Applied Mathematics Seminar

APPROXIMATE MURPHY–GOLUB–WATHEN PRECONDITIONING FOR SADDLE POINT PROBLEMS

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Abstract:

Murphy, Golub, and Wathen proposed a preconditioner for saddle-point systems that yields a diagonalizable coefficient matrix having three distinct eigenvalues, giving exact convergence of GMRES in three iterations. However, this preconditioner involves the inverse of a large submatrix. Practical computations only approximate this inverse, so GMRES will generally require more iterations. How many more? Recent results on the stability of GMRES lead to rigorous bounds on the number of required iterations as a function of the accuracy to which the preconditioner is applied, along with spectral properties of the constituent matrices. Numerical computations verify these results for problems from optimization and fluid dynamics.

Date: Wednesday, October, 21, 2015 Time: 3:00-4:00PM

Place: MAGC 1.318

Coffee will be served. For further information or for special accommodations, please contact Dr. Ranadhir Roy at 665-2371 or via email at rroy@utpa.edu