

Solution of structured algebraic linear systems in PDE-constrained optimization problems

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Symmetric and indefinite block structured matrices often arise after the discretization of a large variety of application problems, where the block form stems from the presence of more than one partial differential equation (PDE) in the problem, or from an optimization process with constraints, often also involving PDEs. Structure-aware preconditioning strategies have emerged as winning devices for efficiently and optimally solving the associated large linear systems. In this talk we review various forms of symmetric definite and indefinite preconditioners, with special emphasis on PDE-constrained optimization algebraic problems.