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COMPACTIFICATIONS AND PROPERTY OF KELLEY IN GENERALIZED INVERSE LIMITS

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To the memory of Phil Zenor: A fine mathematician who enjoyed a full life and who brightened the lives of those around him.

Abstract. In 1969, R. Bennett gave conditions on a continuous function $f : [0,1] \to [0,1]$ so the inverse limit X with fixed bonding map f is the compactification of a ray. Mahavier in 2004 relaxed the continuity assumption on f to upper semicontinuous and continuum-valued to show X is a compactification of a connected set R. We generalize Mahavier's result and give necessary and sufficient conditions for R to be a ray. We also give conditions so X has the property of Kelley if $X \setminus R$ does. These results partially answer questions posed by W. T. Ingram in 2012.

1. Introduction

Inverse systems of combinatorially simple spaces with a fixed continuous bonding map have a long history in topology and dynamics. Such systems are, however, still very far from being well-understood.

In the last twenty years generalized inverse systems with upper semicontinuous, set-valued, bonding functions have come to prominence. Many theorems for classical inverse systems fail to extend to such generalized systems.

In 1969, Bennett [1] gave a construction of an inverse sequence of arcs with a fixed continuous bonding map $f : [0,1] \to [0,1]$ such that the inverse limit is the compactification of a topological ray. In 2004, Mahavier, [11, Theorem. 7, p. 230], replaced Bennett's bonding map with

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