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Iterative improvement of lockin-thermography results by temporal and spatial adaption of optical excitation

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Abstract

Lockin-thermography is usually performed using modulated lamps. Unfortunately, their intensity distribution is inhomogeneous even on a flat specimen, thereby producing lateral heat flows within the inspected sample. These heat flows are unwanted effects that mask the images of the interesting defect structures, i.e. reduce lateral resolution.

The idea proposed in this paper is to use an LCD-projector as a heat source with its potential to assign each excitation pixel individually its oscillation amplitude, intensity offset, and phase lag. By an iterative self-learning process an illumination pattern is generated in such a way that lateral heat flow is eliminated and resolution enhanced.

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