Scientific Computing Seminars

Speaker: H. Li

Affiliation: Wayne State University

Talk Title: Numerical Techniques for Axisymmetric Problems

Invited by: Johnny Guzmán

Time: Oct. 14 2011 11 a.m.

Location: 182 George Street, room 110

Abstract:

We discuss finite element and multigrid techniques solving the axisymmetric Poisson’s equation and the azimuthal Stokes problem on polygonal domains with possible singular solutions. In particular, we construct stable interpolation operators and establish the well-posedness and regularity in some weighted Sobolev space, which in turn, leads to special finite element spaces to approximate the solutions in the optimal rate. With a careful formulation, we obtain uniform convergence of the MG methods. These estimates can also be used to show the stability of the Taylor-Hood elements for the axisymmetric Stokes problem and to precondition the indefinite system from the axisymmetric Stokes equations.