Ocean Acoustic Propagation By Finite Difference Methods S T Mcdaniel

The Finite Element Method in ElectromagneticsFinite Elements for Wave ElectromagneticsProgress in Underwater AcousticsShear Waves in Marine SedimentsFundamentals of Noise and VibrationTheoretical and Computational Acoustics 2005Applied Underwater AcousticsComputational Acoustics: Ocean-acoustic models and supercomputingOcean Acoustic Propagation by Finite Difference MethodsOcean ResourcesProceedings of the Third European Conference on Underwater AcousticsAcoustic Interactions with Submerged Elastic StructuresSIAM Journal on Numerical AnalysisComputational Methods for Fluid/structure InteractionAcoustic Interactions with Submerged Elastic StructuresUnderwater Acoustic Modeling2AN.Automatic Object RecognitionOceanography and AcousticsComputational Acoustics: Scattering, supercomputing, and propagationEffective Computational Methods for Wave PropagationComputational Acoustics: Acoustic propagationNumerical Ocean Acoustic Propagation in Three DimensionsComputational Ocean AcousticsShallow-water AcousticsRay and Wave Chaos in Ocean AcousticsModeling and Measurement Methods for Acoustic Waves and for Acoustic MicrodevicesSoviet PhysicsThe Journal of the Acoustical Society of AmericaEncyclopedia of Applied PhysicsOcean ReverberationComputational AcousticsAcoustic Signal Processing for

Ocean ExplorationVerhandelingen der Koninklijke Nederlandse Akademie van Wetenschappen, Afd. NatuurkundeModelling of Oceanic VorticesComputational Ocean AcousticsUnderwater Acoustic Modeling and SimulationTheoretical And Computational Acoustics 2001Government reports annual indexComputational Ocean Acoustics

The Finite Element Method in Electromagnetics

Finite Elements for Wave Electromagnetics

Ocean engineering is generally considered to be concerned with studies on the effects of the ocean on the land and with the design, construction and operation of vehicles, structures and systems for use in the ocean or marine environment. The practice of engineering differs from that of science in both motivations and objectives. Science seeks understanding of the principles of nature in terms of generalizations expressed as laws and classifications. Engineering seeks the application of knowledge of the physical and natural world to produce a benefit expressed as a device, system, material, and/or process. From the standpoint of the financial sponsors of an engineering project, the ideal approach is one of minimal risk in which only proven knowledge, materials and procedures are

employed. There is frequent departure from this ideal in anticipation of the increased benefit expected from a large increase in performance of a structure or device. The process of acquiring this new capability is engineering research. Historically, ocean engineering developed with the application of engineering principles and processes to the design of ships and, later, to the machinery that propels them. In most societies, naval architecture and marine engineering are recognised as the origin of ocean engineering. In fact, the design of a ship constitutes the original systems engineering programme involving hydrodynamics/fluid flow, structural design, machinery design, electrical engineering and so on as well as requiring knowledge of the ocean environment (waves, corrosion, etc.).

Progress in Underwater Acoustics

Shear Waves in Marine Sediments

Fundamentals of Noise and Vibration

Counter This cumulative index is essential for all those who need to consult the

Encyclopedia of Applied Physics for specific information which is not treated in a separate entry. It provides full access to this indispensible reference work.

Theoretical and Computational Acoustics 2005

Applied Underwater Acoustics

Computational Acoustics: Ocean-acoustic models and supercomputing

Fundamentals of Noise and Vibration is based on the first semester of the postgraduate Masters' course in Sound and Vibration Studies at the Institute of Sound and Vibration Research, at the University of Southampton. The main objective of the course is to provide students with the skills and knowledge required to practise in the field of noise and vibration control technology. Readers do not need prior formal training in acoustics although a basic understanding of mechanics, fluid dynamics and applied mathematics is required. Many of the chapters use examples of models and forms of analysis to illustrate the principles that they introduce. By pointing toward the practical application of these

fundamental principles and methods, the book will benefit those wishing to extend their knowledge and understanding of acoustic and vibration technology for professional purposes. Advanced Applications in Acoustucs, Noise and Vibration serves as a companion volume.

Ocean Acoustic Propagation by Finite Difference Methods

This series of volumes constitutes an outstanding collection of contributions by the most active research workers in the area of acoustics and mechanics. It brings the reader up to date on the status of the various aspects of research in this field. The volumes should preserve their value for a long time, as they represent a monument to the achievements of human research capabilities in the underwater-acoustics aspects of the environment.

Ocean Resources

IMAGE TRACKS AT HALIFAX by L.B. Felsen All living kind much effort spend Some model modes, some model rays, To cope with their environment Some feel that spectra all portrays. Some use their eyes, some use their nose Then there are those who with despatch, To sense where other things repose. Take refuge in the ocean wedge. For one group, nothing's more profound Than to explore the world

with sound. If things get messy, randomize. These audio diagnosticians What's partly smooth, determinize. You ponder, is it this or that? Go by the name of acousticians. And wish you were a lowly bat They regularly meet to check Whether their sonogram's on track. The meeting's hosts did treat us well. With images stored in their packs, They let the climate cast its spell. This year they came to Halifax. No weath'ry hope was placed in vain. There they combined with ocean types We were exposed to wind and rain, And each could hear the other's gripes. We glimpsed blue sky through clouds dispersed. A meeting naturally does start But rainy sequence was reversed: Reviewing present state of art. The ocean types would like it wet What we found out is where it's at: Yet they got stuck with sun instead. We cannot hope to match the bat Each confrence has the same refrain: Computer printouts by the reams It has been fun to meet again.

Proceedings of the Third European Conference on Underwater Acoustics

Acoustic Interactions with Submerged Elastic Structures

Applied Underwater Acoustics meets the needs of scientists and engineers working in underwater acoustics and graduate students solving problems in, and preparing

theses on, topics in underwater acoustics. The book is structured to provide the basis for rapidly assimilating the essential underwater acoustic knowledge base for practical application to daily research and analysis. Each chapter of the book is self-supporting and focuses on a single topic and its relation to underwater acoustics. The chapters start with a brief description of the topic's physical background, necessary definitions, and a short description of the applications, along with a roadmap to the chapter. The subtopics covered within individual subchapters include most frequently used equations that describe the topic. Equations are not derived, rather, assumptions behind equations and limitations on the applications of each equation are emphasized. Figures, tables, and illustrations related to the sub-topic are presented in an easy-to-use manner, and examples on the use of the equations, including appropriate figures and tables are also included. Provides a complete and up-to-date treatment of all major subjects of underwater acoustics Presents chapters written by recognized experts in their individual field Covers the fundamental knowledge scientists and engineers need to solve problems in underwater acoustics Illuminates, in shorter sub-chapters, the modern applications of underwater acoustics that are described in worked examples Demands no prior knowledge of underwater acoustics, and the physical principles and mathematics are designed to be readily understood by scientists, engineers, and graduate students of underwater acoustics Includes a comprehensive list of literature references for each chapter

SIAM Journal on Numerical Analysis

Part of a two-volume set comprising the proceedings of a symposium on computational acoustics, this volume focuses on acoustic and propagation. Coverage of the set ranges from time-domain computations to the search for solutions to global extrema and inverse problems.

Computational Methods for Fluid/structure Interaction

Underwater Acoustic Modeling and Simulation, Fourth Edition continues to provide the most authoritative overview of currently available propagation, noise, reverberation, and sonar-performance models. This fourth edition of a bestseller discusses the fundamental processes involved in simulating the performance of underwater acoustic systems and emphasizes the importance of applying the proper modeling resources to simulate the behavior of sound in virtual ocean environments. New to the Fourth Edition Extensive new material that addresses recent advances in inverse techniques and marine-mammal protection Problem sets in each chapter Updated and expanded inventories of available models Designed for readers with an understanding of underwater acoustics but who are unfamiliar with the various aspects of modeling, the book includes sufficient mathematical derivations to demonstrate model formulations and provides

guidelines for selecting and using the models. Examples of each type of model illustrate model formulations, model assumptions, and algorithm efficiency. Simulation case studies are also included to demonstrate practical applications. Providing a thorough source of information on modeling resources, this book examines the translation of our physical understanding of sound in the sea into mathematical models that simulate acoustic propagation, noise, and reverberation in the ocean. The text shows how these models are used to predict and diagnose the performance of complex sonar systems operating in the undersea environment.

Acoustic Interactions with Submerged Elastic Structures

Shear waves and closely related interface waves (Rayleigh, Stoneley and Scholte) play an important role in many areas of engineering, geophysics and underwater acoustics. In some cases interest is focused on large-amplitude waves of low frequency such as those associ ated with earthquakes and nuclear explosions; in other cases low amplitude waves, which have often travelled great distances through the sediment, are of interest. Both low and high frequency shear and interface waves are often used for seafloor probing and sediment characterization. As a result of the wide spectrum of different interests, different disciplines have developed lines of research and a literature particularly suited to their own problems. For example water-column acousticians view the seafloor sediment as

the lower boundary of their domain and are interested in shear and interface waves in the near bottom sediments mainly from the standpoint of how they influence absorption and reflection at this boundary. On the other hand, geophysicists seeking deep oil deposits are interested in the maximum penetration into the sediments and the tell-tale characteristics of the seismic waves that have encountered potential oil or gas bearing strata. In another area, geotechnical engineers use shear and interface waves to study soil properties necessary for the design and the siting of seafloor structures.

Underwater Acoustic Modeling

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Market: Ocean dynamicists and acousticians. "Useful to scientists or students interested in ocean dynamical modelling, acoustic propagation modelling, and particularly to those interested in the union of these fields (which is likely to be become increasingly important)." Revue de livre With complete chapters contributed by leading authorities, this work offers a comprehensive overview of current combined research in acoustics and oceanography. Following an introduction on ocean variability, acoustic propagation, and coupled models,

subsequent chapters present up-to-date coverage of the developing relationship between ocean science and ocean acoustics, including an extensive review of state-of-the-art three-dimensional models.

Automatic Object Recognition

This book introduces a comprehensive mathematical formulation of the three-dimensional ocean acoustic propagation problem by means of functional and operator splitting techniques in conjunction with rational function approximations. It presents various numerical solutions of the model equation such as finite difference, alternating direction and preconditioning. The detailed analysis of the concept of 3D, N x 2D and 2D problems is very useful not only mathematically and physically, but also computationally. The inclusion of a complete detailed listing of proven computer codes which have been in use by a number of universities and research organizations worldwide makes this book a valuable reference source. Advanced knowledge of numerical methods, applied mathematics and ocean acoustics is not required to understand this book. It is oriented toward graduate students and research scientists to use for research and application purposes.

Oceanography and Acoustics

Computational Acoustics: Scattering, supercomputing, and propagation

1. Ray and wave propagation. 1.1. Underwater sound channel. 1.2. Basic equations. 1.3. Geometrical optics approximations and optical-mechanical analogy. The Hamiltonian formalism. 1.4. Ray travel times. 1.5. Range-dependent environments. 1.6. Acoustic ocean tomography. 1.7. Experiments on long-range sound propagation. 1.8. Summary -- 2. Ray chaos. 2.1. Hamiltonian chaos. 2.2. Lyapunov instability. 2.3. Ray-medium resonance. 2.4. Overlapping of resonances. 2.5. Vertical resonance. 2.6. Manifestation of regular and chaotic ray motion in distributions of ray travel times. 2.7. Summary -- 3. Wave chaos. 3.1. The problem of wave chaos. 3.2. Normal modes. 3.3. Mode coupling under chaotic conditions. 3.4. Influence of fine-scale inhomogeneities on wave dynamics. 3.5. Summary -- 4. Chaotic phenomena in random environment. 4.1. Ray chaos in a random medium. 4.2. Travel times of chaotic rays. 4.3. Modal structure of the sound field in a waveguide with random inhomogeneities. 4.4. Wave beam in an ocean acoustic waveguide. 4.5. Arrival times of sound pulses in the presence of internal waves and a mesoscale inhomogeneity. 4.6. Summary -- 5. Glossary of some concepts and notations in Hamiltonian chaos theory

Effective Computational Methods for Wave Propagation

Computational Acoustics: Acoustic propagation

Numerical Ocean Acoustic Propagation in Three Dimensions

Computational Ocean Acoustics

A new edition of the leading textbook on the finite element method, incorporating major advancements and further applications in the field of electromagnetics The finite element method (FEM) is a powerful simulation technique used to solve boundary-value problems in a variety of engineering circumstances. It has been widely used for analysis of electromagnetic fields in antennas, radar scattering, RF and microwave engineering, high-speed/high-frequency circuits, wireless communication, electromagnetic compatibility, photonics, remote sensing, biomedical engineering, and space exploration. The Finite Element Method in Electromagnetics, Third Edition explains the method's processes and techniques in careful, meticulous prose and covers not only essential finite element method theory, but also its latest developments and applications—giving engineers a methodical way to quickly master this very powerful numerical technique for

solving practical, often complicated, electromagnetic problems. Featuring over thirty percent new material, the third edition of this essential and comprehensive text now includes: A wider range of applications, including antennas, phased arrays, electric machines, high-frequency circuits, and crystal photonics The finite element analysis of wave propagation, scattering, and radiation in periodic structures The time-domain finite element method for analysis of wideband antennas and transient electromagnetic phenomena Novel domain decomposition techniques for parallel computation and efficient simulation of large-scale problems, such as phased-array antennas and photonic crystals Along with a great many examples, The Finite Element Method in Electromagnetics is an ideal book for engineering students as well as for professionals in the field.

Shallow-water Acoustics

A concise guide to the theory and application of numerical methods for predicting ocean acoustic propagation, also providing an introduction to numerical methods, with an overview of those methods presently in use. An in-depth development of the implicit-finite-difference technique is presented together with bench-mark test examples included to demonstrate its application to realistic ocean environments. Other applications include atmospheric acoustics, plasma physics, quantum mechanics, optics and seismology.

Ray and Wave Chaos in Ocean Acoustics

Acoustic Signal Processing for Ocean Explortion has two major goals: (i) to present signal processing algorithms that take into account the models of acoustic propagation in the ocean and; (ii) to give a perspective of the broad set of techniques, problems, and applications arising in ocean exploration. The book discusses related issues and problems focused in model based acoustic signal processing methods. Besides addressing the problem of the propagation of acoustics in the ocean, it presents relevant acoustic signal processing methods like matched field processing, array processing, and localization and detection techniques. These more traditional contexts are herein enlarged to include imaging and mapping, and new signal representation models like time/frequency and wavelet transforms. Several applied aspects of these topics, such as the application of acoustics to fisheries, sea floor swath mapping by swath bathymetry and side scan sonar, autonomous underwater vehicles and communications in underwater are also considered.

Modeling and Measurement Methods for Acoustic Waves and for Acoustic Microdevices

Soviet Physics

Due to the increase in computational power and new discoveries in propagation phenomena for linear and nonlinear waves, the area of computational wave propagation has become more significant in recent years. Exploring the latest developments in the field, Effective Computational Methods for Wave Propagation presents several modern, valuable computational methods used to describe wave propagation phenomena in selected areas of physics and technology. Featuring contributions from internationally known experts, the book is divided into four parts. It begins with the simulation of nonlinear dispersive waves from nonlinear optics and the theory and numerical analysis of Boussinesq systems. The next section focuses on computational approaches, including a finite element method and parabolic equation techniques, for mathematical models of underwater sound propagation and scattering. The book then offers a comprehensive introduction to modern numerical methods for time-dependent elastic wave propagation. The final part supplies an overview of high-order, low diffusion numerical methods for complex, compressible flows of aerodynamics. Concentrating on physics and technology, this volume provides the necessary computational methods to effectively tackle the sources of problems that involve some type of wave motion.

The Journal of the Acoustical Society of America

Encyclopedia of Applied Physics

Ocean Reverberation

During the past decade there has been a renewed interest in active sonar systems at both low and medium frequencies. More recently this interest has been extended to very high frequencies in shallow water. Reverberation often limits the detection performance of these systems, and there is a need to understand the underlying mechanisms that cause the scattering. With more emphasis being given to reverberation phenomena in the Scientific Program of Work at the SACLANT Undersea Research Centre, it was considered an opportune time to host a meeting, bringing together scientists from NATO countries to foster cross-disciplinary dialogue and generate ideas for new research directions. Consequently the Ocean Reverberation Symposium was held 25-29 May 1992 in La Spezia, Italy. Over 60 presentations were made on a diverse selection of topics, of which ten papers will be published as a SACLANTCEN Conference Proceedings. The papers in this volume are grouped into 8 sections, usually in the same order as presented at the corresponding session of the Symposium: Section 1 - Scattering Mechanisms Section 2 - High Frequency Measurements and Mechanisms Section 3 -

Reverberation Modelling Section 4 - ARSRP Mid-Atlantic Ridge Experiment Section 5 - Low Frequency Measurements Section 6 - Volume Scattering Section 7 - Signal Processing Issues Section 8 - Applications Taken together the papers show some emerging trends in the research.

Computational Acoustics

"Many practical suggestions and tips; the examples are meaningful and the illustrations are effective.Destined to become a classic reference that any serious practitioner of ocean acoustics cannot afford to ignore." Revue de livre Authored by four internationally renowned scientists, this volume covers 20 years of progress in computational ocean acoustics and presents the latest numerical techniques used in solving the wave equation in heterogeneous fluid-solid media. The authors detail various computational schemes and illustrate many of the fundamental propagation features via 2-D color displays.

Acoustic Signal Processing for Ocean Exploration

Covers the theory and practice of innovative new approaches to modelling acoustic propagation There are as many types of acoustic phenomena as there are media, from longitudinal pressure waves in a fluid to S and P waves in seismology. This

text focuses on the application of computational methods to the fields of linear acoustics. Techniques for solving the linear wave equation in homogeneous medium are explored in depth, as are techniques for modelling wave propagation in inhomogeneous and anisotropic fluid medium from a source and scattering from objects. Written for both students and working engineers, this book features a unique pedagogical approach to acquainting readers with innovative numerical methods for developing computational procedures for solving problems in acoustics and for understanding linear acoustic propagation and scattering. Chapters follow a consistent format, beginning with a presentation of modelling paradigms, followed by descriptions of numerical methods appropriate to each paradigm. Along the way important implementation issues are discussed and examples are provided, as are exercises and references to suggested readings. Classic methods and approaches are explored throughout, along with comments on modern advances and novel modeling approaches. Bridges the gap between theory and implementation, and features examples illustrating the use of the methods described Provides complete derivations and explanations of recent research trends in order to provide readers with a deep understanding of novel techniques and methods Features a systematic presentation appropriate for advanced students as well as working professionals References, suggested reading and fully worked problems are provided throughout An indispensable learning tool/reference that readers will find useful throughout their academic and professional careers, this book is both a supplemental text for graduate students in

physics and engineering interested in acoustics and a valuable working resource for engineers in an array of industries, including defense, medicine, architecture, civil engineering, aerospace, biotech, and more.

Verhandelingen der Koninklijke Nederlandse Akademie van Wetenschappen, Afd. Natuurkunde

This book contains 67 papers presented at ICTCA2001. It includes three keynote addresses surveying the frontier developments in computational and theoretical acoustics. The papers cover aero-, seismo- and ocean acoustics, as well as ultrasonics. Computational methods, numerical simulation, theoretical analysis and experimental results are emphasized by different papers.The proceedings have been selected for coverage in:Index to Scientific & Technical Proceedings (ISTP CDROM version / ISI Proceedings)

Modelling of Oceanic Vortices

Acoustics is a mature field which enjoys a never ending youth. New developments are induced by either the search for a better understanding, or by technological innovations. Micro-fabrication techniques introduced a whole new class of microdevices, which exploit acoustic waves for various tasks, and in particular for

information processing and for sensing purposes. Performance improvements are achievable by better modelling tools, able to deal with more complex configurations, and by more refined techniques of fabrication and of integration in technological systems, like wireless communications. Several chapters of this book deal with modelling and fabrication techniques for microdevices, including unconventional phenomena and configurations. But this is far from exhausting the research lines in acoustics. Theoretical analyses and modelling techniques are presented, for phenomena ranging from the detection of cracks to the acoustics of the oceans. Measurement methods are also discussed, which probe by acoustic waves the properties of widely different systems.

Computational Ocean Acoustics

This is a collection of extended abstracts of contributions to an international meeting on coherent vortex structures. Specific topics discussed include: vortex interactions; topography; advection properties; and theoretical, numerical and laboratory experiments.

Underwater Acoustic Modeling and Simulation

Senior level/graduate level text/reference presenting state-of-the- art numerical

techniques to solve the wave equation in heterogeneous fluid-solid media. Numerical models have become standard research tools in acoustic laboratories, and thus computational acoustics is becoming an increasingly important branch of ocean acoustic science. The first edition of this successful book, written by the recognized leaders of the field, was the first to present a comprehensive and modern introduction to computational ocean acoustics accessible to students. This revision, with 100 additional pages, completely updates the material in the first edition and includes new models based on current research. It includes problems and solutions in every chapter, making the book more useful in teaching (the first edition had a separate solutions manual). The book is intended for graduate and advanced undergraduate students of acoustics, geology and geophysics, applied mathematics, ocean engineering or as a reference in computational methods courses, as well as professionals in these fields, particularly those working in government (especially Navy) and industry labs engaged in the development or use of propagating models.

Theoretical And Computational Acoustics 2001

Part of a two-volume set comprising the proceedings of a symposium on computational acoustics, this volume focuses on scattering, supercomputing and propagation. Coverage of the set ranges from time-domain computations to the search for solutions to global extrema and inverse problems.

Government reports annual index

Preface -- Reconstruction of sound pressure field by IFEM / R. Anderssohn [und weitere] -- Seabed parameter estimation by inversion of long range sound propagation fields / W. Chen, L. Ma and N.R. Chapman -- High resolution radon transform and wavefield separation / J. Chen [und weitere] -- Three-dimensional acoustic simulation on acoustic scattering by nonlinear internal wave in coastal ocean / L.Y.S. Chiu, C.-F. Chen and J.F. Lynch -- Estimation of shear wave velocity in seafloor sediment by seismo-acoustic interface waves: a case study for geotechnical application / H. Dong, J.M. Hovem and S.A. Frivik. The optimum source depth distribution for reverberation inversion in a shallow-water waveguide / T.F. Gao and E.C. Shang -- Semi-automatic adjoint PE modeling for geoacoustic inversion / J.-P. Hermand [und weitere] -- Modeling 3D wave propagation in the ocean coupled with elastic bottom and irregular interface / L.-W. Hsieh, D. Lee and C.-F. Chen -- Reflections from steel plates with doubly periodic anechoic coatings / S. Ivansson -- Seismic characterization and monitoring of thin-layer reservoir / L. Jin, X. Chen and J. Li -- The energy-conserving property of the standard PE / D. Lee and E.-C. Shang -- Estimation of anisotropic properties from a surface seismic survey and log data / R. Li and M. Urosevic -- Using Gaussian beam model in oceans with penetrating slope bottoms / Y.-T. Lin [und weitere] -- Application Niche genetic algorithms to AVOA inversion in orthorhombic media / M.-H. Lu and H.-Z. Yang -- Reconstruction of seismic impedance from marine seismic data / B.R.

Mabuza [und weitere] -- Characterization of an underwater acoustic signal using the statistics of the wavelet subband coefficients / M.I. Taroudakis, G. Tzagkarakis and P. Tsakalides -- Some theoretical aspects for elastic wave modeling in a recently developed spectral element method / X.M. Wang, G. Seriani and W.J. Lin -- Inversion of bottom back-scattering matrix / J.R. Wu, T.F. Gao and E.C. Shang -- New methods of scattering coefficients computation for the prediction of room acoustic parameters / X. Zeng, C.L. Christensen and J.H. Rindel

Computational Ocean Acoustics

The interaction of acoustic fields with submerged elastic structures, both by propagation and scattering, is being investigated at various institutions and laboratories world-wide with ever-increasing sophistication of experiments and analysis. This book offers a collection of contributions from these research centers that represent the present state-of-the-art in the study of acoustic elastic interaction, being on the cutting edge of these investigations. This includes the description of acoustic scattering from submerged elastic objects and shells by the Resonance Scattering Theory of Flax, Dragonette and berall, and the interaction of these phenomena in terms of interface waves. It also includes the use of this theory for the purpose of inverse scattering, i.e. the determination of the scattered objects properties from the received acoustic backscattered signals. The problem of acoustically excited waves in inhomogeneous and anisotropic materials, and of

inhomogeneous propagating waves is considered. Vibrations and resonances of elastic shells, including shells with various kinds of internal attachments, are analyzed. Acoustic scattering experiments are described in the time domain, and on the basis of the WignerOCoVille distribution. Acoustic propagation in the water column over elastic boundaries is studied experimentally both in laboratory tanks, and in the field, and is analyzed theoretically. Ultrasonic nondestructive testing, including such aspects like probe modelling, scattering by various types of cracks, receiving probes and calibration by a side-drilled hole is also studied in details. A comprehensive picture of these complex phenomena and other aspects is presented in the book by researchers that are experts in each of these domains, giving up-to-date accounts of the field in all these aspects. Contents: Discrete Spectral Analysis for Solitary Waves (J Engelbrecht et al.); Propagation and Interaction of Waves in Nonlinear-Elastic Solids with Microstructures (V I Erofeyev); Matched Field Processing: A Powerful Tool for the Study of Oceans and Scatterers (A Tolstoy); Progress in Underwater Acoustic Modeling (P C Etter); Reflectivity Response of a Submerged Layer with Density, Sound Velocity and Absorbtion Gradients (R Carb-Fit(r)); Mathematical Aspects of Wave Phenomena in a Wave Guide with Elastic Walls and Operator Polynomials (B P Belinskiy & J P Dauer); On Some General Mathematical Properties of the System Elastic Plate OCo Acoustic Medium (B P Belinskiy); Acoustic Scattering from Finite Length Cylinders Encapped by Two Hemispheres (D Decultot et al.); Acoustic Scattering from a Circular Cylindrical Shell Immersed in Water. Generation and Reradiation of Guided Waves

(F L(r)on & G Maze); The Finite Element/Boundary Element Approach to the Radiation and Scattering of Submerged Shells Including Internal Structure or Equipment (R Miller); Resonance Extraction, Phase Matching Method and the Surface Paths for Finite Elastic Cylinders (X-L Bao); Nonlinear Waves in Thermoelastic Solids Undergoing Phase Transitions (J K Knowles). Readership: Nonlinear scientists."