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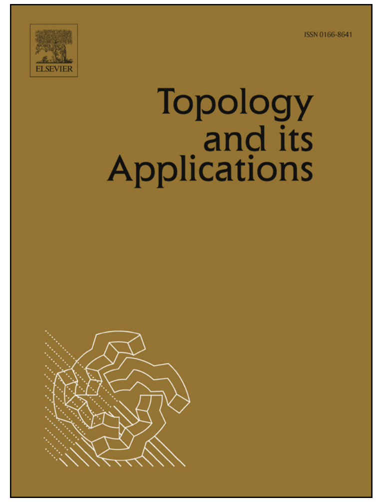

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The hyperspace $HS_m^n(X)$ for a finite graph X is unique

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Abstract

For a metric continuum X and a positive integer n, we consider the hyperspaces $C_n(X)$ (respectively, $F_n(X)$) of all nonempty closed subsets of X having at most n components (respectively, n points). Given positive integers n and m such that $n \geq m$, we define $HS_m^n(X)$ as the quotient space $C_n(X)/F_m(X)$ which is obtained from $C_n(X)$ by shrinking $F_m(X)$ to a point. In this paper we prove that if X is a finite graph and Y is a continuum such that $HS_m^n(X)$ is homeomorphic to $HS_m^n(Y)$, then X is homeomorphic to Y.

Keywords: continuum, hyperspace, hyperspace suspension, unique hyperspace
2010 MSC: 54B20, 54F15, 54B15

1. Introduction

A *continuum* is a nondegenerate compact connected metric space. Given a continuum X and a positive integer n, we consider the following hyperspaces of X:

$$\begin{aligned} 2^X &= \{A \subseteq X : A \text{ is a nonempty closed subset of } X\}, \\ C_n(X) &= \{A \in 2^X : A \text{ has at most } n \text{ components}\} \text{ and} \\ F_n(X) &= \{A \in 2^X : A \text{ has at most } n \text{ points}\}. \end{aligned}$$

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