

An introduction to iterative Toeplitz solvers

Can, Raymond Hon-Fu, 1958- , author

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Abstrak

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.