



Approximate Controllability of Non-densely Defined Semilinear Control System with Non Local Conditions

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Abstract: The present paper is devoted to the study of approximate controllability of nondensely defined semilinear control system with nonlocal conditions. The approximate controllability is obtained with nonlinearity satisfying the monotone condition and integral contractor condition. Finally, an example is provided to illustrate the application of the obtained results.

Keywords: *approximate controllability; semilinear systems; nondense domain; non-local conditions.*

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1 Introduction

Controllability concepts play a vital role in deterministic control theory. It is well known that controllability of deterministic equation is widely used in many fields of science and technology. Kalman [16] introduced the concept of controllability for finite dimensional deterministic linear control systems. Then Barnett [3] and Curtain [5] introduced the concepts of deterministic control theory in finite and infinite dimensional spaces. Balachandran [2] and Dauer et al. [7] studied the controllability of nonlinear systems in infinite dimensional spaces. The controllability of linear and nonlinear systems in infinite dimensional spaces has been extensively studied by many authors, when the operator A is densely defined, see [2, 7, 15, 19, 21, 23, 26]. On the other hand, we sometimes need to deal with non-densely defined operator. It is a very important case, which occurs in many practical situations. For example, the space C^1 with null values on the boundaries is not dense in the space of continuous functions, see [6]. For more examples and

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