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APPROXIMATE AND EULER SOLUTIONS FOR SET DIFFERENTIAL EQUATION INVOLVING CAUSAL OPERATORS WITH MEMORY

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Abstract. In this paper, results pertaining to approximate solutions and Euler solutions for set differential equations involving causal operators with memory have been obtained.

Keywords. Set differential equation, Causal operator, Causal operator with memory, ϵ - approximate solutions, Euler solution.

AMS (MOS) subject classification: This is optional. But please supply them whenever possible.

1 Introduction

A causal operator [1,2] is a nonanticipative operator and differential equations involving causal operators unify a variety of dynamic systems including ordinary differential equations [3], delay differential equations [3] and integro differential equations [4], to name a few.

Set differential equations [5] are useful in the study of multi-valued differential equations and multivalued differential inclusions. They include the theory of ordinary differential equations and ordinary differential systems as special cases.

Thus combining these two very general and fruitful areas of research will naturally result in a study that would encompass the study of many types of dynamic systems along with their special cases and that too in a semi-linear metric space.

Hence the study of set differential equations involving causal operators with memory was introduced in [11,7], where in the comparison theorems and local and global existence results including uniqueness were considered.

In [8] existence of extremal solutions and continuous dependence of solutions relative to initial data and a parameter for set differential equations involving causal operators with memory were studied. The monotone iterative technique was developed in [9]. Recently, the Euler solutions for integro differential equations have been considered in [6]. The Euler solutions for delay differential equations were dealt in [10].