

# Discretization Error Estimates for Dirichlet Control Problems in Polygonal Domains

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In this talk we discuss convergence results for finite element discretized Dirichlet control problems in polygonal domains. We investigate unconstrained as well as control constrained problems. In both cases we discretize the state and the control by piecewise linear and continuous functions. The error estimates mainly depend on the size of the interior angles but also on the presence of control constraints and the structure of the underlying mesh. For instance, considering non-convex domains, the convergence rates of the discrete optimal controls in the unconstrained case can even be worse than in the control constrained case.

References:

- [1] Th. Apel, M. Mateos, J. Pfefferer, and A. Rösch: On the regularity of the solutions of Dirichlet optimal control problems in polygonal domains. *SIAM J. Control Optim.* 53(2015), 3620–3641. <http://dx.doi.org/10.1137/140994186>.
- [2] Th. Apel, M. Mateos, J. Pfefferer, and A. Rösch: Error estimates for Dirichlet control problems in polygonal domains. In preparation.

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