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TOPOLOGY PROCEEDINGS

Volume 50, 2017

Pages 97–100

http://topology.nipissingu.ca/tp/

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Electronically published on August 26, 2016

Topology Proceedings

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E-mail:	topolog@auburn.edu
ISSN:	(Online) 2331-1290, (Print) 0146-4124

http://topology.auburn.edu/tp/
http://topology.nipissingu.ca/tp/

TOPOLOGY PROCEEDINGS
Volume 50 (2017)
Pages 97-100

E-Published on August 26, 2016

ATOMIC MAPS AND $\mathcal{T}$-CLOSED SETS

SERGIO MACÍAS

In Memoriam Ms. Isabel Caravaca

Abstract. We give a partial answer to a question by David P. Bellamy, Leobardo Fernández, and Sergio Macías by showing that if $f\colon X \twoheadrightarrow Y$ is an atomic map between continua, then the cardinality of the $\mathcal{T}$-closed sets of X is equal to the cardinality of the $\mathcal{T}$-closed sets of Y. We present an example showing that the converse implication is not true.

1. Introduction

$\mathcal{T}$-closed sets have been considered by several authors (see for example [2] and [8]), the first study of the properties of this type of sets is in [1]. We present a partial answer to [1, Question 3.18] by showing that if $f\colon X \twoheadrightarrow Y$ is an atomic map between continua, then the cardinality of the $\mathcal{T}$-closed sets of X is equal to the cardinality of the $\mathcal{T}$-closed sets of Y (Theorem 3.6). We present an example showing that the converse implication is not true (Example 3.7). We also extend [1, Theorem 4.12] to atomic maps between continua (Corollary 3.8).

2. Definitions

If Z is a metric space, then given a subset A of Z, the interior of A is denoted by $Int_Z(A)$ and the boundary of A is denoted by $Bd_Z(A)$. A *map* is a continuous function.

A *continuum* is a compact, connected, metric space. A continuum is *decomposable* if it is the union of two of its proper subcontinua. A

2010 *Mathematics Subject Classification.* Primary 54B20; 54C60.

Key words and phrases. atomic map, continuum, monotone map, set function $\mathcal{T}$, $\mathcal{T}$-closed set.