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METHODS FOR SOLVING INVERSE PROBLEMS IN MATHEMATICAL PHYSICS

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Methods For Solving Inverse Problems In Mathematical Physics

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Methods For Solving Inverse Problems In Mathematical Physics:

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One-Dimensional Inverse Problems of Mathematical Physics Mikhail Mikhaĭlovich Lavrentʹev,K. G. Reznitskaya,Valeriĭ Georgievich ÎÂkhno,1986 A monograph that deals with the inverse problems of determining a variable coefficient and right side for hyperbolic and parabolic equations on the basis of known solutions at fixed points of space for all times Kernel Determination Problems in Hyperbolic Integro-Differential Equations Durdimurod K. Durdiev,Zhanna D. Totieva,2023-06-18 This book studies the construction methods for solving one dimensional and multidimensional inverse dynamical problems for hyperbolic equations with memory The theorems of uniqueness stability and existence of solutions of these inverse problems are obtained This book discusses the processes by using generalized solutions the spread of elastic or electromagnetic waves arising from sources of the type of pulsed directional impacts or explosions This book presents new results in the study of local and global solvability of kernel determination problems for a half space It describes the problems of reconstructing the coefficients of differential equations and the convolution kernel of hyperbolic integro differential equations by the method of Dirichlet to Neumann The book will be useful for researchers and students specializing in the field of inverse problems of mathematical physics **Mathematical and Numerical Approaches for Multi-Wave Inverse Problems** Larisa Beilina,Maïtine Bergounioux,Michel Cristofol,Anabela Da Silva,Amelie Litman,2020-06-30 This proceedings volume gathers peer reviewed selected papers presented at the Mathematical and Numerical Approaches for Multi Wave

Inverse Problems conference at the Centre Internacional de Rencontres Math matiques CIRM in Marseille France in April 2019 It brings the latest research into new reliable theoretical approaches and numerical techniques for solving nonlinear and inverse problems arising in multi wave and hybrid systems Multi wave inverse problems have a wide range of applications in acoustics electromagnetics optics medical imaging and geophysics to name but a few In turn it is well known that inverse problems are both nonlinear and ill posed two factors that pose major challenges for the development of new numerical methods for solving these problems which are discussed in detail These papers will be of interest to all researchers and graduate students working in the fields of nonlinear and inverse problems and its applications Operator Theory and Ill-Posed Problems Mikhail M. Lavrent'ev,Lev Ja. Savel'ev,2011-12-22 This book consists of three major parts The first two parts deal with general mathematical concepts and certain areas of operator theory The third part is devoted to ill posed problems It can be read independently of the first two parts and presents a good example of applying the methods of calculus and functional analysis The first part Basic Concepts briefly introduces the language of set theory and concepts of abstract linear and multilinear algebra Also introduced are the language of topology and fundamental concepts of calculus the limit the differential and the integral A special section is devoted to analysis on manifolds The second part Operators describes the most important function spaces and operator classes for both linear and nonlinear operators Different kinds of generalized functions and their transformations are considered Elements of the theory of linear operators are presented Spectral theory is given a special focus The third part Ill Posed Problems is devoted to problems of mathematical physics integral and operator equations evolution equations and problems of integral geometry It also deals with problems of analytic continuation Detailed coverage of the subjects and numerous examples and exercises make it possible to use the book as a textbook on some areas of calculus and functional analysis It can also be used as a reference textbook because of the extensive scope and detailed references with comments **Achievements and Challenges in the Field of Convolution Operators** Albrecht Böttcher,Oleksiy Karlovych,Eugene Shargorodsky,Ilya M. Spitkovsky,2025-03-13 This volume which is dedicated to Yuri Karlovich on the occasion of his 75th birthday includes biographical material personal reminiscences and carefully selected papers The contributions constituting the core of this volume are written by mathematicians who have collaborated with Yuri or have been influenced by his vast mathematical work They are devoted to topics of Yuri Karlovich s work for five decades starting with his work on singular integral operators with shift then broadened to include Toeplitz Wiener Hopf Fourier and Mellin convolution and pseudodifferential operators factorisation of almost periodic matrix functions and local trajectory methods for the study of algebras of convolution and singular integral operators

COMPUTATIONAL MODELS - Volume II Shaidurov Vladimir Viktorovich,2009-04-10 Computational Models is a component of Encyclopedia of Mathematical Sciences in the global Encyclopedia of Life Support Systems EOLSS which is an integrated compendium of twenty one Encyclopedias Modern Computational Mathematics arises in a wide variety of fields

including business economics engineering finance medicine and science The Theme on Computational Models provides the essential aspects of Computational Mathematics emphasizing Basic Methods for Solving Equations Numerical Analysis and Methods for Ordinary Differential Equations Numerical Methods and Algorithms Computational Methods and Algorithms Numerical Models and Simulation These two volumes are aimed at those seeking in depth of advanced knowledge University and College students Educators Professional practitioners Research personnel and Policy analysts managers and decision makers and NGOs Computational Methods for Applied Inverse Problems Yanfei Wang,Anatoly G. Yagola,Changchun Yang,2012-10-30 Nowadays inverse problems and applications in science and engineering represent an extremely active research field The subjects are related to mathematics physics geophysics geochemistry oceanography geography and remote sensing astronomy biomedicine and other areas of applications This monograph reports recent advances of inversion theory and recent developments with practical applications in frontiers of sciences especially inverse design and novel computational methods for inverse problems The practical applications include inverse scattering chemistry molecular spectra data processing quantitative remote sensing inversion seismic imaging oceanography and astronomical imaging The book serves as a reference book and readers who do research in applied mathematics engineering geophysics biomedicine image processing remote sensing and environmental science will benefit from the contents since the book incorporates a background of using statistical and non statistical methods e g regularization and optimization techniques for solving practical inverse problems

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