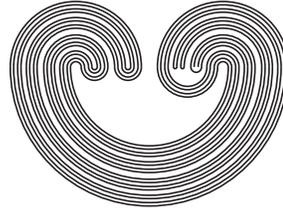


<http://topology.auburn.edu/tp/>

---

# TOPOLOGY PROCEEDINGS



Volume 48, 2016

Pages 309–325

---

<http://topology.nipissingu.ca/tp/>

## DYNAMICS ON LOCALLY COMPACT HAUSDORFF SPACES

by

M. ARCHANA, P. CHIRANJEEVI, AND V. KANNAN

Electronically published on February 5, 2016

**This file contains only the first page of the paper.** The full version of the paper is available to Topology Proceedings subscribers.

See <http://topology.auburn.edu/tp/subscriptioninfo.html> for information.

---

### Topology Proceedings

**Web:** <http://topology.auburn.edu/tp/>

**Mail:** Topology Proceedings

Department of Mathematics & Statistics

Auburn University, Alabama 36849, USA

**E-mail:** [topolog@auburn.edu](mailto:topolog@auburn.edu)

**ISSN:** (Online) 2331-1290, (Print) 0146-4124

COPYRIGHT © by Topology Proceedings. All rights reserved.

## DYNAMICS ON LOCALLY COMPACT HAUSDORFF SPACES

M. ARCHANA, P. CHIRANJEEVI, AND V. KANNAN

ABSTRACT. Given a metric space  $X$ , it is natural to ask, “Which subsets of  $X$  arise as sets of periodic points of continuous self-maps on  $X$ ?” Since most of the metric spaces have to contain a copy of  $\omega^2$ , the following results of this paper partially answer this question.

- (1) A subset  $S$  of  $\omega^2$  occurs as the set of periodic points for some continuous self-map on  $\omega^2$  if and only if  $\bar{S} \setminus S$  is either empty or infinite.
- (2) A subset  $S$  of  $\omega^2$  occurs as the set of periodic points for some self-homeomorphism on  $\omega^2$  if and only if  $T \cap S^c$  is either empty or infinite for any (minimal) subset  $T$  of  $\omega^2$  which is invariant under all those homeomorphisms under which  $S$  is invariant.
- (3) Every subset of  $\mathbb{N}$  occurs as set of periods of periodic points for some self-homeomorphism on  $\omega^2$ .

### 1. INTRODUCTION

There have been many papers characterizing the sets of periods of periodic points for various classes of self-maps, such as (i) continuous self-maps on the real line  $\mathbb{R}$  (see [8]), (ii) polynomials on  $\mathbb{C}$  (see [2]), (iii) toral automorphisms (see [13]), (iv) totally transitive maps on  $I$  (see [3]), (v) continuous self-maps of  $\mathbb{R}^n$  (see [12]), (vi) additive cellular automata (see [16]), (vii) linear operators (see [1]), and (viii) degree one maps on  $S^1$  (see [18]). Also, there have been some results giving partial information about the sets of periodic points for continuous self-maps on various sets (see

---

2010 *Mathematics Subject Classification.* 37C25.

*Key words and phrases.* ordinal number, periodic point.

The first author thanks UGC, India for financial support.

The second author thanks CSIR, India for financial support.

©2016 Topology Proceedings.

This file contains only the first page of the paper. The full version of the paper is available to Topology Proceedings subscribers. See <http://topology.auburn.edu/tp/subscriptioninfo.html> for information.