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Blockers on the pseudo-arc

by

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BLOCKERS ON THE PSEUDO-ARC

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Abstract. Let X be a continuum. Given disjoint nonempty closed subsets A and B of X, B *does not block* A provided that the union of subcontinua of X intersecting A but not intersecting B is dense in X. Answering a question by J. Bobok, P. Pyrih and B. Vejnar in this paper we prove that if P is the pseudo-arc, then there exists a nonempty closed subset D of P such that D blocks each finite set E contained in $P \setminus D$ but there exists a nonempty closed subset $G \subset P \setminus D$ such that D does not block G.

1. Introduction

A *continuum* is a compact connected non-degenerate metric space. A subcontinuum of a continuum is a nonempty closed connected subset, in particular, singletons are subcontinua. Given a continuum X, we consider the following hyperspaces.

$$2^X = \{A \subset X : A \text{ is closed and nonempty}\},$$
$$C(X) = \{A \in 2^X : A \text{ is connected}\},$$
$$F(X) = \{A \in 2^X : A \text{ is finite}\}.$$

All these hyperspaces are considered with the Hausdorff metric H.

Given $A, B \in 2^X$, we say that B *does not block* A if $A \cap B = \emptyset$ and the union of all subcontinua of X intersecting A and contained in $X \setminus B$ is dense in X. Given a subset $\mathcal{H} \subset 2^X$ we define

$$\mathcal{B}(\mathcal{H}) = \{B \in 2^X : B \text{ blocks each element of } \mathcal{H}\}.$$

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