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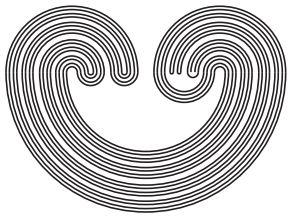

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by

Gary Gruenhage, Strashimir G. Popvassilev, and John E. Porter

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MONOTONE ORTHOCOMPACTNESS AND PROPERTY $(\mathbf{A}_o)$

GARY GRUENHAGE, STRASHIMIR G. POPVASSILEV, AND JOHN E. PORTER

Dedicated to the memory of Phillip L. Zenor, our dear colleague, teacher, and friend, with appreciation for his kindness, good cheer, and willingness to always discuss mathematical ideas.

Abstract. We continue the study of monotonic orthocompactness with respect to interior preserving open refinements (abbreviated MO_o) introduced by Popvassilev and Porter. We show that a GO-space is MO_o provided that it contains a σ-closed-discrete set D such that the complement of its closure is MO_o; in particular, Alexandrov's double arrow space as well as the lexicographically ordered square are MO_o. Hence the result of Chase and Gruenhage that compact Hausdorff spaces which are monotonically (countably) metacompact must be metrizable does not extend to MO_o. We show that a compact LOTS which is MO_o must be first countable, and a monotonically normal space which is MO_o must be hereditarily paracompact. We also introduce a formally weaker property (A_o) as a useful tool in this study. We show that the one-point compactification of an uncountable discrete space, the Alexandrov duplicate of the unit interval, and stationary subsets of regular uncountable cardinals do not have property (A_o) and hence are not MO_o.

1. Introduction

All spaces considered are assumed to be at least T_2. A space X is *orthocompact* if every open cover $\mathcal{U}$ has an interior-preserving open refinement $\mathcal{V}$ (i.e., $\cap\mathcal{W}$ is open for each $\mathcal{W} \subset \mathcal{V}$). It is equivalent to say that there is

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Key words and phrases. Monotone covering properties, compact, paracompact, orthocompact, monotone orthocompact, property (A_o), GO-spaces, LOTS, σ-closed-discrete dense subset, metrization, stationary sets.

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