

# Optimal control and regularization of a simplified Signorini problem

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In the context of optimal control we consider a simplified Signorini problem, an elliptic variational inequality of first kind with unilateral constraints on the boundary. The state is discretized using linear finite elements while a variational discretization is applied to the control. We derive a priori error estimates for control and state based on strong stationarity and a quadratic growth condition. The convergence rates depend on  $H^1$  and  $L^2$  error estimates of the simplified Signorini problem.

We verify the theoretical findings with numerical tests, which are done by considering a regularized problem. The corresponding regularization error is also discussed.

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