



Guided Waves in Structures for SHM: The Time - domain Spectral Element Method

Wieslaw Ostachowicz, Pawel Kudela, Marek Krawczuk, Arkadiusz Zak

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Understanding and analysing the complex phenomena related to elastic wave propagation has been the subject of intense research for many years and has enabled application in numerous fields of technology, including structural health monitoring (SHM). In the course of the rapid advancement of diagnostic methods utilising elastic wave propagation, it has become clear that existing methods of elastic wave modeling and analysis are not always very useful; developing numerical methods aimed at modeling and analysing these phenomena has become a necessity. Furthermore, any methods developed need to be verified experimentally, which has become achievable with the advancement of measurement methods utilising laser vibrometry.

Guided Waves in Structures for SHM reports on the simulation, analysis and experimental investigation related propagation of elastic waves in isotropic or laminated structures. The full spectrum of theoretical and practical issues associated with propagation of elastic waves is presented and discussed in this one study.

Key features:

- Covers both numerical and experimental aspects of modeling, analysis and measurement of elastic wave propagation in structural elements formed from isotropic or composite materials
- Comprehensively discusses the application of the Spectral Finite Element Method for modelling and analysing elastic wave propagation in diverse structural elements
- Presents results of experimental measurements employing advanced laser technologies, validating the quality and correctness of the developed numerical models
- Accompanying website (www.wiley.com/go/ostachowicz) contains demonstration versions of commercial software developed by the authors for modelling and analyzing elastic wave propagation using the Spectral Finite Element Method

Guided Waves in Structures for SHM provides a state of the art resource for researchers and graduate students in structural health monitoring, signal processing and structural dynamics. This book should also provide a useful reference for practising engineers within structural health monitoring and non-destructive testing.

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