UNIVERSITY of HOUSTON

Department of Mathematics

Scientific Computing Seminar

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A preconditioner for the grad-div stabilized equal-order finite elements discretizations of the Oseen problem

Thursday, May 2, 2024
1 PM- 2 PM
Room 646   PGH

Abstract: We consider grad-div stabilized equal-order finite elements (FE) methods for the linearized Navier-Stokes equations. We propose block triangular preconditioners for the resulting system of algebraic equations which is closely related to the Augmented Lagrangian (AL) preconditioner. A field-of-values analysis of a preconditioned Krylov subspace method shows convergence bounds that are independent of the mesh parameter variation. Numerical studies support the theory and demonstrate the robustness of the approach also with respect to the viscosity parameter variation, typical for AL preconditioners when applied to inf-sup stable FE pairs. The numerical experiments also address the accuracy of grad-div stabilized equal-order FE method for the steady state Navier-Stokes equations. This is a joint work with Maxim Olshanskii.

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