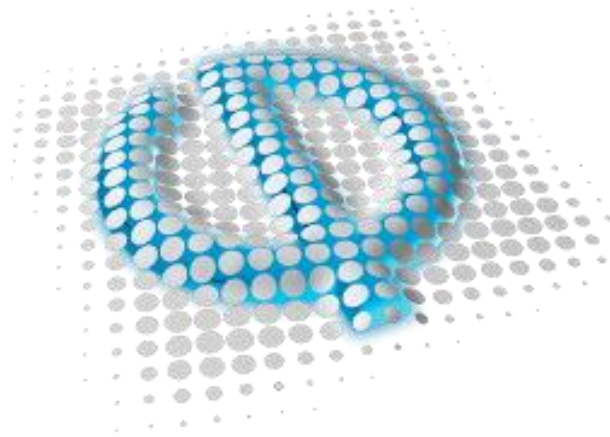


Innovative Wavefront Sensing Technology



PHASICS
the phase control company

LASER



Laser Beam Characterization

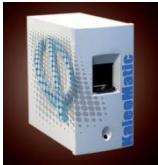
Phase/Intensity, M^2 , Waist position/size, Zernike/Legendre coeff.



Adaptive Optics

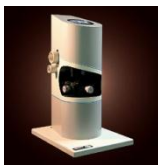
Focal spot optimization, Beam shaping

OPTICS



Optic Surface Characterization

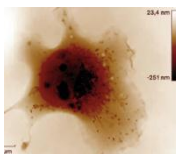
Surface quality (RMS, PtV, WFE), Radius of curvature



Optics Quality Characterization

MTF, PSF, EFL, Zernike coefficients

BIO



Biological Imaging

Quantitative Phase Imaging

SID4 Wavefront Sensors



UV



SID4UV-HR, SID4-UV-GE
Lasers, Wafer inspection

193-400 nm
250x250
0.5 nm sensitivity

Visible and NIR



SID4, SID4HR, SID4BIO
Lasers, Metrology, Imaging

400-1100 nm
up to 400x300
1 nm sensitivity



SID4-NIR
Telecom lasers @ 1,55 μm

1,55 μm
160x120
3 nm sensitivity

IR



SID4-LWIR, SID4-DWIR
IR objectives, CO2 lasers

3-14 μm (II and III bands)
96x72
10 nm sensitivity

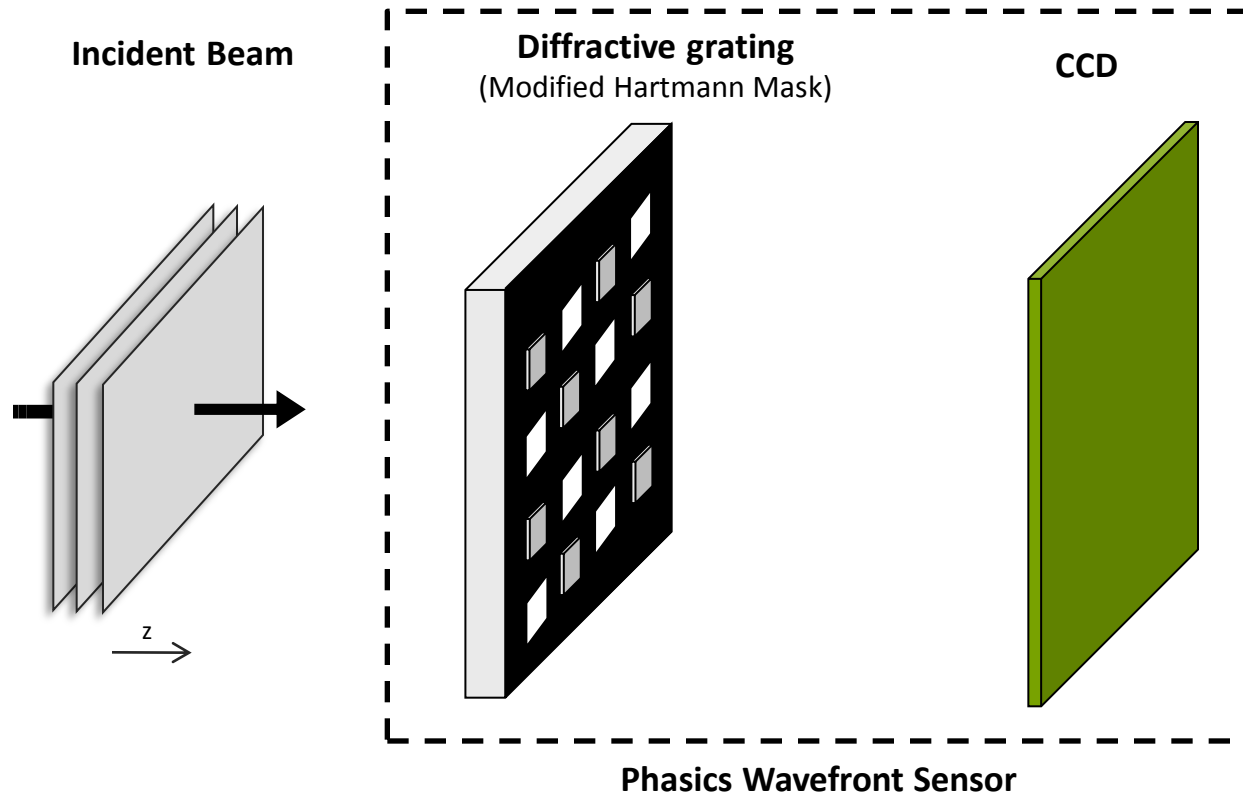
The Technology:

« *4-Wave Lateral Shearing Interferometry* »

How it works

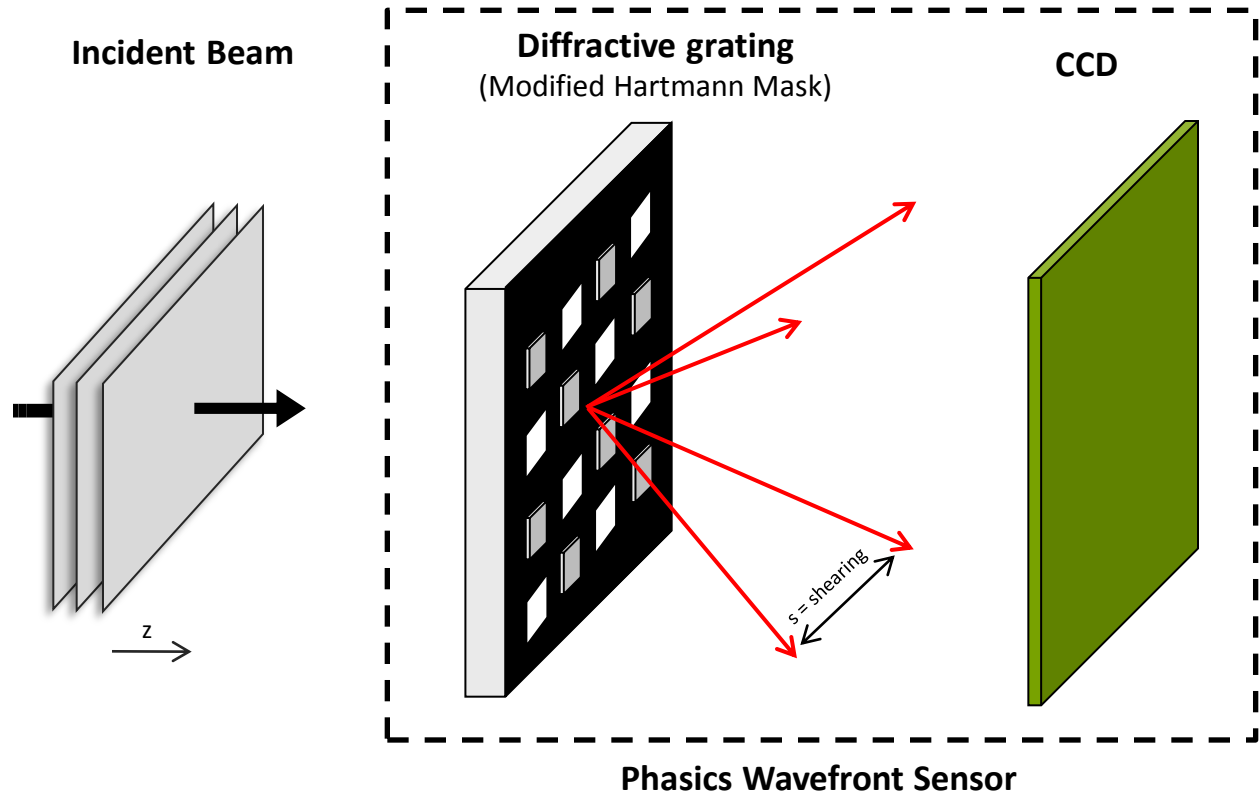
The advantages

How It Works



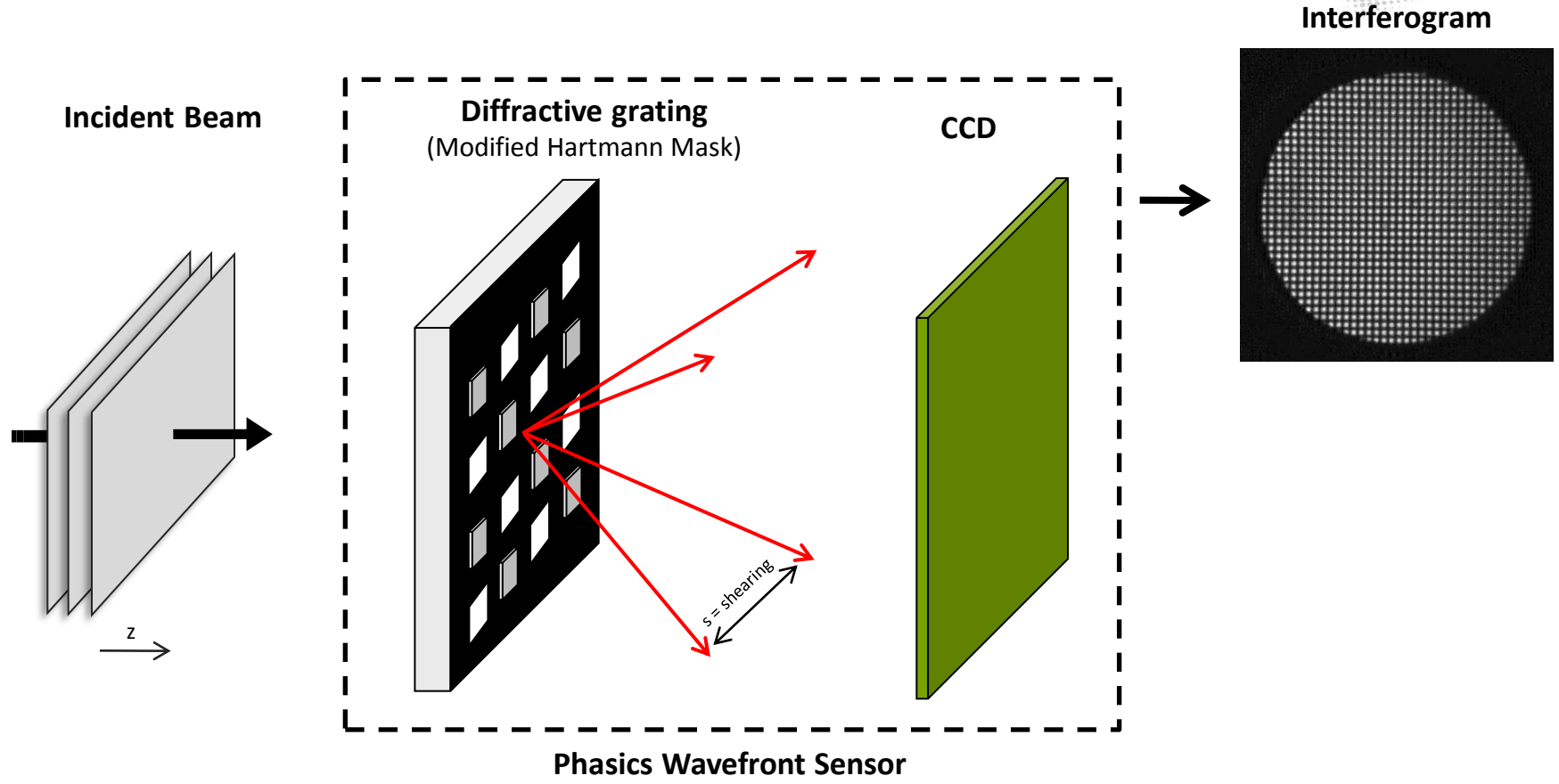
1. The incident wavefront is sampled through the diffractive grating.

How It Works



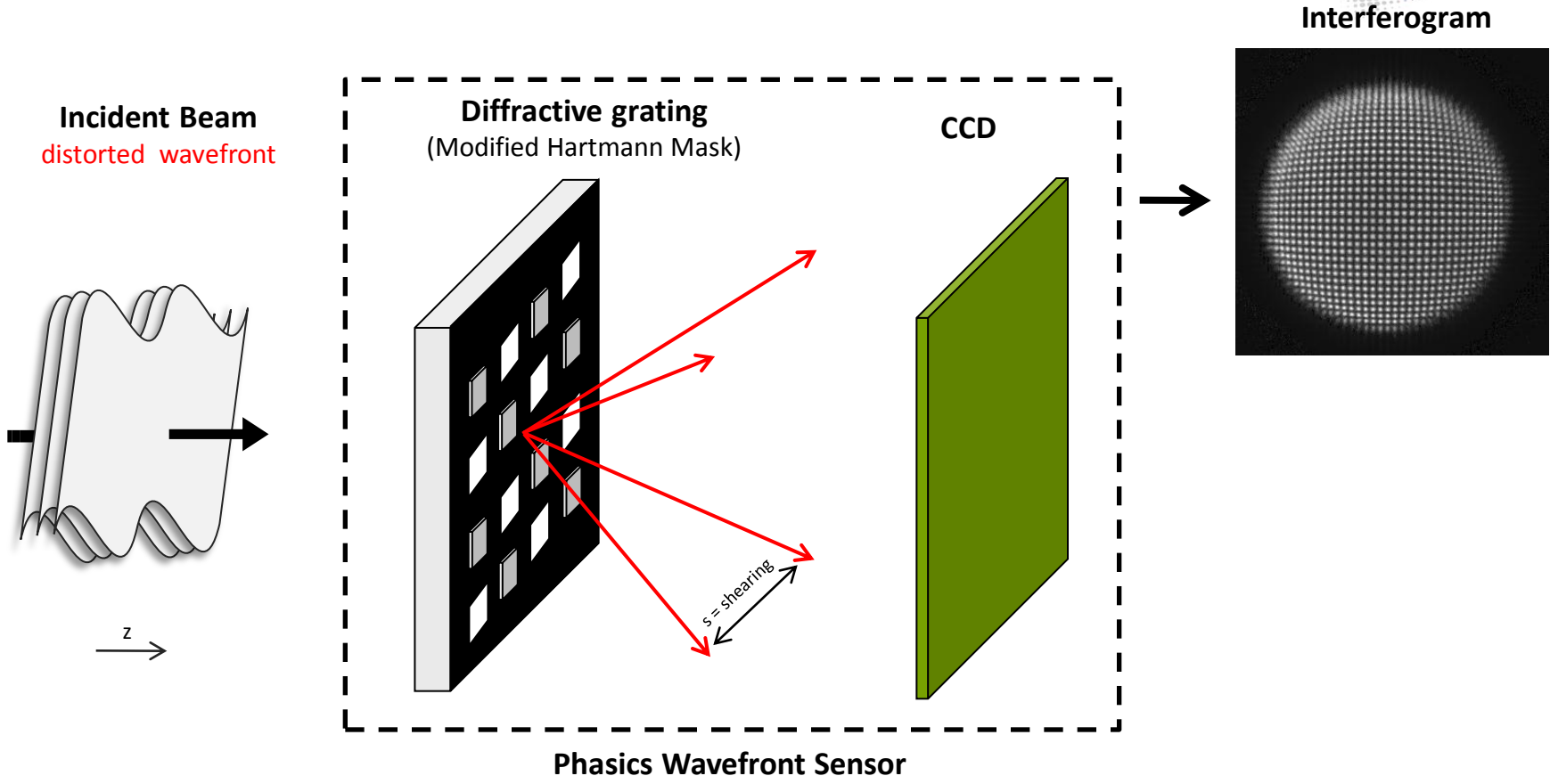
2. The diffraction grating replicates the incident beam into 4 identical waves which are propagated along slightly different directions.

How It Works



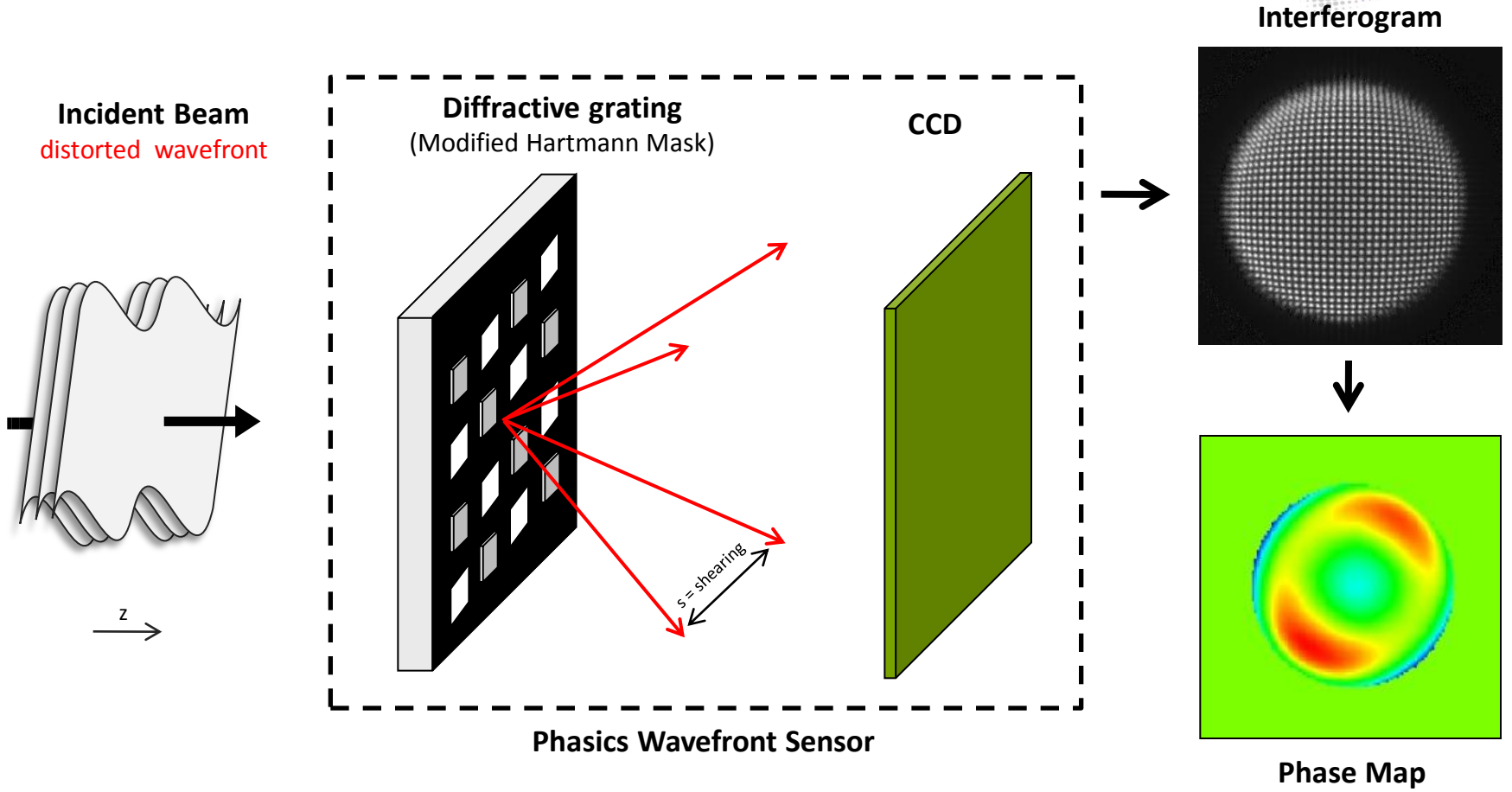
3. The direction differences create interference patterns. In our case, this is made of sinusoidal fringes.

How It Works



4. When aberrations are present on the beam, the interference grid is distorted.

How It Works



5. A spectral analysis using Fourier transform allows the phase gradient extraction in 2 orthogonal directions. The phase map is finally obtained by integration of these gradients.

The Advantages

✓ **High Resolution** Up to 300x400 measurement points

✓ **Achromaticity** Perfect for short pulses

✓ **High Dynamic** Up to 500 μ m

✓ **UV, Visible, NIR, MWIR and LWIR** (190nm to 14 μ m)

✓ **Easy Setup**

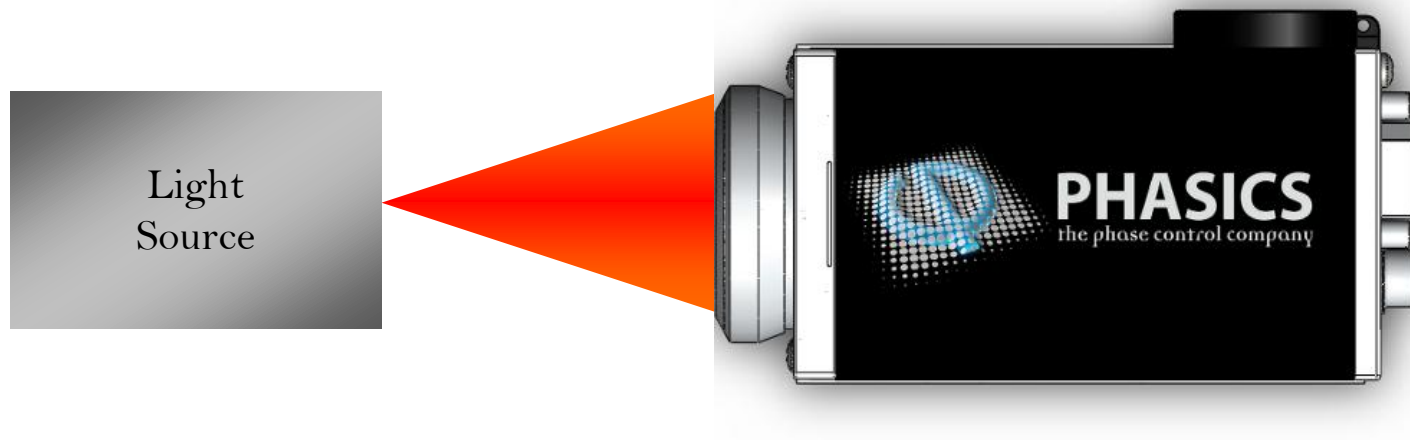
✓ **Achromaticity**

Classical interferometer pitch is strongly dependent on wavelength. In our case, thanks to the use of a diffraction grating, multi-wave lateral shearing interferometers are achromatic : the chromaticity of the grating is exactly compensated by the interference chromaticity. The interferogram pitch is exactly equal to the grating pitch.

Therefore The SID4 wavefront sensors can be used at different wavelength without additional calibration on the whole detection range of the camera. It can be used with polychromatic light, well adapted for short pulses laser.

The Advantages

- ✓ **Direct measurement of divergent beams up to 0.1 NA (0.5 NA optional)**



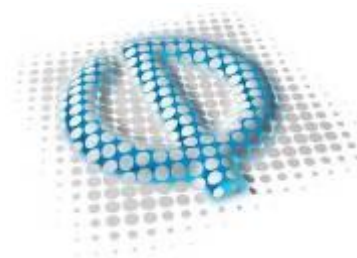
Specifications of SID4 and SID4-HR

	SID4	SID4-HR
Aperture	3,6 x 4,8 mm ²	8,9 x 11,8 mm ²
Spatial resolution	29,6 μm	29,6 μm
Sampling	160 x 120 (>19000 points)	400 x 300 (>120 000 points)
Wavelength	350 nm - 1100 nm	350 nm - 1100 nm
Dynamic	> 100 μm	> 500 μm
Accuracy (absolute - relative)	10 nm RMS – 3 nm RMS	10 nm RMS – 2 nm RMS
Sensitivity	3 nm RMS	2 nm RMS
Acquisition frequency	60 fps	10 fps
Analysis frequency	> 10Hz (High resolution)	> 3Hz (High resolution)
Dimension	49 x 35 x 110 mm	76 x 63 x 132 mm
Weight	250 g	620 g

- 4-Wave Lateral Shearing Interferometry is a powerful tool for complete Laser characterization:
 - High resolution intensity and phase maps
 - Beam parameters and quality : M^2 , Strehl ratio, waist..
 - Zernike coefficients
- Customized solution and adapted advices given by PHASICS

Visit us @

www.phasics.com



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