

# An iterative Bregman regularization method for optimal control problems with inequality constraints

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In the first part of the talk we give a short introduction to the topic of optimal control of partial differential equations. We present some examples and introduce some key elements of optimal control problems governed by elliptic partial differential equations like, e.g. weak solutions of partial differential equations and the adjoint state. In particular we will discuss these concepts in the context of the Laplace equation.

In the second part of the talk we will motivate and introduce our method for solving such optimal control problems. We will first introduce well-known concepts, e.g. the Tikhonov regularization and the Proximal-Point-Method and discuss their advantages and disadvantages. This discussion will lead to our method, which is based on Bregman distances. It can be seen as a generalization of the Proximal-Point-Method. Under a suitable regularity assumption on the optimal solution we establish convergence rates for the control, state and adjoint state. Numerical examples are provided which support the efficiency and stability of our method.