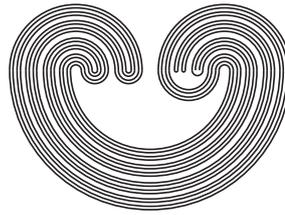


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ON CHARMING SPACES AND SOME RELATED SUBCLASSES

by

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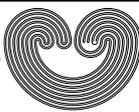
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ON CHARMING SPACES AND SOME RELATED SUBCLASSES

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ABSTRACT. The class of charming spaces was introduced by A.V. Arhangel'skii in [Remainders of metrizable spaces and a generalization of Lindelöf Σ -spaces, *Fund. Math.*, 215 (2011), 87–100]. The purpose of this paper is to show some relevant properties of this new class of topological spaces. We present generalizations to some results of V. V. Tkachuk related to the lifting of topological properties. Also we show that for every \aleph_0 -bounded topological group G , G is a Lindelöf Σ -space iff G is a $(\mathcal{K}, L\Sigma)$ -structured space. As a consequence we prove that, for every Tychonoff space X , the function space $C_p(X)$ is Lindelöf- Σ if and only if is $(\mathcal{K}, L\Sigma)$ -structured, and that, for X compact, $C_p(X)$ is Lindelöf- Σ if and only if $C_p(X)$ is $(L\Sigma, L\Sigma)$ -structured.

1. INTRODUCTION

In this paper we study the class of charming spaces. The class of charming spaces (or $(L\Sigma, L\Sigma)$ -structured spaces) was introduced by A. V. Arhangel'skii in [1] as an extension of the class of Lindelöf Σ -spaces. Our “basic conjecture” is that many results in the class of the Lindelöf Σ -spaces, can be “transformed” into results in this new class of spaces or some intermediate class between the class of Lindelöf Σ -spaces and the $(L\Sigma, L\Sigma)$ -structured spaces.

Among other things, we prove that the class of $(L\Sigma, L\Sigma)$ -structured spaces has nice categorical properties. For example, we prove that this class is closed under countable unions, closed subspaces and continuous images.

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Key words and phrases. Charming spaces, Topological Function Spaces, Lindelöf- Σ spaces, monotonically monolithic spaces, Collins-Roscoe property.

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