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Nota di contenuto	CONTENTS; PREFACE; CONTRIBUTORS; LAUDATIO FOR PROFESSOR YIH-HSING PAO ON THE OCCASION OF THE INTERNATIONAL SYMPOSIUM ON ENGINEERING MECHANICS 2010, ON THE OCCASION OF HIS 80TH BIRTHDAY (21/22 May 2010) ; List of Publications - Professor Y. -H. Pao; CHAPTER 1 LAMB WAVES IN PHONONIC BAND GAP STRUCTURES; 1. Introduction; 2. Formulation and Numerical Methods; 2.1. Plane Wave Expansion Method21,75,76; 2.2. Finite-Difference Time-Domain Method; 2.3. Finite Element Analysis; 3. Phononic Band Gaps, Waveguides, and Cavities; 3.1. Phononic Band Gaps of Lamb Waves; 3.2. Phononic Waveguides 3.3. Cavity4. Demonstrations of Band Gaps and Potential Applications; 4.1. Measurements of Band Gaps in a Stubbed PC Plate77; 4.2. Micro Phononic Cavity for Lamb Wave Resonator; 5. Conclusions; References; CHAPTER 2 ON GENERALIZATION OF THE PHASE RELATIONS IN THE METHOD OF REVERBERATION-RAY MATRIX; 1. Introduction; 2. System of First-Order Differential Equations and the Solution; 3. Dual

Coordinate System and Coordinate Transform; 4. Generalized Phase Relations; 5. Wave Propagation in Anisotropic Laminates; 6. Summary; Acknowledgments; References
CHAPTER 3 SURFACE-WAVE NONLINEARITY MEASURED WITH EMAT FOR FATIGUED STEELS1. Introduction; 2. Materials; 3. Resonance-EMAT for Nonlinear Acoustics; 3.1. Spectroscopy Measurement; 3.2. Second Power Law; 3.3. Background Nonlinearity by Magnetostrictive Effect; 4. Rotating Bending Fatigue; 4.1. Measurements; 4.2. Results; 5. Discussions; 5.1. First Nonlinearity Peak; 5.2. Second Nonlinearity Peak; 6. Conclusion; References; CHAPTER 4 ACOUSTOELASTIC LAMB WAVES AND IMPLICATIONS FOR STRUCTURAL HEALTH MONITORING; 1. Introduction; 2. Background; 3. Theory; 3.1. Acoustoelastic Bulk Waves 3.2. Acoustoelastic Lamb Waves4. Numerical Results; 4.1. Stress Dependence at a Fixed Propagation Angle; 4.2. Angle Dependence at a Fixed Stress; 5. Experimental Results; 5.1. Description of Measurements; 5.2. Signal Analysis and Results; 6. Simulations and Discussion; 7. Conclusion and Future Work; Acknowledgments; References; CHAPTER 5 SOURCE SYNTHESIS FOR INVERSE PROBLEMS IN WAVE PROPAGATION; 5.1. Introduction; 5.2. Theory; 5.3. Numerical Example; 5.4. Conclusion; Acknowledgments; References; CHAPTER 6 AN INTRODUCTION TO AN ADAPTIVE DATA ANALYSIS METHOD; 1. Introduction
2. The Hilbert-Huang Transform3. A Significant Product of HHT: The Determination of Trend; 4. Some Applications; a. The Chirp Data; b. Speech Signal Analysis; 5. Conclusion; Acknowledgements; References; CHAPTER 7 COMPUTATIONAL FLUID DYNAMICS BASED ON THE UNIFIED COORDINATES - AN EXPOSE; 1. CFD as Numerical Solution to Nonlinear Hyperbolic PDEs - An Overview of Major Developments; 2. The Role of Coordinates in CFD; 2.1. Theoretical Issues; 2.2. Computational Issues; 2.3. The "Optimal Coordinate System"; 3. The Unified Coordinate System; 4. One-Dimensional Flow; 5. Multi-Dimensional Flow
6. Lagrangian Case

Sommario/riassunto

The book reviews recent research activities in applied mechanics and applied mathematics such as the fields of solid & fluid constitutive modeling for coupled fields, applications of geophysical & environmental context in judicious numerical-computational implementations. The book aims to merge foundation aspects of continuum mechanics with modern technological applications, notably on reviewing recent advances in the treated subjects in an attractive presentation accessible to a wide readership of engineering and applied sciences.