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# ENTROPY OF INDUCED DENDRITE HOMEOMORPHISM $C(f) : C(D) \to C(D)$

PALOMA HERNÁNDEZ AND HÉCTOR MÉNDEZ

Abstract. Let $f : D \to D$ be a dendrite homeomorphism. Let $C(D)$ denote the hyperspace of all subcontinua of $D$ endowed with the Hausdorff metric. Let $C(f) : C(D) \to C(D)$ be the induced homeomorphism in hyperspace $C(D)$. We show in this paper that the topological entropy of $C(f)$ has only two possible values: 0 or $\infty$. Also we show that the entropy of $C(f)$ is $\infty$ if and only if there exists a point $x \in D$ such that $x$ is not an element of the minimal subdendrite of $D$ that contains the union $\alpha(x, f) \cup \omega(x, f)$.

## 1. Introduction and Some Definitions

A *continuum* is a nonempty compact and connected metric space.

Let $X = (X, d)$ be a continuum. Let $2^X$ be the collection of all nonempty compact subsets of $X$ endowed with the Hausdorff metric $H_d$ induced by metric $d$. Each nonempty subset of $2^X$, with the corresponding restriction of $H_d$, is a *hyperspace*.

If $Y$ is a continuum and $Y \subset X$, then $Y$ is a *subcontinuum* of $X$. Let $C(X)$ denote the hyperspace of all subcontinua of $X$. Hyperspaces $2^X$ and $C(X)$ are continua as well; see [15].

A continuum $X$ is an *arc* if it is homeomorphic to the unit interval $[0, 1] \subset \mathbb{R}$, a *simple closed curve* provided that it is homeomorphic to the circle $S^1 = \left\{x^2 + y^2 = 1\right\} \subset \mathbb{R}^2$, a *graph* if it can be written as the union of finitely many arcs any two of which either are disjoint or intersect only in one or both of their end points, a *tree* if it is a graph which contains no

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