



Multi-sensitivity with respect to a vector for semiflows

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Abstract

The notions of multi-sensitivity with respect to a vector, $\mathcal{N}$ -sensitivity and strong multi-sensitivity are introduced and studied on semiflows under the action of the most general possible semigroups. Using the concept of Furstenberg families, some other stronger forms of sensitivity are also studied. Moreover, all these notions are studied on hyperspaces and on the product of semiflows.

Keywords Semiflow · Sensitivity · Multi-sensitivity · Hyperspace

1 Introduction

In the past decade, significant study of dynamical systems under general semigroup actions has been done. Throughout the paper, by a semiflow we mean an action of a topological semigroup on a metric space. After the introduction of mathematical concept of chaos by Li and Yorke [7], the theory of chaos has seen major developments and it is still one of the important phenomena in the theory of semiflows, which is being widely investigated. Sensitive dependence on initial conditions, or sensitivity, is an important ingredient of chaos theory as it characterizes the unpredictability of a chaotic phenomenon. This notion was introduced by Auslander and Yorke [1], and later it was popularized by Devaney [3]. For measuring the strength of sensitivity, Moothathu [11] initiated a preliminary study of stronger forms of sensitivity. The author has introduced and studied three stronger forms of sensitivity, namely cofinite sensitivity, multi-sensitivity and syndetic sensitivity. In [13], Tan and Zhang have introduced a more general description of sensitivity via Furstenberg

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