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Embedding and a-priori adaptivity

A domain embedding technique for the solution of Dirichlet boundary value problems over general domains in arbitrary space dimensions is proposed. The main advantage of the method lies in the use of Cartesian meshes independent of the underlying domain. Error estimates are given which are optimal in the interior of the domain but deteriorate near the boundary. We overcome this dilemma by a finer discretization of the boundary using suitable wavelet subspaces. Finally improved error estimates and numerical experiments validate the method.

Reference: A. Rieder, A domain embedding method for Dirichlet problems in arbitrary space dimension, *M^2AN Modélisation mathématique et Analyse numérique* **32** (1998), to appear.