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

TOPOLOGY
PROCEEDINGS

Volume 57, 2021

Pages 15–24

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

Hereditarily indecomposable subcontinua of the product of two Hausdorff arcs are metric

by

Michel Smith

Electronically published on April 29, 2020

Topology Proceedings

Web:	http://topology.auburn.edu/tp/
Mail:	Topology Proceedings Department of Mathematics & Statistics Auburn University, Alabama 36849, USA
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 57 (2021)
Pages 15-24

E-Published on April 29, 2020

HEREDITARILY INDECOMPOSABLE SUBCONTINUA OF THE PRODUCT OF TWO HAUSDORFF ARCS ARE METRIC

MICHEL SMITH

Abstract. We show that if each of A and B is a Hausdorff arc, then every hereditarily indecomposable subcontinuum of $A \times B$ is a planar metric continuum.

1. Introduction

The author is interested in a generalization of Bing's result to non-metric spaces concerning the existence of hereditarily indecomposable continua in higher dimensional continua [1]. He showed that there exist non-metric continua arbitrary products of which do not contain non-degenerate hereditarily indecomposable continua. On the other hand in the case of a disc $[0,1] \times [0,1]$ there are lots of hereditarily indecomposable continua contained therein. In [8] and [9] the author showed that for a Hausdoff arc X that any hereditarily indecomposable subcontinua of $X \times X$ must be metric in the case where X is a long line type of arc and the case where X is a Souslin line respectively. Furthermore this results for the lexicographic arc follows from the stronger result of Greiwe, Smith and Stone [4]. Thus it appears that in certain non-metric spaces adding the condition of hereditary indecomposability on subcontinua of the space yields metric continua. In general one would think that the condition of hereditary indecomposability would have nothing to do with metrizability, but indeed it does as these results show.

2010 *Mathematics Subject Classification.* Primary 54F15, 54D35; Secondary 54B20.

Key words and phrases. Continua, indecomposable continua, hereditarily indecomposable continua, Hausdorff spaces.