

Superconvergent graded meshes for Dirichlet control problems

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ABSTRACT

Superconvergent discretization error estimates can be obtained when the solution is smooth enough and the finite element meshes enjoy some structural properties. The simplest one is that any two adjacent triangles form a parallelogram.

The solution of elliptic boundary value problems contains singularities in the vicinity of corners (and edges in 3D) leading to reduced convergence order in the case of quasi-uniform meshes. A remedy is the use of graded meshes near these corners.

The talk summarizes our results about a combination of both approaches and the application to Dirichlet control problems in polygonal domains.