Tim Chartier

Adaptive Algebraic Smoothers

Department of Mathematics
Davidson College
P O Box 6908
Davidson
NC 28035-6908
tichartier@davidson.edu
Bobby Philip

This talk will present a new method of adaptively constructing smoothers based on Local Sensitivity Analysis (LSA). Given a linear system, $Ax = b$, LSA identifies blocks of the matrix, A, so that a smoother, such as block iterative Gauss-Seidel, can be constructed based on the identified blocks. Results will be presented for constant and variable coefficient elliptic problems, systems arising from scalar and coupled system PDEs, as well as linear systems not arising from PDEs. The simplicity of the method will allow it to be easily incorporated into existing multigrid codes while providing a powerful tool for adaptively constructing smoothers tuned to the problem.