

1. Record Nr.	UNINA9910438032503321
Titolo	Inverse Problems and Large-Scale Computations [[electronic resource] /] / edited by Larisa Beilina, Yury V. Shestopalov
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2013
ISBN	3-319-00660-6
Edizione	[1st ed. 2013.]
Descrizione fisica	1 online resource (223 p.)
Collana	Springer Proceedings in Mathematics & Statistics, , 2194-1009 ; ; 52
Disciplina	515.357
Soggetti	Computer mathematics Mechanics Mechanics, Applied Mathematical analysis Analysis (Mathematics) Computational Science and Engineering Solid Mechanics Analysis
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	""Preface for Volume II: Inverse Problems and Large-Scale Computations""; ""Contents""; ""Adaptive Approximate Globally Convergent Algorithm with Backscattered Data""; ""1 Introduction""; ""2 The Forward and Inverse Problems""; ""2.1 The Nonlinear Integro-Differential Equation with Eliminated Unknown Coefficient""; ""3 A Sequence of Elliptic Dirichlet Boundary Value Problems""; ""4 A Finite Element Discretization""; ""5 Bounds for the Nonlinear Operator I? and A Priori Estimates""; ""5.1 The Dual Problem for a Linearized Approach""; ""6 A Posteriori Error Estimation"" ""7 The Adaptive Approximate Globally Convergent Algorithm"" ""7.1 An Approximate Globally Convergent Algorithm""; ""7.2 Adaptive Approximate Globally Convergent Algorithm""; ""8 Imaging of Land Mines Using an Adaptive Approximate Globally Convergent Algorithm""; ""8.1 Numerical Results""; ""8.2 Test 1""; ""8.3 Test 2""; ""References""; ""On the Formulation of Inverse Problem in Electrical Prospecting""; ""1

The First Inverse Problem"; "2 The Second Inverse Problem"; "3 The Third Inverse Problem"; "References"

"Approximate Globally Convergent Algorithm with Applications in Electrical Prospecting" "1 Introduction"; "2 The Maxwell Equations in Time Domain"; "3 Approximately Globally Convergent Method"; "3.1 Laplace Transformation of the Initial Boundary Value Problem"; "3.2 The Transformation Procedure"; "3.3 Modeling of the Tail Function  $V(x,s)$ "; "3.4 New Approximate Mathematical Model"; "3.5 The Algorithm"; "References"; "Preset Field Approximation and Self-consistent Analysis of the Scattering and Generation of Oscillations by a Layered Structure"; "1 Introduction"

"2 Technique" "3 Results"; "3.1 Example 1: Three-Layered Structure"; "3.2 Example 2: Single-Layered Structure with a Positive Value of the Cubic Susceptibility"; "4 Conclusion"; "References"; "A Posteriori Estimates for Errors of Functionalson Finite Volume Approximations to Solutions of Elliptic Boundary-Value Problems"; "1 Introduction"; "2 The Finite Volume Scheme"; "3 A Posteriori Error Estimates for Nonlinear Problems"; "4 Application to the Finite Volume Method"; "References"

"Electromagnetic Wave Propagation in Nonlinear Layered Waveguide Structures: Computational Approach to Determine Propagation Constants" "1 Introduction"; "2 TE Waves"; "2.1 Statement of the Problem"; "2.2 Differential Equations of the Problem"; "2.3 Transmission Conditions"; "2.4 Existence of Eigenvalues"; "2.5 Numerical Method"; "3 TM Waves"; "3.1 Statement of the Problem"; "3.2 Differential Equations of the Problem"; "3.3 Transmission Conditions"; "3.4 Existence of Eigenvalues"; "3.5 Numerical Method"; "4 Two-Layer Waveguide: TE Waves"; "5 Conclusion"

"References"

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Sommario/riassunto

This volume is a result of two international workshops, namely the Second Annual Workshop on Inverse Problems and the Workshop on Large-Scale Modeling, held jointly in Sunne, Sweden from May 1-6 2012. The subject of the inverse problems workshop was to present new analytical developments and new numerical methods for solutions of inverse problems. The objective of the large-scale modeling workshop was to identify large-scale problems arising in various fields of science and technology and covering all possible applications, with a particular focus on urgent problems in theoretical and applied electromagnetics. The workshops brought together scholars, professionals, mathematicians, and programmers and specialists working in large-scale modeling problems. The contributions in this volume are reflective of these themes and will be beneficial to researchers in this area.

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