## Hartmann-Shack Wavefront Sensor



The **Hartmann-Shack** wavefront sensor was especially designed for comprehensive laser beam characterization. It accomplishes prediction of the propagation behavior of laser radiation as well as M<sup>2</sup> determination for coherent sources in real-time: From the simultaneously registered intensity and phase distribution beam profiles can be computed for any location along the beam path, especially the focal plane, by Fresnel-Kirchhoff integration. The propagated profiles show an excellent agreement with directly measured camera data. This is of particular interest in case of very small foci and for fluctuating sources.

## Operation principle

The system uses a micro-lens array for dividing the incoming wave into a large number of sub-rays (cf. figure right). Intensity and position of the individual foci are monitored with a camera, enabling the reconstruction of both **beam profile** and **wavefront** from a single measurement.

These data accomplish real-time evaluation of beam propagation parameters (beam width, divergence, M<sup>2</sup>) which is especially important for pulsed or fluctuating lasers.





- Beam propagation (NIR ... EUV)
- ISO beam parameters
- M<sup>2</sup> in real-time
- Focus monitor
- Optics testing / Zernike analysis
- Adaptive optics

## Features

- All beam parameters from single measurement
- Wide spectral range: 1100 1 nm
- Dynamic range: up to 100 λ (@633 nm)
- Sensitivity (optics testing): < 100 pm
- Various micro-lenses and cameras (12 bit 16 bit)
- USB 3.0 or GigE (ideal for laptop)
- Customized solutions





ProOpto GmbH Hans-Adolf-Krebs-Weg 1 D-37077 Göttingen <u>www.proopto.net</u> Dr. Klaus Mann info@proopto.de Tel: +49-(0)551-5035-41 Fax: +49-(0)551-5035-99