Finite element error estimates for Neumann boundary control problems on graded meshes

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In this talk we will discuss a priori error estimates for a specific elliptic linear-quadratic optimal control problem in 2D with Neumann boundary control and inequality constraints on the control variable. The domain is assumed to be polygonal and maybe non-convex. The approximations of the optimal solution are constructed in a postprocessing step by a projection of the discrete adjoint state. Although the quality of these approximations is in general affected by the appearance of corner singularities, we will show that the order of convergence can be improved provided the mesh is sufficiently graded. The quality of the approximations of the optimal control problem is demonstrated by numerical examples.

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