TEMPLE UNIVERSITY
Department of Mathematics

Applied Mathematics and Scientific Computing Seminar

Room 617 Wachman Hall

Wednesday, 17 November 2010, 4:00 p.m.

The stability of GMRES convergence with application to preconditioning by approximate deflation

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Abstract. How does GMRES convergence change when the coefficient matrix is perturbed? Through resolvent estimates we develop simple, general bounds to quantify the lag in convergence such a perturbation can induce. This analysis is particularly relevant for preconditioned systems, where an ideal preconditioner is only approximately applied in practical computations. To illustrate the utility of this theory, we combine our analysis with Stewart's invariant subspace perturbation theory to develop rigorous bounds on the performance of approximate deflation preconditioning using Ritz vectors.