A Constructive a Priori Error Estimation for Finite Element Discretizations in a Non-convex Domain Using Mesh Refinement

Kenta Kobayashi
Department of Mathematics, Kanazawa University, Japan
kenta.k@staff.kanazawa-u.ac.jp

In solving elliptic boundary value problem by finite element method in a bounded domain which has a re-entrant corner, the convergent rate could be improved by using mesh refinement. In our research, we have obtained explicit H_0^1 and L^2 a priori error estimation for finite element solution of the Poisson equation in a polygonal domain. Our result is important in a theoretical sense as well as practical calculations because the constructive a priori error estimation for linear problem are often used for computer-assisted proof for non-linear problems.