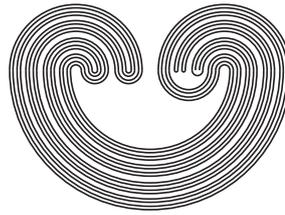


<http://topology.nipissingu.ca/tp/>

TOPOLOGY PROCEEDINGS



Volume 67, 2026

Pages 125–141

IRREDUCIBILITY ON MONOTONICALLY NORMAL SPACES AND GO-SPACES

by

YASUSHI HIRATA AND YUKINOBU YAJIMA

Electronically published on July 28, 2025

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

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

COPYRIGHT © by Topology Proceedings. All rights reserved.

IRREDUCIBILITY ON MONOTONICALLY NORMAL SPACES AND GO-SPACES

YASUSHI HIRATA AND YUKINOBU YAJIMA

ABSTRACT. We first present a characterization for the irreducibility of monotonically normal spaces. Making use of it, we proceed another characterization for the irreducibility of GO-spaces. Next, we discuss when GO-spaces have an irreducible subspace which is not D . As a result, we give a characterization for GO-spaces which have a closed irreducible subspace being not D .

1. INTRODUCTION

The study of D -spaces has been advanced by many mathematicians since around 2000. The concept was first introduced by van Douwen in [8]. However, a substantial start seems to be the theorem of van Douwen and Lutzer [7] in 1997. Combining a classical result of Engelking and Lutzer [9], it is stated as follows.

Theorem 1.1. *For a GO-space X , the following are equivalent.*

- (a) X is paracompact.
- (b) X is weakly submetalindelöf.
- (c) There is no closed subspace in X homeomorphic to a stationary subset in a regular uncountable cardinal.
- (d) X is a D -space.

2020 *Mathematics Subject Classification.* 54A25, 54D15, 54D20, 54F05.

Key words and phrases. Irreducible, monotonically normal, GO-space, D -space, extent, Lindelöf degree.

This research was supported by Grant-in-Aid for Scientific Research (C) 23K03206.

©2025 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.