Feature: Synthetic Fringe Image

General

The described feature is available for all µShape versions, especially recommended for Twyman-Green interferometers.

The µShape™ software package is a tool for measuring and analyzing of optical surfaces as well as the monochromatic aberration of optics in transmission. It was developed to be used with two ray interferometers primarily, but is also adaptable for other measurement devices which generate a data map that can be interpreted as phase map, like e.g. stylus devices.

Most common two ray interferometers used for topography measurements are from Fizeau or Twyman-Green type. While using a Fizeau interferometer the air gap between sample surface and Fizeau surface is measured directly, a Twyman-Green interferometer determines the optical path difference between a test and a reference arm. Both interferometer types produce fringe patterns that are detected by the interferometer camera, displayed in the live image window and used for the analysis. Certainly the observed fringe patterns differ slightly for both interferometer types, although both give the same results if correctly configured.

The advantage of a Fizeau interferometer is, that the detected fringes are quite similar to the fringe patterns you get using a test glass. Many opticians are still very familiar with these fringe images and know very well how to overwork the sample depending on the fringe pattern. In contrary a Twyman-Green interferometer is much more flexible. For different test setups only one reference flat is needed and the intensities of both interferometer arms can be adapted easily. This maximizes the contrast in the interference fringes which increases the resolution in depth.

To provide a system independent interferometric two ray fringe pattern, the µShape™ contains a special display feature called *Synthetic Fringes*.

Feature description

To create a synthetic fringe image just press the Synthetic fringe button in the view tool bar . µShape™ re-calculates an ideal synthetic fringe image (contrast equal 1) from the measured aberration. Below the fringe image the current display parameters are listed. You can modify them by right mouse click inside the Synthetic fringe window.

Additional tilt as well as the wavelength used for calculation can be specified. Narrow fringes accentuate the fringe extremes, i.e. the black and white fringes. Finally you can specify how the synthetic fringe image behaves when (left-) clicking the fringe image and moving the mouse. One option is to tilt the sample the other is to simulate test glass fringe behaviour when pressing the sample.

If you need more information don't hesitate to contact us at software@trioptics-berlin.com.