Wave Front Sensor

SID4 wavefront sensor genuine features

- High resolution (160x120 points)
- Achromaticity
- High stability of the measurement
- Insensitive to vibration
- Ease of use, Firewire IEEE 1394
- Compactness : controlled with laptop

SID4 technological advantages

SID4 wavefront sensor gives a phase and intensity map sampled on 160x120 measurement points and offers to the user a precise laser beam analysis.
From high resolution results:

- High measurement reproducibility,
- A precise and rigorous optical aberration evaluation (Zernike, Legendre).

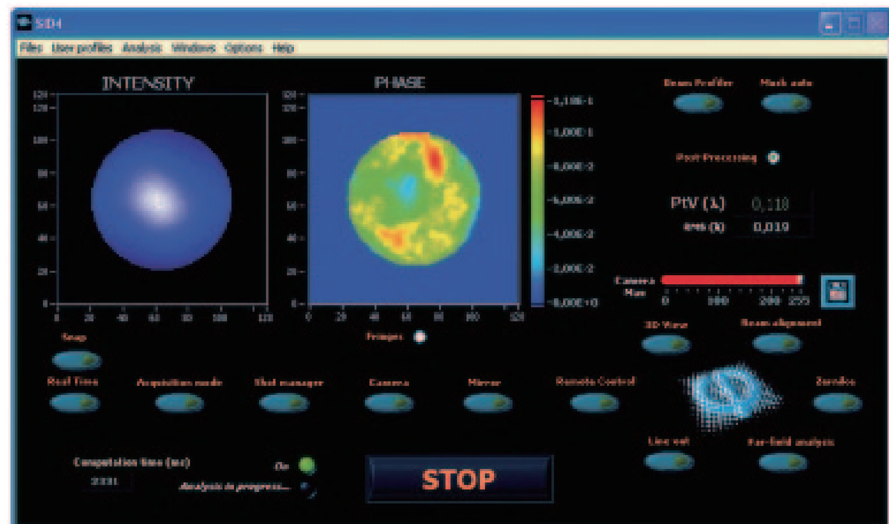
- Our lateral shearing interferometry technology ensures high accuracy measurements.
- Modified Hartmann mask is achromatic, measurement in coherent and incoherent light are possible (laser, LED, halogen source...).
- SID4 wavefront sensor does not need an elaborate alignment procedure. Tilt measurement is independant of the global wavefront measurement.
- SID4 is insensitive to energy variations. Measurement is independent of intensities modulation of the analyzed source in the sensitivity range of the camera.
- Ergonomics, SID4 is easy and quick to implement.
- SID4 wavefront sensor only needs a workshop calibration without any posterior calibration cheking.
- SID4 is self referenced and so insensitive to vibrations.
- SID4 includes an intuitive software with a fast and robust analysis method.

Software for laser metrology

SID4 wavefront sensors are associated with a complete electromagnetic field analysis software. It integrates a high resolution phase map and at the same time the intensity profile and the phase map.

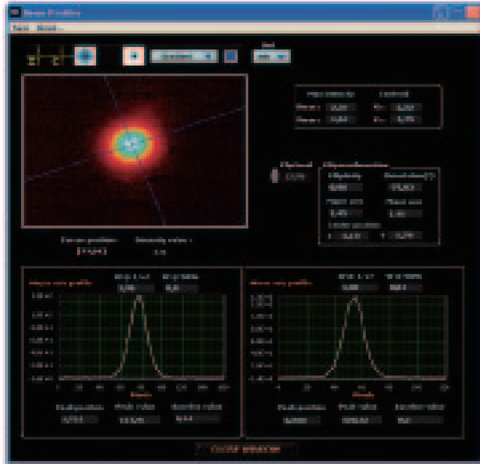
Software description

- Phase interpretation modules
  - Tilt
  - Divergence
  - Zernike polynomials
  - Legendre polynomials
  - Beam alignment assistant
- Ergonomics
  - Intuitive software
  - Multi-user interface
  - Automatic mask adjustement
- Laser beam analysis
  - Phase and Intensity
  - M² measurement
  - Strehl Ratio
  - Far-Field analysis
- Beam View (option)
  - Complete beam analysis
  - Intensity profiles
  - Gaussian fit



Software advantages for laser metrology

- SID4 high resolution offers an accurate analysis of the results
- Software analyses circular or rectangular pupils and automatically adapts to the right projection base: Zernike or Legendre
- SID4 lateral shearing interferometry technology allows an easy alignment procedure: Fourier Transform analysis strongly reduces tip/tilt alignment
- Different users measurement parameters are associated with a specific profile allowing a multi-user access
- With programming module library (Software Development Kit) in Labview and C++, you can include phase measurement and various interpretation modules in your own programs for a customized use



Beamview

With Beamview, SID4 allows at the same time strong laser beam wavefront and intensity profiles.

This feature in the software enables making an intensity profile characterization. It gives the following information :

- Position of intensity maximum from camera centre (in mm,µm)
- Position of intensity centroid from camera centre (in mm,µm)
- Beam diameter at 1/e², FWHM
- Ellipticity, angle
- X,Y and arbitrary line-out Gaussian fit
- Results and pictures saved to disk
- Background noise processing

Specifications

	SID4	SID4 HR	SID4 UV-HR	SID4 NIR	SID4 DWIR	SID4 LWIR-640	SID4 IR-MCT
Aperture dimension	3.6 x 4.8 mm²	8.9 x 11.8 mm²	8.0 x 8.0 mm²	3.6 x 4.8 mm²	13.44 x 10.08 mm²	16 x 12 mm²	9.60 x 7.68 mm²
Maximum aperture	-	-	-	-	-	-	F/1
Spatial resolution	29.6 µm	29.6 µm	32 µm	29.6 µm	140 µm	100 µm	60 µm
Sampling	160 x 120 (> 19 000 points)	300 x 400 (>120 000 points)	250 x 250	160 x 120	96 x 72	160 x 120	160 x 128
Wavelength range	350 nm to 1100 nm	350 nm to 1100 nm	190 - 400 nm	1.5 - 1.6 µm	3 - 5 µm and 8 - 14 µm	8 - 14 µm	1.2 - 5.5 µm
Accuracy	-	-	10 nm RMS (absolute)	> 15 nm RMS	75 nm RMS	75 nm RMS / 25 nm RMS (absolute / relative mode)	-
Precision (absolute / relative)	10 nm RMS / 3 nm RMS	10 nm RMS / 2 nm RMS	-	-	-	-	-
Repeatability	3 nm RMS	2 nm RMS	-	-	-	-	-
Sensitivity	-	-	0.5 nm RMS	< 11 nm RMS	25 nm RMS	25 nm RMS	3 nm RMS @ 3µ>/cm²
Dynamic	> 100 µm	> 500 µm	>200µm	> 100 µm	-	-	>300 µm (Dynamic range)
Acquisition frequency	60 fps	10 fps	-	-	-	-	-
Real-time processing frequency	> 10 fps (full resolution)	> 3 fps (full resolution)	-	-	-	-	-
Sensitivity curvature measurement	-	-	<5. 10-4 m-1	-	-	-	-
Analysis rate	-	-	1 fps	< 10 fps	20 fps	24 fps	>20 fps (full resolution)
Acquisition rate	-	-	30 fps	60 fps	50 fps	50 fps	140 fps
Detection technology	-	-	-	-	-	-	Cooled MCT
Dimensions (l x H x L)	49 x 35 x 110 mm	76 x 63 x 132 mm	95 x 105 x 84 mm	44 x 33 x 57.5 mm	85 x 116 x 179 mm	96 x 110 x 90 mm	135 x 140 x 240 mm
Weight	250 g	620 g	900 g	250 g	Approx. 1.6kg	850 g	~3.5 kg