

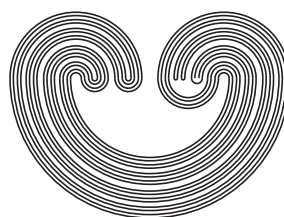
---

# TOPOLOGY PROCEEDINGS

Volume 63, 2024

Pages 103–106

---



## OPEN DIAMETER MAPS ON SUSPENSIONS

by

HUSSAM ABOBAKER, WŁODZIMIERZ J. CHARATONIK AND  
ROBERT P. ROE

Electronically published on August 26, 2023

This file contains only the first page of the paper. The full version of the paper is available to Topology Proceedings subscribers. See <http://topology.nipissingu.ca/tp/subscriptioninfo.html> for information.

---

### 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](mailto:topolog@auburn.edu)

**ISSN:** (Online) 2331-1290, (Print) 0146-4124

COPYRIGHT © by Topology Proceedings. All rights reserved.



## OPEN DIAMETER MAPS ON SUSPENSIONS

HUSSAM ABOBAKER, WŁODZIMIERZ J. CHARATONIK,  
AND ROBERT P. ROE

**ABSTRACT.** It is shown that if  $X$  is a metric continuum, which admits an open diameter map, then the suspension of  $X$ , admits an open diameter map. As a corollary, we have that all spheres admit open diameter maps.

### 1. INTRODUCTION

A diameter map is a continuous function from the hyperspace of non-empty closed subsets of a compact metric space into the non-negative reals that assigns to each closed set of the space the diameter of the set. The properties of the diameter map strongly depend on the metric. In [3], Nadler asked if there exists a metric for the circle that admits an open diameter map. He also asked to characterize the spaces that admit open diameter maps. In [2, Theorem 5.5], it is shown, among other things, that the suspension of a finite discrete space admits an open diameter map. Since a circle is the suspension of a two-point set, this shows that a circle admits open diameter mappings. Continuing on this topic, it is shown in [1] that any finite connected graph admits an open diameter map. In [2, Problem 5.10], it is asked if a suspension of any compact metric space (continuum) admits an open diameter map and, in particular, if  $n$ -dimensional spheres admit open diameter maps. In this note, the authors use a modified version of the metric in [2, Theorem 5.5] to show that if  $X$  is a continuum, which admits an open diameter map,

---

2020 *Mathematics Subject Classification.* 54B20, 54C10, 54F15, 54F16.

*Key words and phrases.* diameter, open maps, hyperspaces.

©2023 Topology Proceedings.

This file contains only the first page of the paper. The full version of the paper is available to Topology Proceedings subscribers. See <http://topology.nipissingu.ca/tp/subscriptioninfo.html> for information.