Applied Mathematics

McGill Applied Mathematics Seminar Series

November 18, 2002

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Title: "Anisotropic a posteriori error estimations in convection-diffusion with dominant convection"

Monday November 18, 2002 **Time: 2:35 pm** **Room: Burnside 1205**

Coffee and refreshments will be served after the seminar

Abstract: In this talk, we consider a convection-diffusion problem with dominant convection. We analyze an a posteriori residual error estimator for stabilized finite elements formulations. For anisotropic triangular and tetrahedral meshes, we derive lower and upper error bounds for the exact error with respect to the energy norm. The quotient of the lower and upper error bounds is proportional to the matching function which depends on the anisotropy of the problem and is independent of the small perturbation parameter ε. The quality of the estimator depends on how well the anisotropic mesh resolves the anisotropy of the problem. The estimator is more efficient when the matching function becames very small. Numerical results are given to confirm the anisotropic error analysis.

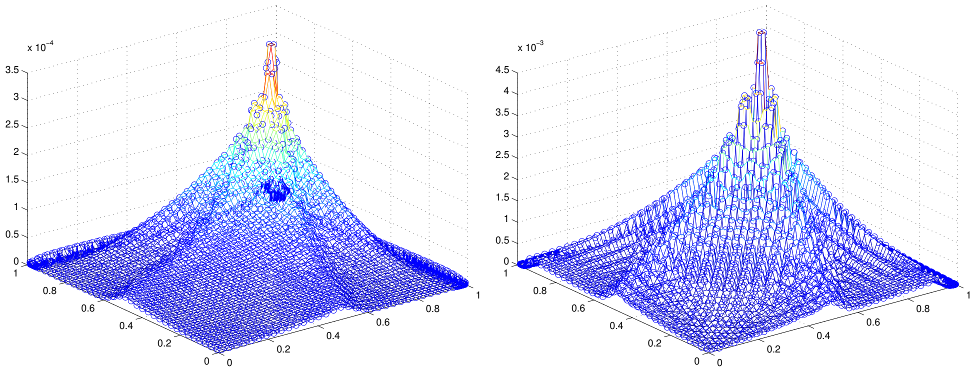

Figure 1: Left The energy norm of the exact error. Right: The local estimator