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SOME THEOREMS ON INVERSE LIMITS WITH MONOTONE UPPER SEMI-CONTINUOUS BONDING FUNCTIONS

YOSHIYUKI OSHIMA

Abstract. In [Duke Math. J. 21 (1954), pp. 233–245], C. E. Capel showed that local connectedness of factor spaces is inherited by the inverse limits with surjective monotone bonding maps. Also, in [Topology Appl. 285 (2020), 107393, 25 pp.], Benjamin Espinoza and Eiichi Matsuhashi showed that n-aposyndesis, semi-aposyndesis, continuum-chainability, Wilderness, being D, being D^*, and co-local connectedness are preserved under inverse limits with surjective monotone bonding maps. On the other hand, in [Topology Appl. 228 (2017), pp. 486–500], James P. Kelly, showed that inverse limits of arcs with surjective monotone upper semi-continuous bonding functions are locally connected. In this paper, we investigate the set-valued versions of the above results by Espinoza and Matsuhashi.

1. Introduction

A compact metric space is called a *compactum* and *continuum* means a connected compactum. If X is a compactum, 2^X denotes the space of all closed subsets of X with the topology generated by the Hausdorff metric.

A continuum X is said to be *decomposable* if there exist two proper subcontinua A and B of X such that $X = A \cup B$. A continuum is *indecomposable* if it is not decomposable.

For a subset A of a metric space (X, d), we denote the interior of A in X by $\mathrm{Int}_X A$, the closure of A in X by $\mathrm{Cl}_X A$, and $\sup\{d(x, y) \mid x, y \in A\}$ by $\mathrm{diam} A$. Also, for a family $\mathscr{B}$ of subsets of X, we denote $\sup\{\mathrm{diam} B \mid B \in$

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