

WAVEFRONT ABERRATION AND DISTANCE MEASUREMENT PHASE CAMERA

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ABSTRACT

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A system consisting of a phase camera with microlenses placed in the focal point of a converging lens, wherein the camera data, processed using a combined Fourier "Slice" and fast Fourier transform edge detection technique, provide both a three-dimensional wavefront map and a real scene depth map within a broad range of volumes.

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The invention is suitable for use in any field where wavefronts need to be known such as earth-based astronomical observation, ophthalmology, etc., as well as in fields requiring metrology, e.g. real scenes, CCD polishing, automobile mechanics, etc. The invention is applied to the particular case of atmospheric tomography using ELTs (large-diameter telescopes: 50 or 100 metres).

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Figure. 1