

Guided Acoustic Wavefields for Damage Detection/Characterization and Novel Transducer Designs

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ABSTRACT

The application of wave-based inspection methods for the analysis of the state of health of structural components has received significant attention in recent years. The propagation and G UW, together with the application of Scanning Laser Vibrometry for full wavefield measurement enables the introduction of novel damage detection techniques which are based on the application of filtering techniques in the frequency/wavenumber space. Goal of these techniques is to separate the contribution of damage from the overall response of the structure, thus highlighting its presence and location.

This presentation will provide an overview of techniques developed for the analysis of guided wavefield, and their application for damage detection, structural characterization, and for the design of novel transducers for Structural Health Monitoring. These transducers feature patterns that enable wave steering through the selection of the excitation frequency, and the measurement of multiple strain components for surface acoustic wave-based sensing of strain.