

# On regularization error estimates of elliptic optimal control problems with pure pointwise state constraints

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## Abstract

We focus on optimal control problems governed by elliptic partial differential equations. The state constraints are given in the interior. To avoid numerical and analytical difficulties, concerned the presence of the pure state constraints, we applied the Lavrentiev regularization. The key issue is addressed to the analytical and numerical investigation of the convergence order for the control. However, we do not require any pointwise boundedness of the control variable. We use the fact that the uniform bound for the control is essentially established by the objective. The proving technique is based on the source conditions, known in the theory of inverse problems, and on the other hand we use standard Slater point argument. Numerical experiments are presented.