1. Record Nr. UNISA996508666103316

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Titolo	Advanced Electromagnetic Theory [[electronic resource] /] / by Arnab Rai Choudhuri
Pubbl/distr/stampa	Singapore : , : Springer Nature Singapore : , : Imprint : Springer, , 2022
ISBN	9789811959448 9789811959431
Edizione	[1st ed. 2022.]
Descrizione fisica	1 online resource (310 pages)
Collana	Lecture Notes in Physics, , 1616-6361 ; ; 1009
Disciplina	530.141
Soggetti	Electrodynamics Gravitation Plasma (Ionized gases) Classical Electrodynamics Classical and Quantum Gravity Plasma Physics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	1. Introduction -- 2. Electrostatics -- 3. Magnetostatics -- 4. Electrodynamics and Electromagnetic Waves -- 5. Relativity and Electrodynamics -- 6. Em Fields Of Time-Varying Sources.
Sommario/riassunto	This textbook provides a comprehensive one-semester course on advanced electromagnetic theory written from the modern perspective covering all important topics that a professional physicist needs to know. Starting from Maxwell's equations, electrostatics and magnetostatics, this book goes on to discuss such topics as relativistic electrodynamics, emission of electromagnetic radiation and plasma physics. It contains solved examples and exercises for students to highlight the concepts in each chapter.

2. Record Nr. UNINA9910822391003321

Titolo	Guided waves in structures for SHM : the time-domain spectral element method / / [edited by] Wieslaw Ostachowicz ... [et al.]
Pubbl/distr/stampa	Chichester, West Sussex ; ; Hoboken, NJ, : Wiley, 2012
ISBN	9786613409799 9781119966746 1119966744 9781283409797 1283409798 9781119965855 1119965853 9781119965862 1119965861
Edizione	[2nd ed.]
Descrizione fisica	1 online resource (351 p.)
Classificazione	SCI041000
Altri autori (Persone)	OstachowiczW. M (Wiesaw M.)
Disciplina	531/.1133
Soggetti	Elastic analysis (Engineering) Elastic wave propagation - Mathematical models Composite materials - Analysis Finite element method
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Guided Waves in Structures for SHM; Contents; Preface; 1 Introduction to the Theory of Elastic Waves; 1.1 Elastic Waves; 1.1.1 Longitudinal Waves (Compressional/Pressure/Primary/P Waves); 1.1.2 Shear Waves (Transverse/Secondary/S Waves); 1.1.3 Rayleigh Waves; 1.1.4 Love Waves; 1.1.5 Lamb Waves; 1.2 Basic Definitions; 1.3 Bulk Waves in Three-Dimensional Media; 1.3.1 Isotropic Media; 1.3.2 Christoffel Equations for Anisotropic Media; 1.3.3 Potential Method; 1.4 Plane Waves; 1.4.1 Surface Waves; 1.4.2 Derivation of Lamb Wave Equations 1.4.3 Numerical Solution of Rayleigh-Lamb Frequency Equations1.4.4 Distribution of Displacements and Stresses for Various Frequencies of Lamb Waves; 1.4.5 Shear Horizontal Waves; 1.5 Wave Propagation in

One-Dimensional Bodies of Circular Cross-Section; 1.5.1 Equations of Motion; 1.5.2 Longitudinal Waves; 1.5.3 Solution of Pochhammer Frequency Equation; 1.5.4 Torsional Waves; 1.5.5 Flexural Waves; References; 2 Spectral Finite Element Method; 2.1 Shape Functions in the Spectral Finite Element Method; 2.1.1 Lobatto Polynomials; 2.1.2 Chebyshev Polynomials; 2.1.3 Laguerre Polynomials
2.2 Approximating Displacement, Strain and Stress Fields2.3 Equations of Motion of a Body Discretised Using Spectral Finite Elements; 2.4 Computing Characteristic Matrices of Spectral Finite Elements; 2.4.1 Lobatto Quadrature; 2.4.2 Gauss Quadrature; 2.4.3 Gauss-Laguerre Quadrature; 2.5 Solving Equations of Motion of a Body Discretised Using Spectral Finite Elements; 2.5.1 Forcing with an Harmonic Signal; 2.5.2 Forcing with a Periodic Signal; 2.5.3 Forcing with a Nonperiodic Signal; References; 3 Three-Dimensional Laser Vibrometry; 3.1 Review of Elastic Wave Generation Methods
3.1.1 Force Impulse Methods3.1.2 Ultrasonic Methods; 3.1.3 Methods Based on the Electromagnetic Effect; 3.1.4 Methods Based on the Piezoelectric Effect; 3.1.5 Methods Based on the Magnetostrictive Effect; 3.1.6 Photothermal Methods; 3.2 Review of Elastic Wave Registration Methods; 3.2.1 Optical Methods; 3.3 Laser Vibrometry; 3.4 Analysis of Methods of Elastic Wave Generation and Registration; 3.5 Exemplary Results of Research on Elastic Wave Propagation Using 3D Laser Scanning Vibrometry; References; 4 One-Dimensional Structural Elements; 4.1 Theories of Rods
4.2 Displacement Fields of Structural Rod Elements4.3 Theories of Beams; 4.4 Displacement Fields of Structural Beam Elements; 4.5 Dispersion Curves; 4.6 Certain Numerical Considerations; 4.6.1 Natural Frequencies; 4.6.2 Wave Propagation; 4.7 Examples of Numerical Calculations; 4.7.1 Propagation of Longitudinal Elastic Waves in a Cracked Rod; 4.7.2 Propagation of Flexural Elastic Waves in a Rod; 4.7.3 Propagation of Coupled Longitudinal and Flexural Elastic Waves in a Rod; References; 5 Two-Dimensional Structural Elements; 5.1 Theories of Membranes, Plates and Shells
5.2 Displacement Fields of Structural Membrane Elements

Sommario/riassunto

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 b