

Preconditioned solution of a magnetostatic optimal control problem

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We consider the preconditioned iterative solution for the optimal control of magnetostatic equations. The proposed method considers a proper regularization of the saddle-point forward system, featuring a positive-definite structure and preserving the divergence-free condition for the state. On the basis of the resulting optimality system, we develop a specific preconditioner with upper and lower bounds for the eigenvalues with mild dependence on the regularization parameter and the mesh size. This property guarantees the desired robustness of the proposed preconditioner in the limit case, which is as well confirmed by our numerical tests.

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