Título: An Introduction To Iterative Toeplitz Solvers

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Precio: Desconocido

Editorial:

Año: 2007

Tema:

Edición: 1ª

Sinopsis

ISBN: 9780898716368

Toeplitz systems arise in a variety of applications in mathematics, scientific computing, and engineering, including numerical partial and ordinary differential equations, numerical solutions of convolution-type integral equations, stationary autoregressive time series in statistics, minimal realization problems in control theory, system identification problems in signal processing, and image restoration problems in image processing.

This practical book introduces current developments in using iterative methods for solving Toeplitz systems based on the preconditioned conjugate gradient method. The authors focus on the important aspects of iterative Toeplitz solvers and give special attention to the construction of efficient circulant preconditioners. Applications of iterative Toeplitz solvers to practical problems are addressed, enabling readers to use the book?s methods and algorithms to solve their own problems.

An appendix containing the MATLAB® programs used to generate the numerical results is included.

Audience
Students and researchers in computational mathematics and scientific computing will benefit from this book.

Keywords
Iterative method, conjugate gradient method, Toeplitz system, circulant preconditioner, block-Toeplitz system

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Preface

Raymond Hon-Fu Chan is a Professor of Mathematics in the Department of Mathematics at the

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