

Applications of Toeplitz Iterative Solvers in Science and Engineering

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ABSTRACT

In this talk, we give a brief survey of current developments and applications in using iterative methods for solving block Toeplitz systems. The block Toeplitz systems arise in a variety of applications in mathematics, scientific computing and engineering, for instance, image restoration problems in image processing; numerical differential equations and integral equations; time series analysis and control theory. Krylov subspace methods and multigrid methods are proposed. One of the main results of these iterative methods is that the cost of solving a large class of mn -by- mn block Toeplitz systems only requires $O(mn \log mn)$ operations.

Keywords: Block Toeplitz Matrix, Krylov Subspace Method, Multigrid Method, Image Restoration.

