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TOPOLOGY PROCEEDINGS

Volume 50, 2017

Pages 87–95

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by

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Electronically published on August 19, 2016

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Mail:	Topology Proceedings Department of Mathematics & Statistics Auburn University, Alabama 36849, USA
E-mail:	topolog@auburn.edu
ISSN:	(Online) 2331-1290, (Print) 0146-4124

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REALIZING FINITE TOPOLOGIES BY T-CLOSED EQUIVALENCE DECOMPOSITIONS

JAMES MAISSEN

Abstract. The set-valued function T is a well-established tool that aids in the classification of metric and Hausdorff continua. I answer in full a question by David Bellamy on which finite T_0 connected topologies can be realized as the T-closed equivalences of continua.

1. Introduction

At the 49$^{\text{th}}$ Spring Topology and Dynamics Conference, David P. Bellamy posed the following question:

> Given a finite connected T_0 space $\hat{X}$, is there a continuum X such that the T-closed equivalence decomposition of X is topologically equal to $\hat{X}$?

In this paper, the question is answered in the affirmative for all finite connected T_0 topologies.

2. Terms and Notation

In this paper, the term "continuum" will mean a non-degenerate compact, connected, Hausdorff space even though the continua actually constructed herein will all be metric continua. A continuum is *indecomposable* if it cannot be expressed as the union of two proper subcontinua. Let $\mathbb{N}$ denote the strictly positive integers. Given a compact space X, denote the hyperspace of compact subsets of X by 2^X and the power set

2010 *Mathematics Subject Classification.* Primary: 54F15, 54D10, 54C60. Secondary: 54D05, 54B15, 54C10, 54C50.

Key words and phrases. continuum neighborhoods, indecomposable continuum, set function T.

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