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TECHNOLOGY FOR CONTACTLESS, REAL-TIME, DYNAMIC DISPLACEMENT MEASUREMENTS USING OPTICAL OR VIDEO METHODS

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Abstract

Measuring the movement or deformation of a structure usually requires physical contact between the structure's components and a measuring device or sensor. An emerging technology, called video structural monitoring, uses patterns within video recordings to measure dynamic displacements (1) without requiring contact, (2) over a range of resolutions, and (3) on a real-time (or post-processing) basis. The operator matches the video frame rate to the dynamic event and selects visible targets at points of interest on the structure surface to measure movements of (or deformation between) the targets. In the post-processing mode, new targets can be selected to supplement the real-time interpretation or to focus on other specific areas of the structure.

Key words: Instrumentation and monitoring, video structural monitoring, digital image correlation, DIC, optical imaging, deformation and displacement measurements, vibration measurements, mechanical integrity monitoring

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