



Devaney chaos and stronger forms of sensitivity on the product of semiflows

Rahul Thakur¹ · Ruchi Das¹

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Abstract

In this paper, we discuss transitivity and sensitivity problems on product of two semiflows. Further, we study various chaos related properties and stronger forms of sensitivity on the countably infinite product of semiflows under the action of the most general possible monoids. Examples are provided wherever necessary to support our results.

Keywords Semiflows · Sensitivity · Devaney chaos · Product maps

1 Introduction

In this paper, we give a positive answer to the Question 9.1 raised in [9] by improving the Proposition 3.10 stated as follows : Suppose T is a psp monoid. If (T, X, ϕ) is strongly mixing and (T, Y, ψ) has Touhey property, then $(T, X \times Y, \phi \times \psi)$ is topologically transitive. We also partially answer Question 9.2 [9] stated as follows : If $(T, X \times Y, \phi \times \psi)$ is syndetically sensitive (resp. cofinally sensitive; multisensitive), is one of the factors necessarily syndetically sensitive (resp. cofinally sensitive; multisensitive)?

Actions of topological monoids on metric spaces and uniform spaces are being studied extensively in recent years [3,6]. Chaos is an important phenomenon studied in theory of dynamical systems. In [7], Miller has obtained a characterization of Devaney chaoticity for a semiflow with an arbitrary acting abelian topological monoid. Devaney's definition of chaos consists of three conditions namely transitivity, dense

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✉ Ruchi Das
rdasmsu@gmail.com

Rahul Thakur
rahularya140@gmail.com

¹ Department of Mathematics, University of Delhi, Delhi 110007, India