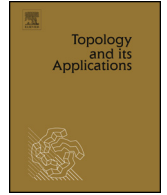




Contents lists available at ScienceDirect

Topology and its Applications

journal homepage: www.elsevier.com/locate/topol

Dynamic properties for the induced maps on symmetric product suspensions of a topological space

Franco Barragán^{a,*}, Sergio Macías^b, Anahí Rojas^c^a Instituto de Física y Matemáticas, Universidad Tecnológica de la Mixteca, Carretera a Acatlilma, K.M. 2.5, Huajuapán de León, 69000, Oaxaca, Mexico^b Instituto de Matemáticas, Universidad Nacional Autónoma de México, Circuito Exterior, Ciudad Universitaria, Ciudad de México, 04510, México, Mexico^c Instituto de Agroingeniería, Universidad del Papaloapan, Av. Ferrocarril, Ciudad Universitaria, Loma Bonita, 68400, Oaxaca, Mexico

ARTICLE INFO

Article history:

Received 4 April 2023

Received in revised form 25

September 2023

Accepted 5 December 2023

Available online xxxx

MSC:

54B20

37B02

54B15

54F15

54F16

37C25

Keywords:

Topological transitivity

Symmetric products

 n -fold symmetric products

suspension

Dynamical systems

ABSTRACT

Given a nondegenerate compact perfect and Hausdorff topological space X , $n \in \mathbb{N}$ and a function $f : X \rightarrow X$, we consider the n -fold symmetric product of X , $\mathcal{F}_n(X)$, and the induced function $\mathcal{F}_n(f) : \mathcal{F}_n(X) \rightarrow \mathcal{F}_n(X)$. In this paper, if $n \geq 2$, we begin the study of the n -fold symmetric product suspension of the topological space X , $\mathcal{SF}_n(X)$. We study the relationships between the following statements: (1) $f \in \mathcal{M}$, (2) $\mathcal{F}_n(f) \in \mathcal{M}$, and (3) $\mathcal{SF}_n(f) \in \mathcal{M}$, where \mathcal{M} is one of the following classes of maps: almost transitive, exact, mixing, transitive, totally transitive, strongly transitive, exactly Devaney chaotic, orbit-transitive, an F -system, scattering, TT_{++} , Touhey, backward minimal, totally minimal, Property P , strong property P or two-sided transitive.

© 2023 Elsevier B.V. All rights reserved.

1. Introduction

Given a continuum (nonempty compact, connected metric space) X and $n \in \mathbb{N}$, the n -fold symmetric product of X , $\mathcal{F}_n(X)$, consists of all nonempty subsets of X with at most n points, and it is originally defined in [1]. If $n \geq 2$, the n -fold symmetric product suspension of the continuum X , $\mathcal{SF}_n(X)$, defined as

* Corresponding author.

E-mail addresses: franco@mixteco.utm.mx (F. Barragán), sergiom@matem.unam.mx (S. Macías), arojas@unpa.edu.mx (A. Rojas).