

Optical Metasurfaces Characterization with high-resolution wavefront sensing solution

Challenges / Goals

Photonic Metasurfaces (ex. Metalenses, Effective-Refractive Index (ERI) metasurface, Pancharatman-Berry (PB) metasurface) are optics with phase shaping properties that are mainly dictated by geometrical parameters and nanostructures arrangement.
Characterizing Metasurfaces with a need for metrological tools that are achromatic and non polarization dependent.



PHASICS specializes in high resolution wavefront sensors from UV to far IR, based on Quadriwave Lateral Shearing Interferometry (QWLSI)

Advantages

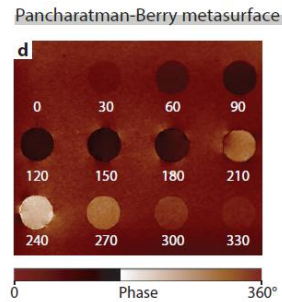
- Fully achromatic
- Non polarization dependant
- High dynamics, resolution and sensitivity
- Easy to integrate (small form factor, vibration independent, plug-and-play on any optical microscope)

Using QWLSI technology, PHASICS proposes the SID4-sC8 wavefront sensor for Metasurfaces Characterization.

Outcomes

Control the metasurfaces fabrication process

- Possible to get phase and intensity-piston metasurfaces images on ERI metasurface and PB metasurface
- Enable to characterize and confirm the metasurfaces manufacturing process



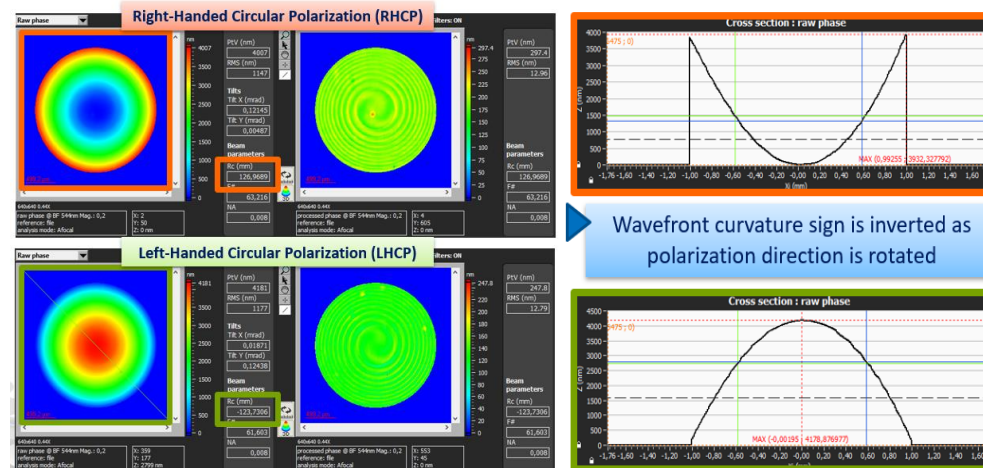
Control the optical function

- Wavefront measurement
- Radii of curvature and wavefront curvature
- Robust PSF and MTF calculations
- Optical aberrations, Zernike analysis

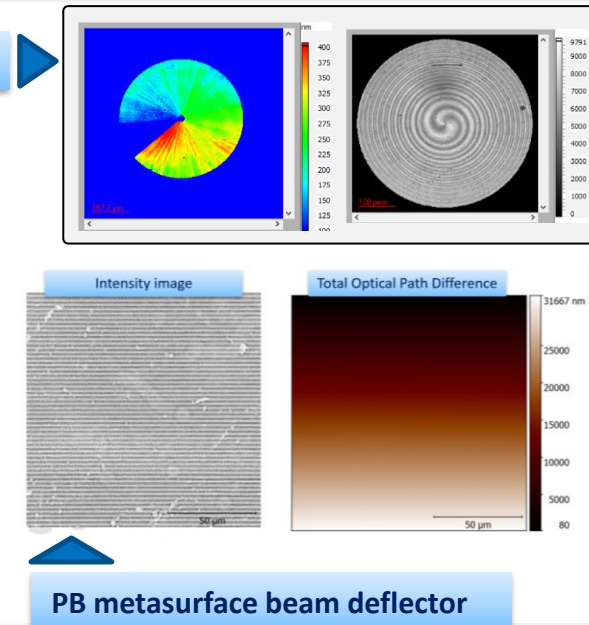
Applications examples

PB metalens: focal length is polarization dependent
QWLSI measurement is polarization independent

Phase vortex



Wavefront curvature sign is inverted as polarization direction is rotated



PB metasurface beam deflector

Thank you! Question?
For more information:
Contact us: contact@phasics.fr

