Numerical Algorithms for Solving Optimal Control Problems with Integro-Differential Equations of the Second Kind as Constraints

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Abstract

This study presents numerical algorithms for solving optimal control problems with a class of integro-differential equations of the second kind as costraints. This class of equations consists of an integro-differential term containing an Abel-type kernel. The first kind equations, with a weakly singular kernel, investigated here appear in the mathematical model of an aeroelasticity problem [1]. Two controls are considered in this study: delay and stochastic. The feasibility of the proposed numerical algorithm is demonstrated with examples in which the costs are compared with deterministic optimal controls without time lag.

Keyword：numerical algorithms、optimal control、 integro-differential equations of the second kind