

Boundary concentrated finite elements for optimal boundary control problems of elliptic PDEs

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We investigate the discretization of optimal boundary control problems for elliptic equations by the boundary concentrated finite element method. We prove that the discretization error $\|u^* - u_h^*\|_{L^2(\Gamma)}$ decreases like N^{-1} , where N is the total number of unknowns. This makes the proposed method favorable in comparison to the h -version of the finite element method, where the discretization error behaves like $N^{-3/4}$. Moreover, we present an algorithm that solves the discretized problem in almost optimal complexity. The talk is complemented with numerical results. This is a joint work with Clemens Pechstein (JKU Linz) and Daniel Wachsmuth (RICAM, Linz).

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