Department of Mathematics

University of Houston

Scientific Computing Seminar

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Recent progresses on nonconforming finite element methods for the biharmonic equation and Stokes equations

Thursday, March 27, 2014
1:30 PM- 2:30 PM
Room 646 PGH

Abstract:

We will begin by a short review on the recent development in nonconforming finite elements on rectangular/quadrilateral/hexahedral domains.

A nonconforming quadrilateral element for the biharmonic problem will be introduced, which generalizes the incomplete biquadratic element on rectangles, also the well-known Morley nonconforming element on triangular triangulations. The fourth-order biharmonic equation occurs in the modeling creeping flows and deflection of thin plates. A piecewise linear quadrilateral element is applied to approximate the velocity field of Stokes equations with the piecewise constant element to approximate pressure field. We examine the discrete inf-sup condition for these elements. Finally, we introduce a stable cheapest finite element pair for solving the Stokes equations.