1. Record Nr. UNINA9910299765703321

Autore	Vázquez-Cendón M. Elena
Titolo	Solving Hyperbolic Equations with Finite Volume Methods / / by M. Elena Vázquez-Cendón
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2015
ISBN	3-319-14784-6
Edizione	[1st ed. 2015.]
Descrizione fisica	1 online resource (XVII, 188 p. 55 illus., 43 illus. in color.)
Collana	La Matematica per il 3+2, , 2038-5722 ; ; 90
Disciplina	532
Soggetti	Software engineering Applied mathematics Engineering mathematics Environmental sciences Computer science - Mathematics Physics Software Engineering Mathematical and Computational Engineering Math. Appl. in Environmental Science Computational Mathematics and Numerical Analysis Mathematical Methods in Physics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Bibliographic Level Mode of Issuance: Monograph
Nota di contenuto	1 Part I Basic concepts and examples of environmental and industrial interest -- 2 Motivation -- 3 Hyperbolic conservation laws. Basic concepts and examples -- 4 Types of solutions to hyperbolic systems of conservation laws -- 5 Biographical summary of Professor Peter Lax -- 6 Part II Finite volume methods applied to the hyperbolic conservation laws -- 7 1D hyperbolic linear systems -- 8 1D Non-linear hyperbolic systems -- 9 Biographical summary of Professor Sergei Konstantinovich Godunov -- 10 Part III MATLAB codes for the studied methods -- 11 Codes for the linear transport equation -- 12 Codes for the Burgers equation -- 13 Biographical summary of Professor Eleuterio Francisco Toro.

Sommario/riassunto	Finite volume methods are used in numerous applications and by a broad multidisciplinary scientific community. The book communicates this important tool to students, researchers in training and academics involved in the training of students in different science and technology fields. The selection of content is based on the author’s experience giving PhD and master courses in different universities. In the book the introduction of new concepts and numerical methods go together with simple exercises, examples and applications that contribute to reinforce them. In addition, some of them involve the execution of MATLAB codes. The author promotes an understanding of common terminology with a balance between mathematical rigor and physical intuition that characterizes the origin of the methods. This book aims to be a first contact with finite volume methods. Once readers have studied it, they will be able to follow more specific bibliographical references and use commercial programs or open source software within the framework of Computational Fluid Dynamics (CFD).

2.

Record Nr.	UNINA9910973129903321
Titolo	Nondestructive testing : methods, analyses and applications / / Earl N. Mallory, editor
Pubbl/distr/stampa	New York, : Nova Science Publishers, c2010
ISBN	1-61209-363-9
Edizione	[1st ed.]
Descrizione fisica	1 online resource (216 p.)
Collana	Mechanical engineering theory and applications
Altri autori (Persone)	MalloryEarl N
Disciplina	620.1/127
Soggetti	Nondestructive testing Nondestructive testing - Mathematical models
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	Intro -- NONDESTRUCTIVE TESTING: METHODS, ANALYSES AND APPLICATIONS -- NONDESTRUCTIVE TESTING: METHODS, ANALYSES AND APPLICATIONS -- CONTENTS -- PREFACE -- Chapter 1 NONDESTRUCTIVE MATERIALS CHARACTERIZATION BY MAGNETIC SENSING -- ABSTRACT -- 1. INTRODUCTION -- 2. MODELING OF THE

SIGNAL FROM ISOTROPIC SPHERICAL INCLUSIONS -- 2.1. Infinite Homogeneous Medium Containing a Spherical Inclusion -- 2.2. Numerical Results -- 2.3. Half-Space with a Surface-Breaking Spherical Inclusion -- 2.4. Half-Space with a Subsurface Spherical Inclusion -- 3. EXPERIMENTAL INVESTIGATION OF THE SIGNAL FROM ISOTROPIC SPHERICAL INCLUSIONS -- 3.1. Thermoelectric Detection of Surface-Breaking Spherical Tin Inclusions in Copper -- 3.1.1. Experimental method -- 3.1.2. Experimental results -- 3.2. Thermoelectric Detection of Subsurface Tin Inclusions In Copper -- 3.2.1. Experimental method -- 3.2.2. Experimental results -- 4. THERMOELECTRIC DETECTION OF HARD ALPHA INCLUSION IN TI-6AL-4V -- 4.1. State of Art -- 4.2. Experimental Method -- 4.3. Experimental Results -- 5. THERMOELECTRIC SIGNATURE PRODUCED BY RESIDUAL STRESS -- 5.1. State of Art -- 5.2. Monitoring Residual Stress Relaxation in Copper -- 5.2.1. Thermal stress release -- 5.2.2. Experimental results -- 5.3. Monitoring Residual Stress Relaxation in Nickel-Base Superalloys -- 6. CONCLUSION -- REFERENCES -- Chapter 2 EXPERIMENTAL AND NUMERICAL METHOD FOR NONDESTRUCTIVE ULTRASONIC DEFECT DETECTION -- ABSTRACT -- 1. INTRODUCTION -- 2. LASER-BASED ULTRASOUND -- 3. MODELING PROCEDURES -- 3.1. Explicit Dynamic Analysis for Wave Propagation -- 3.2. Propagation of Sound Waves through Air -- 4. RESULTS -- 4.1. Comparison with Analytical Solution - Circular Annulus -- 4.2. Testing of the Rail Head without Defects -- 4.3. Testing of the Rail Web -- 4.4. Testing of the Rail Head with Defect.
4.5. Testing of the Rail Head without Defects Using a Non-Contact Transducer -- 5. CONCLUSION -- REFERENCES -- Chapter 3 INVESTIGATION OF THERMAL PROPERTIES OF STEEL UNDERGOING HEAT TREATMENT BY THE PHOTOTHERMAL DEFLECTION TECHNIQUE: CORRELATION WITH MECHANICAL PROPERTIES -- ABSTRACT -- 1. INTRODUCTION -- 2. PRINCIPLE OF THE PTD TECHNIQUE -- 3. THEORY -- 3.1. Heat Transfer by Conduction Mode -- 3.2. Calculation of the Laser Probe Beam Deflection -- 3.3. Calculation of the Periodic Elevation Temperature T0 at the Sample Surface -- 3.3.1. Case of bulk sample -- 3.3.2. Sample composed of a layer deposed on a substrate -- 3.3.3. Case of n layers deposed on a substrate -- 3.4. Optimization of Experimental Conditions for Determining the Thermal Properties of the Graphite Layer and the Sample -- 3.4.1. Study of the thermal properties of the graphite layer -- 3.4.1.1. Case where the graphite layer is thermally thick: Determination of its thermal diffusivity -- 3.4.1.2. Case of thermally thin graphite layer: Determination of its thermal conductivity -- 3.4.2. Influence of the graphite layer thickness on the determination of thermal properties of the sample -- 3.4.2.1. Case of thermally thick graphite layer -- 3.4.2.2. Case of thermally thin graphite layer -- 4. EXPERIMENTAL SET-UP OF THE PTD TECHNIQUE -- 5. EXPERIMENTAL RESULTS -- 5.1. Comparison between Different Photothermal Deflection Technique to Determine Thermal Properties of Bulk Semiconductors -- 5.1.1. First method -- 5.1.2. Second method -- 5.1.3. Third Method -- CONCLUSION -- 5.2. Determination of Thermal Properties of Steel Undergoing Heat Treatments -- 5.2.1. Determination of thermal properties of the graphite layer -- 5.2.2. Determination of thermal properties of some metals -- 5.2.3. Study of treated steels -- A. DETERMINATION OF THE THERMAL AND MECHANICAL PROPERTIES OF CARBURIZED SAMPLES.
A.1. Preparation of the Sample -- A.2. Thermal Properties Investigation -- A.3. Mechanical Properties -- CONCLUSION -- B. DETERMINATION OF THE THERMAL AND MECHANICAL PROPERTIES OF NITRIDE SAMPLES -- B.1. Nitriding Process -- B.2. Correlation between Thermal and

Mechanical Properties -- CONCLUSION -- C. ELECTROEROSION -- C.1. Preparation of the Sample -- C.2. Prospecting of the Affected Depth by the PTD Technique -- C.3. Evolution of the Thermal Properties -- CONCLUSION -- D. CORRELATION BETWEEN THE THERMAL PROPERTIES AND THE HARDNESS OF END-QUENCH BARS FOR C48, 42CRMO4 AND 35NICRMO16 STEELS -- D.1. Heat Treatment and Preparation of the Sample -- D.2. Determination of the Thermal Properties -- D.3. Measurements of Rockwell Hardness (HRC) -- 6.4.4. Correlation between the thermal and the mechanical properties -- CONCLUSION -- REFERENCES -- Chapter 4 MACHINE THERMAL DIAGNOSTICS LATEST ADVANCES -- ABSTRACT -- 1. INTRODUCTION -- 2. THEORETICAL BACKGROUND -- 2.1. Diagnostic Parameter -- 2.2. Residual Service Life -- 3. EXPERIMENTAL AND FIT OF EXPERIMENTAL DATA -- 4. ON INFLUENCE OF CONDITIONS ON MACHINE HEATING -- 5. PREDICTED RSL RELIABILITY -- 5.1. Determination of RSL Reliabiliy by Simulation -- 5.2. Calculation Algorithm and Results of Simulations -- 6. CONCLUSION -- 6. ACKNOWLEDGMENTS -- REFERENCES -- NOMENCLATURE -- Chapter 5 SCANNING ACOUSTIC CORRELATION MICROSCOPY -- ABSTRACT -- INTRODUCTION -- Propagation Analysis -- Cross Correlation Analysis -- RESULTS -- CONCLUSION -- ACKNOWLEDGMENT -- REFERENCES -- INDEX.

Sommario/riassunto

Presents and reviews data on non-destructive testing discussing topics such as: a non-contacting thermoelectric method for non-destructive detection of material imperfections in metals by magnetic sensing; laser generated ultrasound as a tool for defect detection combined with air-coupled receivers; and, the photothermal deflection technique.