

Holographic and electronic speckle pattern interferometry applied to the measurement of static and dynamic mechanical properties of elastomers

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Description: -

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Dynamic Holographic

In fringe projection the carrier already exists in the spatial domain. On the other hand, single-pixel detector-based interferometry has already been successfully applied for dynamic measurement.

A Combination of a 3 Step Temporal Phase Algorithm and a High Speed Interferometer System for Dynamic Profile Measurements

The fringe counting method gives the total displacement over the field of view imaged by the CCD camera and is subject to a fringe error of 0.

Dynamic Holographic

Generally, there are two types of techniques: one is based on two-dimensional sensor like CCD or CMOS camera and the other is based on single-pixel photodetector.

Electronic Speckle Pattern Interferometry

With a proper selection of the aperture size and a careful adjustment of the two fiber-end positions, it is possible to separate the spectra of two superimposed holograms in the frequency domain. An initial speckle pattern corresponding to the undeformed state of the object is taken as the reference, and subsequent speckle patterns are digitally subtracted/reconstructed from it to produce time-varying fringe patterns corresponding to the relative deformation of the test object. As long as the two speckle patterns stay correlated, it is possible to extract information about the object displacement as explained in Section 5.

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