

Preconditioner Updates for Solving Sequences of Linear Systems arising in inexact methods for optimization.

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The problem of solving sequences of linear systems is a key issue in inexact methods for large scale optimization problems. Recently, there has been a growing interest in improving the solution of the overall sequence by sharing some computational effort throughout the sequence. To this end, cheap updates of an existing preconditioner for one matrix of the sequence have been proposed in order to build preconditioners for subsequent matrices.

In this talk we address the problem of preconditioning two classes of indefinite systems: KKT systems arising in large-scale optimization methods for quadratic programming and possibly nonsymmetric systems arising from large nonlinear systems of equations. We present and analyse new strategies which are based on the availability of the factorization of a preconditioner for a reference matrix of the sequence and attempt to cheaply approximate the ideal update to such preconditioner. Numerical results showing the performance of these techniques are presented.