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by

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EXACT MAPS OF THE PSEUDO-ARC

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Abstract. In this paper, we provide a method of constructing a topologically exact map of the pseudo-arc using diagonal factor maps on the inverse limit space. Additionally, we give some criteria that guarantee when a topologically exact map of the pseudo-arc has infinite entropy.

1. Introduction

In this paper we construct a topologically exact map of the pseudo-arc. A *continuum* X is a compact connected metric space. A function $f : X \longrightarrow X$ is *(topologically) exact* if for every open set $U \subset X$ there exists $N = N_U$ such that $X = f^N(U)$. A *continuum* is a compact connected metric space. A continuum is *decomposable* if it is the union of two of its proper subcontinua. A continuum is *indecomposable* if it is not decomposable. Equivalently, a continuum is indecomposable if every proper subcontinuum is nowhere dense. A continuum is *arclike* if it is the inverse limit of arcs. The pseudo-arc is the only hereditarily indecomposable arclike continuum, Bing [3]. The pseudo-arc was first studied by Knaster [19], Moise [27], [28] and Bing [2], [3], [4], [5], but has continued to be an important research topic in continuum theory and dynamics since then.

The pseudo-arc is interesting for several reasons:

(1) It is homogeneous. [2]
(2) It is homeomorphic to all of its proper (non-degenerate) subcontinua. [27]
(3) Pseudo-arcs are "typical" in $\mathbb{R}^n$ $(n \geq 2)$ and in an infinite-dimensional separable Hilbert space. [3]

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