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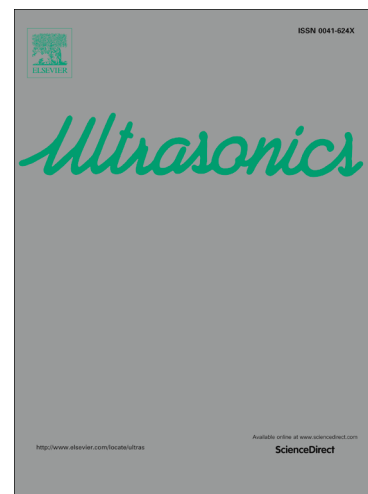
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Impact Damage Visualization in a Honeycomb Composite Panel through Laser Inspection using Zero-lag Cross-correlation Imaging

Condition

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Abstract

A fully non-contact laser-based nondestructive inspection (NDI) system is developed to detect and visualize damage in structures. The study focuses on the size quantification and characterization of a barely visible impact damage (BVID) in a honeycomb composite panel. The hardware consists of a Q-switched Nd:YAG pulse laser that probes the panel by generating broadband guided waves *via* thermo-elastic expansion. The laser, in combination with a set of galvano-mirrors is used to raster scan over a two-dimensional surface covering the damaged region of an impacted quasi-isotropic [60/0/-60]_s honeycomb composite panel. The out-of-plane velocities are measured at a fixed location normal to the surface by a laser Doppler vibrometer (LDV). An ultrasonic full wavefield assembled from the three-dimensional space-time data matrix in the interrogated area is first acquired and then processed for

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