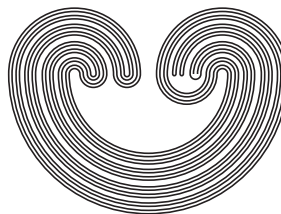


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Π_2^0 SUBSETS OF DOMAIN-COMPLETE SPACES AND COUNTABLY CORRELATED SPACES

by

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Π_2^0 SUBSETS OF DOMAIN-COMPLETE SPACES AND COUNTABLY CORRELATED SPACES

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ABSTRACT. We show that every Π_2^0 subset of a domain-complete space is domain-complete. This implies that Ruiyuan Chen's countably correlated spaces are all domain-complete (see *Notes on quasi-Polish spaces*. Available at arXiv:1809.07440v1 [math.LO]).

1. INTRODUCTION

A *domain-complete space* is a space homeomorphic to a G_δ subset of a continuous dcpo. Those spaces were introduced in [4] and contain all continuous dcpos; all of Matthew de Brecht's quasi-Polish spaces [3], in particular, all Polish spaces; all continuous complete quasi-metric spaces in their d -Scott topology; and, in particular, all completely metrizable spaces.

The following is mentioned in [4, p. 33] as open problem (v): Is every subspace obtained as a Π_2^0 subset of a domain-complete space again domain-complete? We give a positive answer to this problem here, where we also solve open problems (vi) and (vii) of the same paper, as we will see at the end of this paper.

2. PRELIMINARIES

A *dcpo* is a poset in which every directed family D has a supremum $\sup^\uparrow D$. The *way-below* relation \ll on a dcpo Y is defined by $x \ll y$ if and only if every directed family D such that $y \leq \sup^\uparrow D$ contains an element above x . The following relations hold: $x \ll y$ implies $x \leq y$; $x \leq y \ll z$

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Key words and phrases. Π_2^0 subset, countably correlated space, domain-complete space.

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