

1. Record Nr.	UNINA9910963244303321
Autore	Petrov Yu. P
Titolo	Well-posed, ill-posed, and intermediate problems with applications // Yu. P. Petrov and V.S. Sizikov
Pubbl/distr/stampa	Leiden ; Boston, : VSP, c2005
ISBN	9786610868728 9781280868726 1280868724 9781429427111 1429427116 9789047411949 9047411943 9783110195309 3110195305
Edizione	[1st ed.]
Descrizione fisica	1 online resource (244 p.)
Collana	Inverse and ill-posed problems series, , 1381-4524
Altri autori (Persone)	SizikovV. S (Valerii Sergeevich)
Disciplina	515.35 518/.6
Soggetti	Differential equations - Numerical solutions Numerical analysis - Improperly posed problems Engineering mathematics Mathematical physics
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	Front matter -- Preface -- Contents -- Part I. Three classes of problems in mathematics, physics, and engineering -- Chapter 1. Simplest ill-posed problems -- Chapter 2. Problems intermediate between well- and ill-posed problems -- Chapter 3. Change of sensitivity to measurement errors under integral transformations used in modeling of ships and marine control systems -- Bibliography to Part I -- Part II. Stable methods for solving inverse problems -- Chapter 4. Regular methods for solving ill-posed problems -- Chapter 5. Inverse problems in image reconstruction and tomography -- Bibliography to Part II -- Index

This book deals with one of the key problems in applied mathematics, namely the investigation into and providing for solution stability in solving equations with due allowance for inaccuracies in set initial data, parameters and coefficients of a mathematical model for an object under study, instrumental function, initial conditions, etc., and also with allowance for miscalculations, including roundoff errors. Until recently, all problems in mathematics, physics and engineering were divided into two classes: well-posed problems and ill-posed problems. The authors introduce a third class of problems: intermediate ones, which are problems that change their property of being well- or ill-posed on equivalent transformations of governing equations, and also problems that display the property of being either well- or ill-posed depending on the type of the functional space used. The book is divided into two parts: Part one deals with general properties of all three classes of mathematical, physical and engineering problems with approaches to solve them; Part two deals with several stable models for solving inverse ill-posed problems, illustrated with numerical examples.
