

LIPSCHITZ SOLUTIONS OF OPTIMAL CONTROL PROBLEMS WITH STATE CONSTRAINTS OF ARBITRARY ORDER*

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Abstract

In this paper we generalize to an arbitrary order, under minimal hypotheses, some sufficient conditions for Lipschitz continuity of the optimal control. The proof combines the approach by Hager in 1979 for dealing with first-order state constraints, and the high-order alternative formulation of the optimality conditions. It takes into account the restrictive sign conditions taken into account in some recent papers.

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1 Introduction

In this paper we discuss optimal control problems with running state constraints. They are recognized as an important and difficult class of optimal control problems. They were discussed already at the very beginning of the theory (Pontryagin et al. [17]). Alternative optimality systems, motivated by reformulations in which the control enters in (a derivative of) the state

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