

Optimal control problem for infinite order parabolic lag system

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Abstract

In this paper, we study the linear quadratic optimal control problem for $n \times n$ coupled system of infinite order parabolic partial differential equation, in which time-varying lags appear in the state equation and in the Neumann boundary condition simultaneously.

By Lions scheme, necessary and sufficient condition of optimality for the Neumann problem with quadratic functional and constraint control is derived. Finally, special cases for derived optimality conditions are presented.

Keywords : Parabolic lag system, mixed Neumann condition, operator of infinite order, optimality condition.

1. Introduction

The linear quadratic optimal control problem described by distributed parameter system have a variety of mechanical and technical sources and applications. Fundamental class of optimal controls and its mathematical approaches can be found in Lions [12].

The necessary and sufficient condition of optimality for systems ($n \times n$ systems) governed by different type of partial differential operators defined on spaces of functions of infinitely many variables are discuss in

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