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IMPULSIVE EVOLUTION EQUATIONS IN INFINITE DIMENSIONAL SPACES

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Abstract. In this paper we present a brief summary of recent work on the subject of Impulsive Evolution Equations on infinite dimensional Banach spaces and their optimal control. Both classical and more recent mathematical models of impulsive systems are discussed. Vector measures are used as admissible controls thereby absorbing impulsive controls. Existence of optimal controls and necessary conditions of optimality are presented.

Keywords. Vector measures, Feedback Controls, Impulsive Systems, Banach Spaces.
AMS (MOS) subject classification: 34G20, 34K30, 35A05, 35B30, 93C25.

1 Introduction

In this section we present a brief summary of recent development in the area of finite and infinite dimensional impulsive systems with some simple examples. The subject has drawn more attention of many workers in the field since the appearance of the book by Lakshmikantham,Bainov and Simenov [16]. There is substantial literature on the subject for finite and infinite dimensional systems dealing with the questions of existence of solutions and regularity properties, stability and more recently, control [2-10,12, 14-19] See also the references in [1]. Questions of stability are treated in [15-19]. Existence questions are treated in [2-6, 8,9,12,20]. Optimal controls are studied in [2-9]. The most popular model consists of a pair of evolution equations one governing the continuous flow and the other governing the evolution of jumps at a prespecified set of instants. By introducing signed measures and, in general, vector measures the classical models have been significantly improved [2-9]. In any case the subject is very interesting and is likely to draw attention of many young scientists with the prospect of extensive development in the future. Here in this paper we present briefly some recent work of the author in the field. In section 2, general models for impulsive systems and existence of solutions are discussed. In section 3 we consider control problems and discuss existence of optimal controls. In section 4 we present some remarks on basic assumptions and some open questions. In section 5, we consider