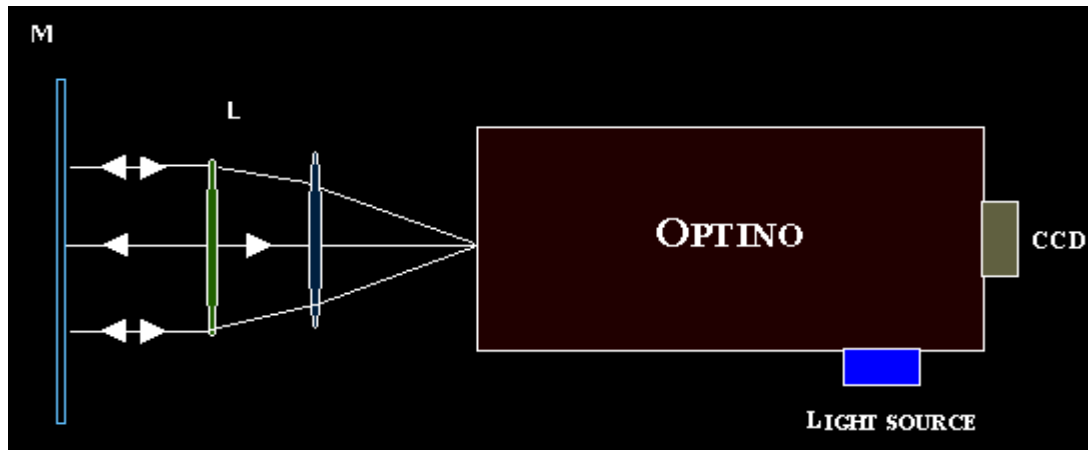


Shack-Hartmann wavefront sensor test of multi-component flat lens



Setup: In the above configuration, diverging light from Optino falls on the lens L under test. It is made parallel by it, and falls on a flat mirror M (which should be of a high quality, say $\lambda/4, \lambda/10$ or $\lambda/20$, depending on the accuracy required for testing the lens L). The light from the mirror M returns to Optino, and passed to the SH system.

The aberrations of the SH system itself are removed taking a calibration frame of a small high quality (like for the flat mirror above) spherical mirror instead of the lens L.

Instrument:

Optino : Focal ratio range: f/1 to f/500.

Output:

Along with the Zernike coefficients, wavefront and the optical quality, Sensoft gives diagnostics for correcting defocus, coma (by aligning the elements) and spherical aberration (by changing the separation between the elements). These corrections can be based on analytical formulae, or on a lookup table provided by the user for any optical element in the system.

How the test is done

1. Mount Optino on a suitable optical bench.
2. Under remote control from the PC, take the reference calibration frame, using the inbuilt light source.
3. Mount the optical element being tested in the configuration which is suitable for the test (lens, spherical mirror, flat mirror etc.)
4. Take the Shack-Hartmann image of the optical element.
5. Do the Analysis using Sensoft. The results are ready in about 10 seconds.
6. If required, take multiple SH frames for reducing noise.
7. Run Analysis. Sensoft automatically computes the average values.
8. Align the optical elements (if it's a multi-element system) using the indications given by Sensoft.
9. Find the correct focal plane using the indications given by Sensoft.
10. Correct support problems using the plots of the wavefront/mirror surface.

Requirements:

Instrument	Optino
Focal ratios covered	f/0.5 to f/500 standard.
Sampling on the pupil	25x25 spots standard. Up to 65x65 spots can be used.
Analysis Software	Sensoft Optino
CCD for SH	8-bit un-cooled or 16-bit cooled CCD.