

Department of Mathematics

University of Houston

Scientific Computing Seminar

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Preconditioners for time-harmonic optimal control eddy current problems

Thursday, March 23, 2017

1:30 PM- 2:30 PM

Room 646 PGH

Abstract:

Time-harmonic formulations enable solution of time-dependent PDEs without use of normally slow and costly time-stepping methods. Two efficient preconditioners for the discretized parabolic and eddy current electromagnetic optimal control problems, one on block diagonal form and one utilizing the two by two block structure of the resulting matrix, are presented with simplified analysis and some numerical illustrations. Both methods result in tight eigenvalue bounds for the preconditioned matrix and very few, typically one digit number of iterations. The bounds for the block diagonal preconditioned method hold uniformly with respect to mesh and method parameters but not with respect to the problem parameter, the reluctivity and not for problems with control and observation regions restricted to a subset of the given domain. The bounds for the other preconditioning method holds uniformly with respect to all six parameters, mesh size, control cost and state equation regularization, conductivity and reluctivity and size of the subdomain.

This seminar is easily accessible to persons with disabilities. For more information or for assistance, please contact the Mathematics Department at 743-3500.