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Combined Twyman–Green and Mach–Zehnder interferometer for microlens testing

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Abstract

A new interferometer design for microlens testing is presented. The phase-shifting system combines the advantages of a Twyman–Green and a Mach–Zehnder interferometer and permits full characterization of the aberrations of microlenses as well as radius of curvature and focal length measurements. The Twyman–Green system is applied to surface testing in reflection (single reflection), whereas the Mach–Zehnder system is used for lens testing in transmission (single pass). Both measurements are performed without removal of the test part, allowing for combination of the results without confusion of the actual lens and without an azimuthal orientation error. The interferometer setup is explained, the test procedure is described, and experimental results are given.

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