Lobachevskii Journal of Mathematics 2016 vol.37 N5, pages 561-569

Preconditioned Uzawa-type method for a state constrained parabolic optimal control problem with boundary control

Lapin A., Laitinen E.

Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

© 2016, Pleiades Publishing, Ltd.Iterative solution method for mesh approximation of an optimal control problem of a system governed by a linear parabolic equation is constructed and investigated. Control functions of the problem are in the right-hand side of the equation and in Neumann boundary condition, observation is in a part of the domain. Constraints on the control functions, state function and its time derivative are imposed. A mesh saddle point problem is constructed and preconditioned Uzawa-type method is applied to its solution. The main advantage of the iterative method is its effective implementation: every iteration step consists of the pointwise projections onto the segments and solving the linear mesh parabolic equations.

http://dx.doi.org/10.1134/S1995080216050085

Keywords

iterative method, mesh approximation, Parabolic optimal control problem, saddle point problem, state constraints