Explicit algorithms to solve a class of state constrained parabolic optimal control problems

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Abstract

© 2015 by Walter de Gruyter Berlin/Boston. We consider an optimal control problem of a system governed by a linear parabolic equation with the following features: control is distributed, observation is either distributed or final, there are constraints on the state function and on its time derivative. Iterative solution methods are proposed and investigated for the finite difference approximations of these optimal control problems. Due to explicit in time approximation of the state equation and the appropriate choice of the preconditioners in the iterative methods, the implementation of all constructed methods is carried out by explicit formulae. Computational experiments confirm the theoretical results.

Keywords

constrained saddle point problem, finite difference method, iterative method, Optimal control