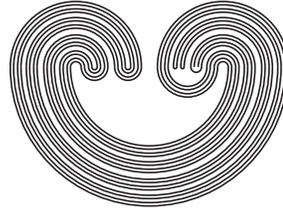


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DESTRUCTION OF METRIZABILITY IN GENERALIZED INVERSE LIMITS

by

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DESTRUCTION OF METRIZABILITY IN GENERALIZED INVERSE LIMITS

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ABSTRACT. If X is a compact Hausdorff space, an upper semi-continuous bonding function $f : X \rightarrow 2^X$ is said to be idempotent if $f^2 = f$. In this short paper, we prove that if $f : [0, 1] \rightarrow C([0, 1])$ is u.s.c., idempotent, and surjective, but f is not the identity, then the inverse limit with the single bonding function f and with factor spaces indexed by a nonzero ordinal κ contains a copy of $\kappa + 1$. It follows that such an inverse limit is only metric in the case where the index set κ is countable.

1. INTRODUCTION

As various recent papers have shown (e.g., [2], [10], [11]), continuum theorists have begun to broaden their study of generalized inverse limits to the case where the factor spaces are indexed by sets other than the positive integers. This more inclusive approach opens many new avenues for research, and has already produced some interesting results. For example, R. Patrick Vernon [11] showed that an inverse limit indexed by the set of all integers with a single upper semi-continuous bonding function can be homeomorphic to a 2-cell, whereas Van Nall [8] previously showed this is impossible for such an inverse limit indexed by the positive integers alone.

In another recent paper, Scott Varagona [10] generalized many previously known theorems (e.g., from [6] and [9]) to the case of u.s.c. inverse limits indexed by arbitrary totally ordered sets. As he showed, in that context, inverse limits with a single idempotent upper semi-continuous

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