigabit Ethernet, 12-bits
Acquisition speed and Frame transfer	28 Hz, global shutter
Triggering	Yes: external Trigger, SW Trigger
Exposure time (min, max)	280 μs, 559 msec
ACCESSORIES	
Light sources, beam expanders and compressors	High quality LD with lens at test wavelength, beam expanders/compressors

OMI DUV-VIS-NIR (from 193nm-1100nm)

Quantum Efficiency Image Sensor



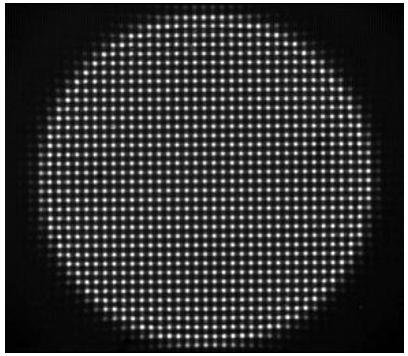
Quantum efficiency curve of CMOS

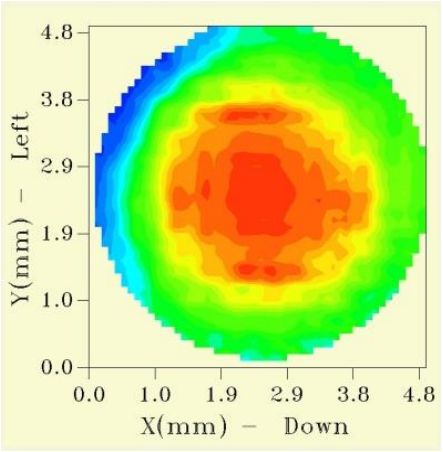
Other details

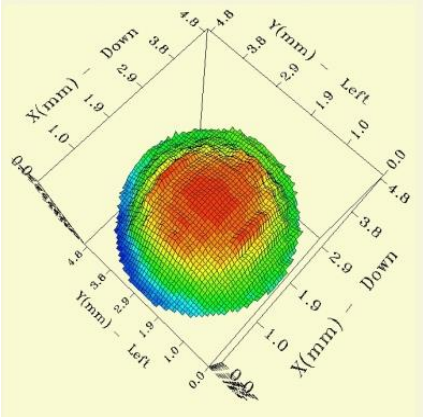
- Resolution: 1280 x 1024 pixels
- Pixel size: 7.4 µm x 7.4 µm
- Chip size: 9.47 mm x 7.58mm
- Image rate: 28hz (full resolution)
- Max. exp. time: 559 msec
- Connection: 10GigaEthernet

Other details

- Resolution: 35x35 spots (max)
- Lenslet pitch and focal length (UV and VIS):0.2mm, 22mm
- Lenslet pitch and focal length (NIR):0.2mm, 11mm
- Calibration unit for parallel light: Static or motorized high-quality collimator with LD/LED at test wavelength
- Motor step: 2.5µm







SENSOFT: THE SOFTWARE

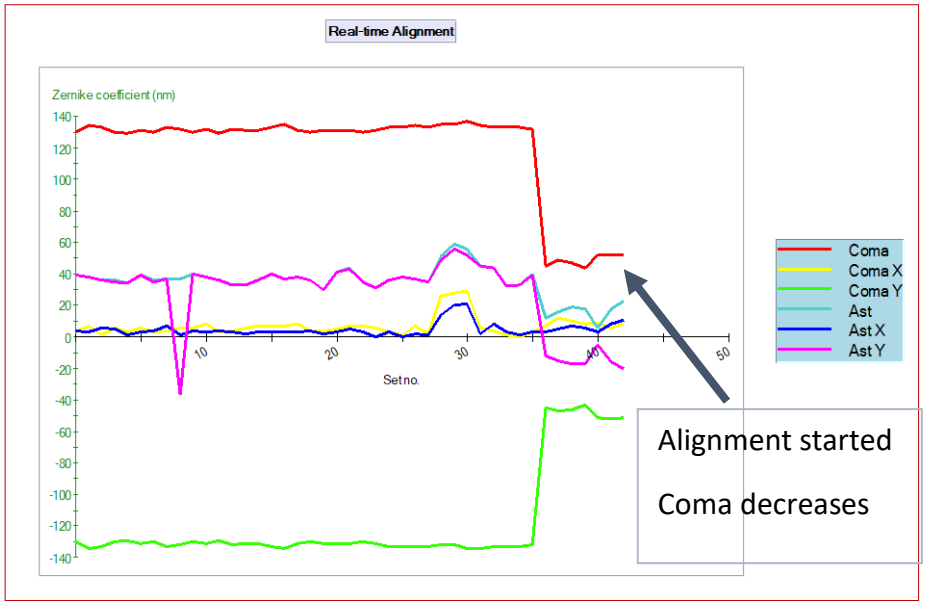
Sensoft: The modular software package

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

OMI in your production line:

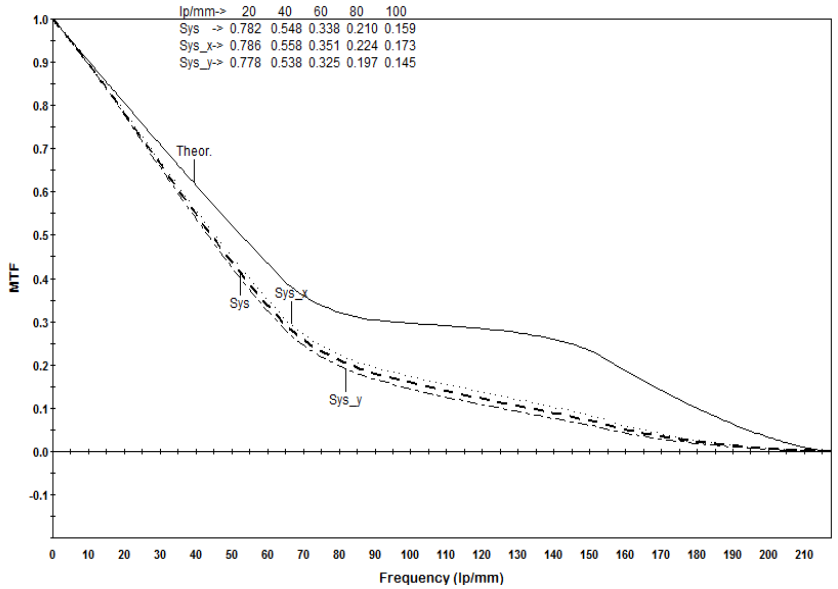
- OMI – with its own PC - can easily be adapted to the production line
- It can work in a closed-loop with the PC of the manufacturing machine
- A software module defines the IP communication protocol and transfers the results between the PCs in the Local Area Network

ON-LINE ALIGNMENT 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

MTF MEASUREMENTS



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

OMI with CMOS-DUV CAMERA

OMI

- **fl=22mm, ϕ= 0.2mm for UV-Vis (170-750nm)**
- **fl=11mm, ϕ= 0.2mm for NIR (750-1000nm)**
- **Max. Resolution 35x35 spots for a pupil size of 7mm**

PHYSICAL

Camera:
CMOS, 10GigE (170-1000nm), Global shutter
Chip size: 1280x1024x7.4µ pixels, 9.47.x7.58 mm^2
Dimensions: 59 (L) x 59 (W) x 102 (H) mm
Weight: 460 gm

KEY FEATURES

Measurement technique
Shack-Hartmann wavefront sensor
Test in parallel light or at the lens focus in single pass
Parallel light (with a calibration unit)
At the focus of the lens (with pinhole calibration unit)
Light sources with different wavelength available
Calibration units available
High-quality parallel light source (motorized or manual)
Pinhole calibration unit
Accessories
Light sources and beam expanders/compressors. Collimators

SOFTWARE

- Full waterfront analysis: Zernikes, zonal and modal WF, Spot diagram, MTF, EE, PSF, M^2
- Easy alignment of lens group via software: graphical indication for correction using coma and astigmatism
- Stabilization of lasers: graphical indication of focusing of laser beam