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Publication date
2022

Published in
Topology Proceedings

Citation (APA)
Dow, A., & Hart, K. P. (2022). All Parovichenko spaces may be soft-Parovichenko. *Topology Proceedings*, *59*, 209-221.

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TOPOLOGY PROCEEDINGS

Volume 59, 2022

Pages 209–221

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by

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Electronically published on May 17, 2021

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Topology Proceedings

Web:	http://topology.nipissingu.ca/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

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E-Published on May 17, 2021

ALL PAROVICHENKO SPACES MAY BE SOFT-PAROVICHENKO

ALAN DOW AND KLAAS PIETER HART

To the memory of Phil Zenor, one of the founders of this journal

Abstract. It is shown that, assuming the Continuum Hypothesis, every compact Hausdorff space of weight at most $\mathfrak{c}$ is a remainder in a soft compactification of $\mathbb{N}$.

We also exhibit an example of a compact space of weight $\aleph_1$ — hence a remainder in some compactification of $\mathbb{N}$ — for which it is consistent that is not the remainder in a soft compactification of $\mathbb{N}$.

Introduction

A compactification, $\gamma\mathbb{N}$, of the discrete space $\mathbb{N}$ of natural numbers is said to be *soft* if for all pairs $\langle A, B\rangle$ of disjoint subsets of $\mathbb{N}$ the following holds: if $\operatorname{cl} A \cap \operatorname{cl} B \neq \emptyset$ then there is an autohomeomorphism h of $\gamma\mathbb{N}$ such that $h[A] \cap B$ is infinite and h is the identity on the remainder $\gamma\mathbb{N} \setminus \mathbb{N}$.

Banakh asked in [1] whether every Parovichenko space is soft-Parovichenko, where a Parovichenko space is defined to be a remainder in some compactification of $\mathbb{N}$ and, naturally, a soft-Parovichenko space is a remainder in some soft compactification of $\mathbb{N}$. Parovichenko's classic theorem, from [7], characterizes, assuming CH, the Parovichenko spaces as the compact Hausdorff spaces of weight at most $\mathfrak{c}$.

2010 *Mathematics Subject Classification.* Primary 54D40; Secondary 03E35, 03E50, 54A35, 54D80.

Key words and phrases. compactification, soft compactification, Parovichenko spaces, Continuum Hypothesis.

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