APPLICATIONS

Semiconductor industry
• Control of wafer flatness
• Defect detection
• Inspection of nanotopography
• Support for CMP processes
→ Integrated metrology for advanced process control

Material testing
• Inspection of reflecting surfaces e.g. mirrors, polished metal surfaces, glass plates, etc.
• Determination of surface accuracy

What is your application?

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**PRINCIPLE**

**Wavefront sensing according to Makyoh**
- A plane wavefront provided by a light source is projected on the sample surface
- The topography of the surface determines the deformation of the reflected wavefront
- The intensity distribution of the reflected wavefront is captured by a camera (Makyoh image)
- Using structured illumination, the deformation of the reflected wavefront can be detected
- Thereby, the gradient of the sample surface is calculated
- The sample topography can then be reconstructed from the gradient field using integration algorithms

**CHARACTERIZATION**

**Recent specifications**
- Resolution: < 20 nm vertical, down to 500 µm lateral (ongoing R&D)
- Field of view: 135 mm in diameter
- Large vertical range: height deviations from 20 nm up to 100 µm
- Sufficient reflectivity of the surface is required, however uniform reflectivity is not necessary

**Benefits**
- Compact sensor (prototype available)
- Fast surface analysis
- Contactless and non-destructive
- Simple setup and cost-saving implementation

**SOFTWARE**

**Topography reconstruction**
- Full 3D reconstruction of sample surface
- Height profile analysis
- Defect detection

**Filtering**
- Algorithms for extracting the desired spatial wavelength range from the topography data
- Nanotopography analysis

**Stitching**
- Software for stitching together adjacent topography maps

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2. Makyoh image of semiconductor structures on a Si wafer

3. Height profile of a polished Si wafer

4. Reconstructed nanotopography of a polished Si wafer