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by

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CHAINABILITY OF INVERSE LIMITS ON $[0,1]$ WITH INTERVAL-VALUED FUNCTIONS

W. T. INGRAM AND M. M. MARSH

Abstract. We provide sufficient conditions for the inverse limit of an inverse sequence on $[0,1]$ with upper semi-continuous set-valued bonding functions to be chainable. The conditions are placed on the bonding functions. Our results answer several questions of W. T. Ingram. We also show that analogous conditions placed on the inverses of the bonding functions produce a chainable inverse limit.

1. Introduction

In the setting of inverse sequences on $[0,1]$ with upper semi-continuous set-valued bonding functions, we provide sufficient conditions for chainability of the inverse limit space. The conditions are properties placed on the bonding functions. Our main theorems (Theorem 4.1 and Theorem 5.3) give two related solutions to a generalized version of W. T. Ingram's Problem 1.1 in [2], and Corollary 4.3 gives an answer to Ingram's Problem 4.4 in [4]. Our results generalize Ingram's Theorem 4.3 [4], and the results, related to chainability of inverse limits on $[0,1]$, of a talk given by Faruq Mena at the Spring Topology and Dynamics Conference held at the University of Alabama, Birmingham, in March 2019.

Additionally, in the more general setting of upper semi-continuous set-valued functions on compacta, we prove a number of lemmas and theorems

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Key words and phrases. C-set-valued function, chainable, inverse limit.

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